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Need for a World Management Information Network to assist initiation and coordination of global development programmes

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Summary: This note has been prepared in order to stress the need for further attention to one aspect of the plans currently under discussion within the United Nations and the Specialized Agencies, particularly through the Enlarged Committee for Programme and Coordination, to improve global development strategy and coordination. These have taken the form of investigations of ways to improve the operation of individual agencies and their coordination.

This note suggests that agencies face an information and coordination problem which is an integral part of that of other international and national organizations and that the only effective long term solution is one based on an assessment of the **management information requirements** of all organizations in the face of global problems. An economical solution using a central computer is discussed.

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0. Summary of argument

1. The UN problems of global programme coordination and strategy are an integral part of similar problems in other types of organization with the same programme objectives as the UN.
2. The UN recognizes its dependence on these organizations.
3. Current plans to solve the UN problems aim at a UN inter-agency solution only, with an emphasis on the exchange of coded or microfilmed documentary material as the key to coordination.
4. The resultant high-volume flow of information will not facilitate the task of the programme decision-maker since the system will not be designed to pin-point communication gaps or areas of need. The system will not assist the non-UN organizations on which the UN depends.
5. The emphasis on the increased flow of documents is due to the lack of distinction between management information and programme administration documents. Critical management information is diluted by the mass of documentary material.
6. The discussions on the use of computers emphasize either administrative uses, document exchange or indexing, or statistical research. None of these systems take full advantage of the computer as a management tool.
7. Information on the existence, location and programme activities of organizations within the world system is either non-existent or poorly distributed (because of the cost) and therefore only available after a complex series of search operations.

8. Information on currently active bodies and programmes is critical to adequate global programme coordination and planning, analysis of needs, fund allocation, programme evaluation, programme implementation, and document distribution. The difficulty in obtaining such information hinders organized reaction by all types of organization and department to new and overlapping problem areas.

9. An information system is described which could act both as a contact list for normal administrative purposes and also as a powerful management tool, for the UN agencies and for non-UN bodies. The use of the system by non-UN organizations would in itself improve programme coordination. The system does not appear to require finance or computer hardware which is not already available or planned, nor does it appear to conflict with any detailed existing proposals. The proposed system does however represent a change of emphasis towards an integration of isolated parts of the present static information system in a dynamic computer environment. The design requirements of an integrated system should be used as guidelines if current policies will only permit the use of agency-focussed information systems for the present.

1. Introduction

This note has been prepared in order to stress the need for further attention to one aspect of the plans currently under discussion within the United Nations and the Specialized Agencies to improve global development strategy and coordination. These have taken the form of investigations of ways to improve the operation of individual agencies and their coordination. Detailed discussions have taken place through many bodies including the:

- Administrative Committee on Coordination:
 - ACC computer users' committee
 - ACC inter-agency working party on indexing and documentation
 - ACC inter-agency study group on evaluation of technical cooperation programmes
 - ACC consultative committee on administrative questions.
- Expanded Committee for Programme and Coordination Individual agency:
 - management committees
 - data processing committees.
- United Nations Development Programme
- United Nations Institute for Training and Research.

This note suggests that agencies face an information and coordination problem which is an integral part of that of other international and national organizations and that the only effective long-term solution is one based on an assessment of the management information requirements of all organizations in the face of global problems.

2. Current situation

The present problems and activities of the UN and Specialized Agency committees on coordination and the use of computers have been briefly summarized in a proposal by Walter M. Kotschnig (United States Member of the United Nations Ecosoc Enlarged Committee for Programme and Co-ordination) entitled 'Development of modern management techniques and use of computers' (E/AC .51/GR/L. 9, 7 October 1968) . The note cites the following problems:

'.. it has become more and more difficult for any individual, whether in government service or in an international secretariat, to be aware of the totality of the United Nations family programme and activities. This in turn complicates the process of coordination, makes over-lapping and duplication more likely.. .'

'.. the lack of an adequate and carefully organized system of presentation of a myriad of relevant data and determinants renders highly problematical, if not impossible, the establishment of overall programme priorities. . .'

