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INTERNATIONAL MONETARY FUND

Minutes of Executive Board Seminar 84/3

3:00 p.m., April 23, 1984

J. de Larosière, Chairman
W. B. Dale, Deputy Managing Director

Executive Directors	Alternate Executive Directors
	J.-C. Obame, Temporary
	G. Ercel, Temporary
	G. E. L. Nguyen, Temporary
	M. A. Weitz, Temporary
R. D. Erb	
	S. R. Abiad, Temporary
T. Hirao	T. Yamashita
J. E. Ismael	
	D. I. S. Shaw, Temporary
A. Kafka	
G. Laske	G. Grosche
	I. Angeloni, Temporary
R. N. Malhotra	
	J. E. Suraisry
	T. de Vries
	K. G. Morrell
	A. A. Agah, Temporary
	M. Camara, Temporary
	J. L. Feito
	A. K. Juusela, Temporary
	T. A. Clark
	Wang E.

L. Van Houtven, Secretary
J. C. Corr, Assistant

Also Present

Administration Department: T. Cole, A. Coune, P. Hirschfeldt, J. D. Huddleston, J. B. Kaiser, M. M. Moore, H. J. O. Struckmeyer. European Department: D. A. Brodsky. Exchange and Trade Relations Department: S. Mookerjee, Deputy Director. External Relations Department: A. F. Mohammed, Director; H. O. Hartmann. Legal Department: J. G. Evans, Jr., Deputy General Counsel, Research Department: R. R. Rhomberg, Deputy Director. Secretary's Department: J. W. Lang, Jr., Deputy Secretary; A. Wright, Deputy Secretary; B. R. Hughes. Treasurer's Department: R. Noë, J. V. Soromenho-Ramos. Bureau of Computing Services: W. M. Minami, Director; N. S. Arya, M. E. Kepner, R. L. Kline. Bureau of Statistics: J. B. McLenaghan, C. A. Patel. Internal Auditor: J. R. Hamilton. Personal Assistant to the Managing Director: S. P. Collins. Advisors to Executive Directors: H. A. Arias, S. El-Khouri, Y. Okubo, D. C. Templeman. Assistants to Executive Directors: V. Govindarajan, A. K. Juusela, H. Kobayashi, A. Koné, M. Rasyid, A. A. Scholten, Shao Z., S. Sornyanyontr, J. C. Williams, A. Yasseri.

1. ELECTRONIC DATA PROCESSING IN THE FUND

The Executive Directors held a seminar to consider a staff paper on electronic data processing in the Fund (EBAP/84/76, 4/17/84).

The Director of the Bureau of Computing Services remarked that the commercial use of computers had begun in the early 1960s. At that time, the range of applications had been limited because hardware had been extremely expensive. Initially, the applications had included computation of statistics, large-scale mathematical programs, and, later, accounting. Because the use of computers had been limited to selected areas, major companies had created "islands of automation" within their organization, with each island designed very efficiently from its own perspective.

The 1970s had seen the emergence of centralized computer organizations aimed at pooling resources, the Director continued. Computing had been so expensive that many users or departments had had to cooperate to finance the purchase of a computer, which in the early 1960s might have cost $2,000 an hour to rent (in 1962 dollars). The centralized organizations had been reponsible for the development of management policies, standards, budgets, and the like, with regard to the entire computing function of the firm or institution. At the same time, the pace of technological change had increased rapidly; for example, about every three years a vendor would put on the market a completely new system that required modifications, conversions, and upgrading of existing equipment.

A shift toward integration of systems had begun in the late 1970s, the Director observed, as it had become necessary for the different "islands of automation" to communicate with one another. For example, a computer might have been designed specifically to deal with the company's payroll from the point of view of the comptroller's office, while a separate system handled employee information for the administration department. As it had become necessary to share information between the two systems, to build databases on which the two could operate, a complete restructuring of systems had been undertaken. At that time, the use of minicomputers had begun to grow, an indication of the change in the economics of computing.