To improve the situation, the note suggests that the UN system organizations should 'work in the directions of more intensified use of modern management techniques' and should 'review the existing and presently foreseen uses of computers and other recent advances in data retrieval and presentation by United Nations organizations' in order to prepare for larger programmes of action on a 'more coordinated basis under the global strategy for development. ' The note points out that solutions to the serious coordination and information problems are being sought by a variety of UN agency bodies.

3. Scope of management problem

In terms of the management problems involved, it is important to recognize that

- the attempts to coordinate the UN system programmes represent the most general attempt at global development coordination in existence or envisaged;
- these coordination attempts are not the only areas of programme coordination within the world system. Much coordination has been achieved and is planned at the local, national and international level which is only indirectly linked to UN activity;
- these other networks of coordination and information processing are however designed to cope with problem areas with which the UN is vitally concerned. In many cases, the UN is forced to work through these networks, whether they are international associations of specialists, world youth movements or the distribution system of a group of multinational business enterprises;
- unless the analysis of the global situation which the UN (and non-UN) programmes must face, is based on a management analysis of coordination and information networks in general, rather than a management analysis of the UN system, agency structure, or

special problem areas, then the proposed solutions run the risk of recommending organizational structures, programmes and information networks which will duplicate one another as well as more efficient and better funded structures outside the UN system.

A management approach to the UN system must, therefore, recognize a three level problem of data processing, coordination and management guidance of:

- each individual UN agency, which is one part of the
- UN system, which itself is only one part of the
- world system of governmental, non-governmental and profit organizations, the improvement of which is a fundamental objective of the UN, to the extent that it attacks or alleviates world problems.

It is important to avoid the assumption that improvement at either of the first two problem levels will necessarily be an effective answer (on a cost/ benefit basis) to the problems arising outside the UN system or interacting with it. Weaknesses in coordination and information systems, critical **to the** functioning of the UN and its programmes outside the UN system may not be detected unless the overall coordination problem is clearly determined in advance.

4. Interaction between UN and non-UN networks

Agencies within the UN system constantly face the problem of effective interaction with other organizations, programmes and information processing systems, whether national or international. The UN system needs to mesh effectively with these other systems in implementing its programmes and in ensuring the generation of new programmes. The need for public awareness, acceptance, support and involvement has been stressed in many UN reports as vital to effective programme implementation. For example, the UN General Assembly resolved that the Office of Public Information 'should primarily assist and rely upon the co-operation of the established governmental and non-governmental agencies of information to provide the public with information about the United Nations' (Resolution 13 (I) 1946) . In 1968, the Secretary General stated '... it is more important than ever to do everything within our power to help create that receptivity to United Nations objectives and policies which is as yet so seriously lacking.' (Press release ECOSOC/252 SG/M/65) . Many UN recommendations call for action by non-UN inter-governmental and non-governmental organizations.

From currently available reports on the coordination and information processing problem, it appears that most effort is being concentrated on the first level problems (e.g. 'the main effort of the United Nations and its agencies has been naturally to ensure the dissemination of project information to their own inter-governmental body, committees, experts and substantive services...'), (E/4486/Add. 1, 19 April 1968) . Some effort has been made on the second level problem (e.g. the existence of the Enlarged Committee on Programme and Coordination and the creation of such bodies as the Inter-Agency Working Party on Indexing and Documentation; also '... some arrangements have been made to make... (project information)... available to other members of the United Nations family as well as to member countries.' (E/4486/Add.1, 19 April 1968)).

The third level problem does not *seem to* have been adequately defined as vital to any management or data processing proposals made for the UN system. Some global projects effort have been undertaken, but only for specialized and therefore non-interacting problem areas (e.g. Unesco-ICSU contacts on the world scientific information network for document location; tentative proposals for moves towards planetary environmental management at the September 1968 Unesco expert conference on the biosphere; classification of national science policy throughout the world.) No **general** systematic study of the interaction and control of problem areas in terms of all the existing and planned organizational structures and management information requirements appears to have been made. The approach to each special problem area has been elaborated without any systematic consideration of interaction with other problem areas and the type of information required to guide such interaction. Without a framework in which problem area interaction is automatically considered, no coordinated global approach to development strategy is possible.

In order to achieve its objectives, the UN needs to consider:

- solutions to its own administrative, data processing and programme problems in the context of the equivalent management problems of the world system as a whole;
- means by which flexible guidelines and facilities can be established for other bodies within the world system to aid them in the solution of their management problems. This would ensure that their activities and contacts can easily link together to enhance the overall approach to the solution of world problems.

Increased coordination and effectiveness of the activities of organizations unconnected with the UN system is a guarantee that the problems with which these bodies are independently concerned, will be dealt with effectively and not become a critical problem which the UN is forced to handle with its own limited funds and administrative resources. The solution to UN internal administrative problems is, therefore, closely linked to non-UN organization effectiveness and UN external programme objectives.

For a proposed solution to be effective, the management problem should be analysed in terms of achieved and planned coordination, effectiveness of organizations and programmes, of whatever type, and the role, the UN organizations can play in interacting with other organizations to strengthen the weaker areas of the world system. An ad hoc approach does not permit any sophisticated planning or control of the situation.

5. Problems currently treated on an ad hoc basis

There is a range of problems within the world system bearing directly on the facilitation of global development strategy which are treated on a piecemeal, patchwork basis. These include:

5a. Lack of information on organizations: Information on bodies generating and implementing programmes and using project reports. Few countries or international agencies have attempted to build up a comprehensive systematic list of bodies which affect or are affected by their programmes. For example, in the UN system 'Most of the organizations have not up to the present handled the project information in a systematic way in a central location...' (E/4486/Add.1, 19 April 1968), although it is recognized that '...much staff time and money could be saved by a pooling of data and an automatic exchange of new material. The material could be of particular usefulness at the stage when identification of needs was under study' (E/4486/Add. 1, 19 April 1968).

Such a central data pool *is* important because the juxtaposition of programme and contact information is vital to the avoidance of any duplication of research and publications and to any overall analysis of programme priorities (problems raised by Mr Kotschnig). Such contacts are also vital to any awareness of, and utilization by, organizations outside the UN system of the work already done. These are general problems faced by the UN and Agency Offices of Public Information.

The United Nations Ecosoc Administrative Committee on Coordination is 'interested in encouraging measures which could further facilitate the inter-agency dissemination of project information' (E/4486/Add. 1, 19 April 1968) as a solution to one aspect of this problem. One project envisaged is the creation of country information files to be placed on microfilm for use throughout the UN system. This would however be designed as an **inter-agency** solution only, irrespective of the supplementary information needs or logical interface requirements of organizations interacting with the UN system, on which the UN is dependent for the implementation and effectiveness of its programmes. This work would, therefore, have to be duplicated in a variety of forms outside the UN system thus reducing the utility of both and increasing the cost of the resultant inefficient information system.

The ACC states that 'The use of reports in project and programme formulation is mainly a matter for Governments.' (E/4486/Add.1) which apparently restricts and simplifies the management problem, although in terms of achieving UN global development objectives and evaluating programme effectiveness, study of the use made of existing programmes is a critical process in formulation of new programmes. This is vital to a management overview of development strategy. Current information on bodies using and supplying information to UN bodies, whether they are within the UN system, the government system, the nongovernmental, non-profit system, or the commercial system, appears to be split between and within each agency and maintained under at least five entirely separate functional groups:

- publication sales lists
- general information and public relations lists
- expert advisor lists
- consultative status international organizations
- programme implementation organization lists and directories by area or programme.

This is done for **administrative** convenience, even though the same body may be listed in more than one file and in more than one agency. Because of the ad hoc approach, there is likely to be duplication of effort in maintaining files within and between agencies, as well as important omissions in the pattern of contacts where bodies have not been detected by one or more agencies or departments. Any such file organization makes an overall view impossible on a basis useful for **management** and global strategy purposes, since even details on the programme significance of individual organizations in the world system, for the UN, are scattered through a number of departments which may not liaise.