The history of computing services in the Fund was similar to that in industry as a whole, the Director commented. The initial data center had been set up in the late 1960s, with the first applications being focused on accounting and on statistics and economic data. Each application had been efficiently, albeit narrowly, designed in line with the "islands of automation" principle. Because of the high cost of hardware and the consequent need to take advantage of economies of scale, the Fund's first computers had been financed in cooperation with the World Bank. During the 1970s, the growth of computing services had been slow but steady, as indicated in Chart I of EBAP/84/76. Indeed, the percentage of expenditure on computing services had remained relatively constant, whereas in most organizations it had tended to grow rapidly at that time. Nevertheless,

despite the relatively slow rate of growth in the past 15 years, many of the Fund's critical day-to-day operations were now computerized and could no longer be carried out without the use of computers.

The Fund and the Bank had initially chosen a mainframe computer built by a firm that had sought to develop its products in isolation from the data processing industry as a whole, the Director recalled. The first minicomputers in the Fund had been purchased in the late 1970s; currently the Fund owned three. The data center had continued to be shared with the World Bank, although the Bank had moved its computers to a separate location from the Fund's in 1983. In 1982, the Executive Committee for Computing Services (ECCS) had been formed, a major step in the management of data processing technology in the Fund. For the first time, it had been possible to develop a Fund-wide perspective for planning the strategic development of data processing facilities and for the budget and control of expenditures at the project level. The Bureau of Computing Services had also been formed in 1982.

The first mission of the Bureau of Computing Services was to support and to improve the data and analytical tools used in decision making by the Fund, the Director stated. A second objective was to contain the rate of growth of expenditures on personnel and other items through the application of data processing technology. Third, it was the responsibility of the Bureau to advise the management of the Fund and the Executive Board on the appropriate application of technology as new systems emerged.

Commenting on the current status of data processing services in the Fund, the Director noted that, while many of the systems in operation had been designed efficiently for their specific purposes, changing requirements had resulted in reductions in overall efficiency through the emergence of redundant data and the inability of different systems to communicate with one another. Nevertheless, in applications where the requirements had remained relatively unchanged, the systems operated in a highly satisfactory manner. In general, the major systems were between seven and ten years old. Their design had been based on the high cost of hardware and did not take into account the most current developments in new computer technology. Because the systems could not communicate with each other and were being asked to meet changing needs, it had been necessary to modify them, bringing about more complex systems that were less efficient and less flexible. Consequently, it had become increasingly difficult to maintain the overall system.

However, improvements had been made in the management of data processing within the Fund through, for example, the development of multiyear plans, the Director observed. The Treasurer's Department had a five-year plan, and the process was being extended to other departments. It had also been possible to develop a Fund-wide perspective on priorities at the project level and to control expenditures at that level. In addition, training programs were being developed to improve the skills of Fund staff members who dealt with computers, a necessary action because the existing systems had dated architecture and limited capacity. "Dated architecture"

meant that both the space available for applications in the computer and its speed of operation were limited. Sometimes a user might have to wait several minutes for a response that could be provided in seconds with up-to-date equipment.

In addition to the major systems, the Director went on, the Fund had minicomputers built for specific purposes. Generally they operated efficiently in their isolated applications; the computer that handled the requirements of the Joint Library was a good example. However, the current location of the Fund's computers, on the concourse level of the headquarters building, was environmentally unacceptable. The old wiring under the floors had never been removed, making it almost impossible to install new wiring for additional equipment without the risk of bringing down the whole system. A further risk was water damage. Some years ago, several million dollars of water damage had occurred and, although the risk had been minimized, it remained. In the long run, the major constraint was the amount of space available. The existing data center simply could not accommodate the Fund's long-term requirements. In the area of software, it was no longer necessary for systems to be designed in-house. The changing economics of software development meant that most systems could be purchased efficiently from commercial developers of software.

A number of current trends in the computer industry deserved consideration, the Director suggested. First, the cost of computing on a per-unit basis was declining. A computer that had cost $2,000 an hour to rent in 1962 might have had 16,000 units of computing capacity. Today, a personal computer with 48,000 units of capacity could be bought for less than $1,000. However, although the cost per unit of capacity was falling, the total cost was not, because of the growing computing needs for newer and more sophisticated applications.