Most UN system organizations are studying the maintenance of a central 'memory' on project information (E/4486/Add. 1, 19 April 1968) . *It* has apparently not yet been decided whether such memories would be computer based or what sort of material they should contain and have exchanged between agencies (e.g. programme contacts, programme objectives, report titles, or detailed project reports) . The current emphasis does however appear to favour an exchange of a large volume of reports or microfilmed **documents** rather than small quantities of **management information** . The latter could be fed into a central computer to maintain an up to date clear and comprehensive picture of the existing operational and research programmes and contacts which could be used to improve future programmes. As Mr Kotschnig points out, reports analysing problem and programme relationships contribute little to the solution of these problems. **A more dynamic and highly ordered information system is required** for this purpose.

This situation is reflected outside the UN system, both in and between other inter-governmental agencies, within the national government networks, and as regards the information requirements of specialized nongovernmental, non-profit organizations (e.g. science, medicine, youth, education, etc.). Although carefully collected figures are available each year on the estimated population of each town, country and for the world, no such systematic information is available on the number, nature and contact addresses of the organizations to which individuals and other organizations belong. The data collection focus in general has been on the problem areas rather than on the organizational network and its resources through which solutions can be focussed on a variety of problems.

There is therefore no body which is in a position to study, assess and recommend the allocation of organizational resources or attempt any form of global strategy formulation in the face of interacting problem areas. Where such recommendations are made, they are not conceived in terms of the overall organizational network through which they must be implemented. The only bodies in existence or envisaged with this sort of capacity are the multinational business enterprises working through the world trade centres. These have sophisticated computer facilities to assist in the rapid allocation of organizational resources in the face of problems and opportunities but are not directly interested in global development although their networks and coordination constitute important resources in development planning. The low degree of information

availability and organization therefore:

- reduces ability to initiate and maintain contacts; leads to duplication, wasted effort and funds;
- leads to dilution of effort and non-optimum solutions because of lack of interaction between bodies interested in related fields;
- conceals important communication and coordination gaps which may be vital to effective programme implementation

5b. Lack of integrated information on organizations and programmes: Available information on organizations and programmes is structured in such a way that it is difficult to determine through what programmes, organizations and information networks organizations coordinate their activities and through which effort should be channelled

Most information on organizations and programmes is provided (whether within or outside the UN system) in the form of specialized lists without any structure or means of cross-referencing by programme or membership of some coordinating body. From a management point of view, it is therefore extremely difficult to pick out critical points in the world system where coordination is required and can be organized with minimum effort on an optimum cost/effectiveness basis. Similarly, it is difficult to determine where coordinating points already exist and may be used with minimum allocation of resources to ensure effective programme implementation and information processing.

As an illustration of the sort of management problem that should be automatically signalled once it arises, a United States National Commission for Unesco report concluded in 1964 that 'Communication is generally sporadic and uncertain between the international NGO and its national affiliates and individual members. . . Individual American members, for example, appear to know very little about what their international NGO is doing. In some cases, this includes even the executive secretary of the American affiliate. Much the same situation is believed to apply in other countries.' A report on the 1968 Freedom from Hunger Conference for National Committees in Asia and the Far East indicated a 'seeming lack of understanding' how the governmental and non-governmental organizations represented could help one another. Non-governmental organizations were reported as often not knowing what other national organizations in the same country were doing. An 1968 FAO brochure states that 'In some cases even the member governments of the Organization are not fully aware of the variety and scope of information readily obtainable through the FAO.'

It is probable that communication between many inter-governmental agencies and organizations, national government departments and national organizations is equally ineffective in many sectors. The degree and extent of ineffectiveness and its consequences are almost impossible to determine with present procedures.

The current procedure with regard to problem management appears to be to wait until a situation becomes critical and sufficient pressure is exerted through an ad hoc network of bodies (which may or may not be adequately funded despite the responsibility tacitly placed upon them) . When funds are finally obtained for the needed programme, information is then gradually built up on the organizations through which the programme should be implemented. This information may then be published in directory form, but not necessarily with any provision for regular updating or cross-reference to other directories in preparation for the next problem.

This is management by crisis with a long reaction time. It can only produce temporary solutions to specific problems. The procedure does not facilitate coordination of existing programmes either within a given subject or geographical area or where several problem areas interact across discipline and geographical boundaries. This is particularly important in environmental problems.

Lack of information on coordination increases the problem of fund allocation by organizations within and outside the UN system because it is difficult to pinpoint quickly and with certainty which bodies constitute the channels for effective fund allocation with respect to a particular problem area .

It is also difficult for the governmental and private bodies with funds to allocate, to know which problems are becoming critical in the face of the requests by all organizations. In a comprehensive information system, this would be indicated by the increase in the number of meetings and organizations in a sensitive problem and/or geographical area. This should be automatically signalled as an indication of the growing points in the world system to which additional aid needs to be channelled.

The lack of any information on the structural relationship between organizations also hinders the process of evaluation. Detection of the points to which project information is channelled through non-UN organizations, must be done on a lengthy ad hoc basis, programme by programme, to check on the utility of each, if such an evaluation is undertaken.

Linked to the problem of evaluation is the difficulty under present circumstances of rapidly detecting and initiating corrective programmes to combat new primary problems (e.g. natural disasters, etc.) and new secondary problems (e.g. ineffectiveness, inefficiency or breakdown in particular parts of the world system) . Global development cannot be effectively undertaken on a continuing basis but is dependent on intermittent action by ad hoc pressure groups whether within or outside government circles

Many problems within the world system are dealt with on a continuing basis through non-UN and non-governmental organizations, information systems, agreements, programmes and meetings. Any information system must be structured to assist and integrate the activities of such non-UN organizations and programmes. A UN or agency focussed information system does not improve the cost/effectiveness of the global information system by **making full use of other Information systems wherever possible** and facilitating the use of any such system by other bodies.

The consequent duplication does not contribute to the solution of issues identified by the Enlarged Committee for Programmes and Coordination and annotated by the Secretary-General (E/AC . 51/GR/15, 7 October 1968), namely: an optimum concentration of resources; a reduction in the burden on the administrative resources of Member States and of members of the United Nations family of organizations; a flexible, prompt and effective response to specific needs; the evolution of an integrated system of longterm planning on a programme basis; and the institution of systematic procedures for evaluating the effectiveness of operational and research activities.

The UN organizations need to be aware of what is being done and not done, by whom, and how effectively, in order to check that problems are dealt with **either** through UN or non-UN programmes before they become critical. This awareness needs to *be* on week by week basis and not subject to the lengthy delays required to locate retrieve, check and order information generated in all parts of the world. Current and envisaged plans do not, however, appear to be converging or cross-linking sufficiently to lead to systematic global problem management using management and data process techniques, which would be considered essential in, for example, any global commercial enterprise or military organization.

6. Implications of the Distinction between Management Techniques and Administrative Techniques

There is some confusion and overlap associated with the distinction between 'management' and 'administrative' techniques. Management techniques are sometimes considered to be only applicable to **business** management as developed through the schools of business administration. Schools of public administration and governments emphasize the use of administrative techniques in discussing government departments. Management techniques have, however, been developed to the point where they can be applied irrespective of the type of organization (business, government, private, military) or its objectives (profit, non-profit, etc.).

Management techniques are **problem** oriented. They are required: to evaluate on a continuous basis the internal and external problems an organization must face; to organize, coordinate and balance the resources of the sub-divisions of the organization, to deal with the problems and to guide their implementation of programmes; to initiate or recommend new programmes and long-term plans in the face of new problems; and to ensure that the process of management is constantly improved.

Administrative techniques are **programme** oriented. They are more concerned with the techniques of implementing voted programmes as opposed to the management problems of determining which programmes should be implemented on the basis of the resources available and the long-term objectives of the organization. Both techniques are required in any international organization with an ability to initiate or recommend programmes .