The cost of telecommunications was also going down, the Director observed. Recently, the staff had conducted an experiment in which a microcomputer taken on a staff mission to Asia had communicated with data processing equipment at Fund headquarters. Although the system was not yet ready to be used on a wide scale, it represented an advance that would not have been possible either technically or financially a decade earlier. On the other hand, the cost of data processing personnel was rising. Because systems were becoming more complex, the skill requirements to operate them were increasing; consequently, it was becoming more economical to purchase database and software systems from outside organizations than to develop them in-house. Finally, there was a trend toward compatible systems. Ten years earlier, antitrust action had been initiated in the United States against a large vendor of computers with the aim of increasing competition. Although the market share of that vendor had declined, its influence in the industry had increased because almost every other vendor had sought to build systems that were compatible so as to share in the market. A major advantage was the increase in the number of vendors from which equipment could be purchased while price competition had intensified. However, the manufacturer of the Fund's older equipment had chosen a different strategy, losing market share and becoming isolated

from the trend toward compatibility. Therefore, it would be necessary for the Fund to make a significant move in the direction of compatible systems so that it could take advantage of improved software and better prices for hardware.

The Bureau of Computing Services had developed four major programs aimed at improving its ability to service the needs of Fund staff and management, the Director noted. First, in the area of administration, the Bureau would continue its efforts to develop multiyear plans and budget projections and to control expenditure at the project level on a multiyear basis.

Second, with regard to applications, the Director went on, obsolete systems would be redesigned and new systems would be developed with the current technology. A new database of statistical information was being developed to improve the speed and accuracy of data retrieval and analysis for the benefit of those who had to reach the Fund's decisions. The system previously in use had been designed more for publication purposes, whereas the new system could be categorized as a decision-support system. In the financial area, a new system was being developed to replace the existing system, which was seven to ten years old. Without such a change, the ability of the Fund to maintain a viable transactions base would be at risk in the long term. In the administrative area, two computers were being placed in the Cable Room to handle increased traffic and to enable transactions to continue even if one of the computers should break down. Other administrative applications were being developed with regard to procurement, budgeting, and the like. Each would be justified on the basis of its financial payback. In office automation, efforts were being directed at improving the process of analysis and the production of papers in support of Fund decisions through better communication among front offices of the departments and the economists working on the papers.

A third major program was aimed at improving the production systems, of which there were at present between 50 and 100 in the Fund, the Director added. Because of the scale of modifications that had been made hitherto, many of those systems were in need of streamlining. The improvements were aimed at reducing the skill level needed to run the systems, thereby lowering labor costs.

The fourth program was directed at improving the technology base, the Director said. It included upgrading the skills of staff members through training, by having them work on relevant applications and with knowledgeable computer specialists. There would also be a move toward purchasing more software rather than developing it in-house. It was estimated that purchase of the new economic information system would save about $1.1 million over three years relative to the cost of having it built by Fund staff. There would also be increasing purchases of compatible hardware so that the office automation functions, the microcomputers, the large computers, and the Cable Room could be integrated into an overall system.

Finally, a paper would be circulated shortly requesting the Executive Board to approve financing of a new Fund center for electronic data processing (EDP) to safeguard the whole system, the Director of the Bureau of Computing Services stated. The product of the Fund's efforts could be translated most of the time into various pieces of information such as a decision, the transmittal of advice, a discussion, or a publication. Directors were being requested to consider the appropriate level of investment in the technology needed to improve the handling of such information.

Mr. de Vries commented that a computer was, in a sense, little more than a sophisticated calculating machine capable of producing a great deal of information at a rapid rate. However, it was not clear to what degree that ability would improve decision making. Sometimes, too much information was as bad as too little.

The remark by the Director of the Bureau of Computing Services that the Fund was moving from "a publication-oriented system" to a "decision-support system" was unclear, Mr. de Vries continued. It would also be useful to learn more about the training needs of staff because it would be important to ensure that all staff members were adequately skilled in the use of computers.

The Director of the Bureau of Computing Services explained that, while a computer could never make a decision, it could improve the decision-making process in a number of ways. It could more speedily provide the information necessary for the decision; it could improve the accuracy of the underlying information; it could improve the quality of the data; and it could allow more sophisticated manipulation of the data. For example, on a recent mission the staff had been able to test alternative hypotheses and put together various scenarios, thereby improving the basis on which they could make decisions. Thus, the use of a microcomputer had improved the staff's analysis and aided its discussions with the authorities. Further characteristics of the computer were that it could store much more information than a calculator and could assist in communications. The information could be transferred rapidly from one location to another.