The lack of compensation for the current political science bias towards governmental organizations (despite the practical necessity to gain acceptance from and work through other types of organization), together with the interests and low degree of interaction of the environments in which management and administrative techniques have been respectively developed, have had three important consequences for global development:

- analysis of the resources available for global development has focussed on the administrative problem of inter-governmental and national governmental organizations;
- management techniques applicable to the global development problem are not understood and have gained little acceptance outside the business circles in which they were mainly developed. There appears to be no channel through which this transfer of techniques could take place.
- no body analogous to the schools of business administration or public administration exists to foster the development and application of management techniques to all aspects of global development from an interdisciplinary and global perspective. (For example, UNITAR is primarily concerned with the UN perspective.)

7. Implications of the distinction between documentation and management information

A vital preliminary to any future management guidance (even if it is of the loosest kind) or recommendations on the control of problem areas within the world system, is an adequate management information system.

The necessity for a global information system is recognized to some extent, but solutions to the information problem as currently defined are expected to be very costly and have, therefore, been by-passed in favour of ad hoc measures. The reason for the high cost estimates is that the **documentation** problem of keeping track of the mass of detailed factual information is confused with the **management and communication** problem of keeping track of information on bodies controlling, evaluating, formulating and implementing programmes, and coordinating memberships, relationships and information networks which link them in terms of their problem areas.

A management approach concentrates on keeping track of the **producers of information** and their coordination of their **current and planned** activities. A documentation approach concentrates on the **information produced** when it eventually appears in published form. The first is focussed on the initiating points for present and future activity, whilst the second is focussed on the published record, if any, of past activity. The fact that *one* organization can coordinate the production of many documents in the context of one programme, is an indication of the difference in the volume of information in each case, the scale of the problem in each case, and the cost of each solution. Intermediate between these two extremes is information on sources of information (e.g. bibliographies of bibliographies, directories of periodicals, directories of directories) which can *be* incorporated in a management information system, since it represents the key to information collection points and systems in a particular problem area.

No systematic attempt appears to have been made to analyse or solve the global management information problem, which is very much simpler than the documentation problem, because the volume of data is very much lower by many orders of magnitude and is not increasing at the same rate. (In fact, by elaborating the network of information channels linking bodies throughout the world system, a partial solution to the documentation problem is achieved. This is because each such body is equipped and motivated to detect and

process documents generated within its own special field of interest and this process would be accelerated if the detailed global information network was known and accessible to such organizations.)

The documentation problem and management information problem should be carefully distinguished. The first implies the retrievability within a 'reasonable' period of time, of all past relevant document. The second implies the immediate availability of information on all **currently** active bodies, programmes and information networks at all levels of the world system. This can be built into an integrated picture of the global situation and organizational resources.

Decision makers faced with global problems can no longer afford the time to wait for libraries and information centres to locate and retrieve relevant documents containing management information which are dispersed throughout the documentation system. They no longer have time to read and absorb detail from a wide variety of relevant sources. Information must be summarized, structured and presented to highlight priority problem areas, resources and alternative courses of action in order to facilitate discussion, planning and decision-making, particularly in committees.

8. Economical solution to the global management information problem

The first essential and economical step and key to any such presentation is **information on the network of bodies and programmes currently operating in a particular area**, since it is through these bodies that information is collected, processed and evaluated and through them that programmes are implemented and coordinated. It is very important not to treat details on organizations as **static** mailing or directory lists split between and within agencies and departments which are in contact with such bodies for different administrative reasons (e.g. sales, public relations, consultative relations, programme implementation, etc.).

The significance of outside contact for effective management can only become apparent by interrelating the functions performed by each body for the agency and for other bodies. By suitably structuring files on organizations and their relationships **as a network** within a central computer memory, the network itself can be displayed **as a whole** or at different levels of detail down to a report on a single link or node. This can be printed out or displayed on a direct-access device with a TV screen, in terms of the perspective of any organization in the network. Any such **dynamic** presentation has all the communication and conceptual advantages of audio-visual aids.