The Deputy Managing Director commented that because a computer could calculate so rapidly, there were times when some analyses could be undertaken that would otherwise not be undertaken because of the time and effort involved. On a recent staff mission, the staff had been able to provide, with the help of a microcomputer, medium-term debt projections in the course of a two-week mission. By testing alternative hypotheses against different variables, the staff had been able to provide the authorities in question with an understanding of their debt position that they had not previously had.

Mr. de Vries asked what plans there were to enable the staff to adapt its skills to the new technologies in order to use them most effectively.

The Director of the Bureau of Computing Services replied that some training would be provided with the help of consultants, particularly for projects involving very new technology. In one project already under way, the consultant was training some of the most capable Fund staff members in order to enable them to train other staff members. A principal aim of the Bureau was to provide training on an as-needed basis, as new projects were undertaken.

Mr. de Vries asked what the Fund's major needs were in terms of computing capacity in the years immediately ahead.

The Director of the Bureau of Computing Services said that it would be necessary to improve the ability of the Fund's computers to communicate with other computers in a secure fashion, through both improved hardware and improved software. The present system was incapable of providing reasonable security in that regard.

Mr. Kafka remarked that he accepted that there was a need to improve the Fund's data processing facilities. Although the benefits might be difficult to quantify, it should be relatively easy to identify the costs. However, on page 14 of EBAP/84/76, the staff stated:

> Indirect costs are not included, such as hardware upgrades to provide adequate response levels, general purpose software packages, maintenance of staff skills, and other support costs. There are payoffs, however, associated with these indirect costs in the form of increased EDP staff productivity and reduced times and costs for systems development.

Why had the indirect costs not been quantified? Furthermore, on page 24, it was calculated that the manpower savings in a year as a result of the purchase of 72 new microcomputers would be three economist-years and two secretary-years, with a saving calculated at $400,000, representing an average salary of $80,000, a surprisingly high figure.

The Director of the Bureau of Computing Services replied that although the indirect costs had been calculated on a project-by-project basis, the information had not been provided in EBAP/84/76, because it would have been inordinately long if the details of the 40-50 projects involved had been given. Instead, the staff had provided aggregate estimates of the return on groups of projects in terms of payback periods.

A staff representative from the Bureau of Computing Services added that the salary costs referred to by Mr. Kafka had included overhead costs, such as benefits, which amounted to about 110 percent of salary. The figures were those used normally in the Fund for budget and planning purposes.

Mr. Clark remarked that he was rather more enthusiastic about the proposals for the Fund's computer facilities than the two previous Directors who had spoken. It was clear that the Fund had a great deal of catching

up to do. There were some short-term questions about making the best possible use of existing facilities, but there were also things that should be done now to make sure that the new facilities would provide the maximum benefit. For example, what was being done to involve users in the design of the new systems? What arrangements were being made to ensure that the kind of information used jointly by the World Bank and the Fund would remain consistent and accessible to the two institutions?

The Director of the Bureau of Computing Services said that each project was based firmly on the requirements of the users. They participated in the budget design from the beginning, and the final proposal had to be acceptable to them. The amount of unpublished data that had to be shared with the World Bank was less than had originally been thought. Special provisions were being made to ensure that the Bank would continue to have access to such data.

Mr. Shaw commented that there was clearly a need to update the Fund's electronic data processing capabilities along the lines proposed by the staff. On page 15 of EBAP/84/76, the staff referred to the major areas of new development, including computer applications, production systems, and computer technology. To what extent would the production systems have to be modified to meet new requirements in the years ahead? Given the necessity to move to a compatible system of computer technology, and the inevitably high costs because of delays incurred as a result of operating the joint computing facilities with the World Bank, to what extent were there changeover costs associated with moving to compatible systems? Had such changeover costs been included in the staff's cost estimates?

The Director of the Bureau of Computing Services replied that the cost of running the old and the new systems together had been calculated at the project level and included in the staff's estimates. The changes were being planned carefully, to be made in stages, rather than all at one time.

Mr. Shaw inquired whether it was intended to rent or to buy the hardware involved in the move to a compatible system.

The Director of the Bureau of Computing Services replied that a decision to rent or to buy would be based on the prices and the terms offered by the vendors, bearing in mind that the Fund's accounting system was different from that used by commercial institutions.

The Deputy Director of the Administration Department added that the question of whether renting would be cheaper than buying, over the anticipated useful life of the product, would probably vary from one product to another.

Mr. Clark asked what arrangements were being made to consult with the offices of Executive Directors on their computing requirements. He could not recall any recent consultation with his office.

Mr. Angeloni remarked that he agreed broadly with the proposals to upgrade the Fund's electronic data processing facilities. Such improvements would be necessary to ensure the efficient use of human resources in the Fund and to maintain the quality of the research being conducted by the Fund compared to that being undertaken in other institutions. The Fund could not afford to be out-of-date in those two areas. Many new staff members, particularly economists, were already skilled in the use of the new technologies, so that part of the problem of training was already solved. It was important that such staff members should not feel constrained in their research activity when they entered the Fund as a result of the limitations imposed by software availability. He agreed with Mr. Clark's comment that it would be helpful to take account of the needs of the offices of Executive Directors. The staff and the offices of Executive Directors should be placed on an equal footing in terms of access to computing facilities.

The Secretary noted that a number of requests had been made by the offices of Executive Directors in recent months for assistance in access to computing facilities. As a result of those requests, and bearing in mind that the needs of the Executive Directors varied considerably, that the technology was changing rapidly, and that at present it was impossible to provide on-line access for the staff, proposed guidelines for access to computing facilities by Executive Directors' offices had been issued in the form of a memorandum from the Managing Director (EBD/83/307, 12/12/83). In those guidelines, it had been suggested that existing procedures should be followed: if the office of an Executive Director required access to computing facilities, the request should be made directly to the Director of the Bureau of Computing Services, who would arrange for the staff of his Bureau to carry out the necessary work. At the moment, there simply were not enough personal computers available for Executive Directors' offices to have them on a permanent basis. A limited number of personal computers were available for lending as the need arose.

Mr. Angeloni commented that he understood the difficulties in the present circumstances; he hoped that the situation would not last long. In the long run, it would be preferable for those members of Executive Directors' offices who were capable of using computers to undertake the work themselves, rather than having it handled by the Bureau of Computing Services.

Mr. Clark agreed that, while there were a number of immediate problems that had to be resolved, the needs of Executive Directors' offices should be taken into account at an early stage with regard to longer-run improvements.

Mr. Morrell suggested that, given the expenses involved, it was important not to update simply for the sake of updating. With regard to the proposed new Fund EDP center, it was not clear what expenditures would be involved with regard to hardware, software, construction, and the like. Were lease-versus-buy options being considered? In the Administrative

Budget for FY 1985, to be discussed by the Executive Board at EBM/84/65 and EBM/84/66 (4/25/84), there was a proposal to spend $700,000 on upgrading the Burroughs computer. What was the point of that expenditure if the longer-term plan was to move to IBM-compatible equipment? With regard to lease-versus-buy options, although the tax-free status of the Fund would change the economics of the issue, it was not clear why the expenditures should be treated differently from an accounting point of view in the Fund than in commercial organizations.

The Director of the Bureau of Computing Services said that at present there were a large number of Burroughs systems in operation in the Fund. One of their most significant operations was to apply the computer language RAL in performing much of the statistical work done by economists. It was not likely that the RAL application would be removed from the Borroughs system in the foreseeable future because of the investment made in it, the fact that many economists knew how to use it, and the continued need to use it.

The Deputy Director of the Administration Department, commenting on lease-versus-buy options, noted that the Fund's accounting system had always operated on a cash basis. The attractiveness of leasing over buying would be different if the Fund adopted a capital budgeting system, which would involve amortizing costs of large investments over a long period, approximately the useful life of the investment. A paper was being prepared by the staff on the implications of moving to such a system; if a decision to do so met with the Executive Board's approval in the next few months, it would be possible to introduce the new system for the FY 1986 budget.

Mr. Morrell stated that he would support such a change. The Fund's present system of expenditure accounting was inappropriate, and it distorted the annual determination of income.

Mr. Camara remarked that it was clear that the Fund's EDP equipment was becoming increasingly out of date, that it needed to be upgraded, and that the cost would be high. However, there were also clear benefits, such as improvements in running the Fund's operations as well as in enhancing the skills of the Fund's economists. He invited the staff to provide further information on what provisions were being made for countries that were not yet in a position to furnish information to the Fund on computer tapes.

The Director of the Bureau of Computing Services replied that the introduction of new computer equipment would not alter the flow of data from the countries that lacked sophisticated EDP equipment. The data would continue to be received in manual form and would be put into the system by the Fund staff.

Mr. Clark asked what schedule was envisaged for implementing the proposed changes.

The Director of the Bureau of Computing Services commented that the introduction of a new computer system would take place in stages, according to which applications were considered most obsolete and in need of early replacement. The introduction of some new systems had already begun. The system being introduced into the Treasurer's Department would probably take about five years to complete. The economic information system would probably take about three years, although it would be operational about the end of the present financial year. The selection of a computer for the proposed new computer center could be made at the end of 1984 or early in 1985 if the Executive Board approved a decision in that regard in the next few weeks.

The Deputy Director of the Administration Department said that a paper on the new computer center would be circulated in about four weeks. It would discuss the pros and cons of a new facility, whether to lease or to buy, and the potential costs. A consultant had been engaged to look into the options with regard to the physical location of the center. Among the issues to be considered were how to communicate with the new center if it were not located in the present building and how the center should be staffed.

Mr. Erb stated that he was strongly convinced that it would be necessary to improve the information handling and distribution system within the Fund, including not only statistical information, but also nonstatistical information, in order to give Executive Directors better access to records of past Board meetings and the like, through an improved system of electronic communications. It was also clear that the improvements would cost a good deal of money, in terms of both personnel costs and the time needed to learn the use of the new facilities. However, the commitment had to be made.

Table 1 on page 16 of EBAP/84/76 was difficult to reconcile with the information on pages 46 and 47 of EBAP/84/64 (3/30/84), Mr. Erb continued. Perhaps the staff could provide clarification before the Executive Board's discussion of the FY 1985 Administrative Budget. It would be helpful if information could also be provided on the cost of the new data center and how those costs might be spread over the annual budget cycles. Furthermore, with regard to the pilot applications referred to on page 22 of EBAP/84/76, if the successful outcome of those applications led to the conclusion that other Fund departments should be automated, how were the possible costs to be accounted for between FY 1985 and FY 1987? On page 25 of EBAP/84/76, there was a reference to $2.1 million for planning activities, staff training, and resource management by the Bureau of Computing Services. Did that figure include the cost of training of Fund staff in general to use the new systems, or was the cost of that activity covered in the Administrative Budget for the area departments?

The proposed improvements in the Fund's EDP facilities needed further careful consideration, Mr. Erb suggested, and such considerations should include how to assist the work of Executive Directors through improved office automation. It might be useful to undertake a survey of a number

of Directors' offices to find out what their needs were in that regard. At present, the access of Executive Directors to information within the Fund was disappointing. Indeed, some Fund information was more easily available through commercial distributors of information packages. As the system was upgraded, it would be important to involve the various departments of the Fund in ensuring that the underlying data bases were coherent and oriented toward the kinds of decisions made within the Fund. Recent experience, such as the Executive Board's discussions of the Eighth General Review of Quotas, had highlighted the need for quick production of alternative sets of data. An upgraded computer system would help to undertake analysis of alternative scenarios in the context of Fund programs. It would also help in assessing changes in the data series used in different countries, thereby assisting the Executive Board to judge a country's performance in relation to the information that had been available at the time of earlier discussions.

The Deputy Director of the Administration Department observed that none of the costs of the proposed new data center was included in either EBAP/84/76 or in EBAP/84/64. That information would be provided in the forthcoming paper on the data center. The potential cost of the data center in FY 1985 would be difficult to estimate because of the various options involved including, for example, the location of an appropriate site. However, it would be possible to provide a rough estimate of the costs over a three-year period in time for the Executive Board's discussion of the FY 1985 Administrative Budget.

Mr. Feito remarked that the staff had put forward convincing arguments. Given the relative neglect of electronic data processing activities within the Fund over the years, it was not surprising that the cost of improvements would be relatively high in the period ahead. Nevertheless, the transition should be effected as rapidly as possible. However, it was not clear why no representative of Executive Directors had been included on the Executive Committee for Computing Services. Perhaps the lack of such representation accounted for the failure to assess the potential contribution of EDP systems to the offices of Executive Directors, as Mr. Clark and other Directors had pointed out. While the existing constraints in that area were understandable, the longer-term needs of Executive Directors' offices should be taken into account in planning EDP development in the period ahead.

The Deputy Managing Director noted that the Executive Committee for Computing Services involved itself in detailed issues of the management of resources and personnel in the Fund. Inclusion of a representative of the offices of Executive Directors on that Committee would blur the appropriate line between the responsibilities of the Executive Board and those of the Fund's management and staff. However, the Bureau of Computing Services was certainly aware of the needs of Executive Directors' offices, and it would take those needs into account in designing the longer-term upgrading of the EDP facilities. In many ways, of course, the needs of Executive Directors' offices would be similar to those of the various departments of the Fund.

Mr. Agah said that he, too, was convinced by the arguments that the staff had put forward for improving the Fund's information systems. However, was it possible to assess what the costs might be if nothing were done to upgrade the present facilities?

The Director of the Bureau of Computing Services commented that if the status quo were maintained, the financial operations of the Fund would be at long-term risk. Although, in principle, it might be possible to undertake the work of recording the Fund's financial transactions with members by hand, in practice the results would probably be unmanageable. The second major risk involved the physical environment in which the computer facilities operated. An incident such as water damage or the failure of the wiring could put the whole system at risk. The situation was a major argument for moving over to a system that was compatible with other computer systems. In that way, if a major failure occurred, it would be possible to undertake the most necessary operations through arrangements with other organizations.

Mr. Agah suggested that it might be useful to include in the annual budget estimates an assessment of the potential cost of computer failure.

The Deputy Director of the Administration Department remarked that while it would be difficult to estimate the actual dollar cost involved in a computer failure, the inconvenience to users would be high. The need to upgrade the present system to take account of the increasing volume of transactions lay behind the proposed expenditures on computer improvements included in the FY 1985 Administrative Budget. The staff was conscious of the needs of Executive Directors' offices; however, it had not felt able to put forward longer-term solutions to deal with Executive Directors' needs when there were so many urgent short-term problems with the EDP facilities, like insufficient computing capacity and highly deficient on-line capabilities. Also, office automation pilot projects had to be evaluated before appropriate equipment could be offered to Executive Directors.

Mr. Shaw asked what proportion of the budget of the Bureau of Computing Services was currently used for external time-sharing services and database management. As the Fund's technology base was upgraded, would some of those external services be transferred to the Bureau of Computing Services?

The Director of the Bureau of Computing Services replied that some of the costs of the services used by the Fund's departments were paid to the joint computer facility operated by the World Bank on a cost-recovery basis. Those costs would continue to be incurred until the Fund's own computing facilities were able to take over the applications in question. Other external costs that could eventually be avoided amounted to about $450,000 for the rent of computer time.

Mr. Erb commented that priority areas for upgrading of the computer systems included the Treasurer's Department, the Administration Department, and the Bureau of Statistics. With regard to other departments, including the offices of Executive Directors, it would be useful to develop a plan that laid out the step-by-step process through which the systems would be upgraded. He hoped that in that way a schedule could be developed that would avoid unnecessary costs.

The Deputy Managing Director stated that the staff, expecially the Bureau of Computing Services, was conscious of the need to involve users closely in the development of the improvements in the EDP facilities.

The Chairman, concluding the discussion, remarked that Executive Directors had expressed considerable interest in the proposed upgrading of the Fund's EDP facilities. It was important that the proposed program should not be overambitious and that it should concentrate on those areas in which cost savings would most clearly be seen. Some of the benefits, such as improvements in the quality of the information, in the quantity of information, and in the quality of the decision-making process, were not easy to express in monetary terms. The costs, however, could be substantial, and they should be set out as clearly as possible for Executive Directors. It was also important that the upgrading of the systems should be firmly based on users' needs. For example, the area departments should be closely associated in the purchase and application of microcomputers that could help to improve their access to the overall system and their ability to carry out sensitivity analyses, development of alternative scenarios, and the like. Improvements in the system should not be based on purely technical considerations. In that regard, it would be important to provide the necessary training for users. Only in that way would the system be able to provide the full potential benefits. It would also be necessary to take into account the needs of Executive Directors' offices and to improve their access to EDP facilities. The Executive Board should be kept fully informed of the development of the system, including expenditures on hardware, software, and training, so that, given the finite nature of the Fund's resources, it would be able to establish priorities for future improvements.

The Executive Directors took note of the Chairman's remarks, and concluded their seminar discussion of the staff paper on electronic data processing in the Fund.

LEO VAN HOUTVEN
Secretary