The computer could be programmed to diagnose weaknesses in the organizational network in a manner equivalent to that used for testing electrical circuits, space systems or engineering structures. This could also be done in relation to statistical data on the problem areas with which they are concerned. Any such weaknesses can be printed out or appropriately highlighted on a display screen for the benefit of the decision maker or committee members responsible for a given area. The probable effects of alternative courses of action on the network can also be shown with their resultant weaknesses. This would constitute a very powerful aid to decision-making and management at the committee stage and is the reason why such systems are used in military and commercial organizations.

Apart from its value as a management tool, such a system constitutes an organization of information which can be used with much greater flexibility for administrative purposes (e.g. sales publicity, distribution lists, programme contacts, etc.) and to improve the circulation of documentary material.

9. Advantages of a network file organization

Specific advantages can be summarized as:

- **aid to coordination of global development strategy.** The network display would give a direct impression of the structural links within the organizational network thus facilitating an understanding of organizational resources in a particular problem area and the probable consequences of particular programme decisions from a global, interdisciplinary perspective. This would be useful for policy-making bodies, whether within the UN, the Specialized Agencies, outside the UN system or at a national level. Such systems can be constructed so that if an organization only wishes to make available information on certain links within the network for which it is responsible, it may do so by authorising the computer to give only certain levels of detail to certain categories of organization making inquiries. The audio-visual aid advantages of a network display could be used to inform national governments and plenary assemblies in a rapid, clear and unambiguous manner of the current status of global problem areas and the disposition of organization and programme resources.
- **accelerate integration.** Local, national and international integration becomes a meaningful term which can be clearly measured and observed in terms of the links maintained and planned between bodies throughout the world system network. Bodies throughout the system can immediately determine with whom they could profitably be in contact with regard to any aspect of their programmes.
- **decrease emphasis on political necessities.** A network display of information links decreases the divisive emphasis on political or administrative recognition or non-recognition of some groups of organizations by other groups of organizations. Information links are neutral and do not necessarily imply a stronger link. This would bring organizations into much closer relationship with the United Nations by reducing the conceptual and communication gap between 'local', 'national', and 'international' across discipline and administrative boundaries. It would, for example, considerably facilitate the task of the UN and Specialized Agency Offices of Public Information.
- **programmes: identification of needs and appraisal of requests.** Reports on problem areas can be evaluated and compared much more effectively to determine the level of priority of each if it is clear to what extent the reporting organization is representative of the organizations in the particular problem area. The existence of the network considerably facilitates the task of surveying opinions of key organizations in a particular problem area. This would be of great assistance to international secretariats

in preparing reports.

- **programmes: fund allocation.** Once priorities can be established and problem areas and organizational resources highlighted unambiguously, it becomes much easier for fund allocating committees and foundations to pinpoint accurately where their funds are most required in line with their own particular interests. Such bodies can determine much more easily whether funds allocated through a particular channel in fact result in greater integration. This should make them more willing to allocate funds rapidly to needed programmes for which no precedent exist.
- **programmes: planning and initiation.** The existence of the network would facilitate the task of contacting and bringing together key organizations and specialists in a particular problem area at meetings to plan and gain support for a programme, prior to implementing it through their members and contacts. It gives a much clearer idea of the existing channels through which communication and coordination can take place and be scheduled, thus avoiding the cost and inefficiency of creating and administering new duplicate channels. This would clearly reduce the administrative burden on committees responsible for implementation of programmes on a wide variety of subjects.
- **programmes: implementation.** Once the programme has been planned all the bodies in the problem area, which need to be informed and receive documentation and which which liaison must be maintained, can be contacted immediately and on a regular basis, due to the manner in which the files are organized in the computer. This avoids the delays, inefficiency and communication gaps in programme implementation. The system ensures that relevant material is sent to all interested bodies and no others thus reducing distribution costs. The system could be extended to maintain information on pools of specialists within which technical advisors and field workers must be sought for certain types of programme.
- **programmes: inter-programme coordination at regional and field level.** It is not only essential to ensure inter-programme coordination at the policy level, contacts at the field level during implementation must also be guaranteed. The existence of the network would enable field workers from many different types of organizations to be notified automatically of programmes in their area with which they can integrate their activities, or of which they need to observe the consequences.
- **programmes and meetings: distribution of results.** The reports (or report details and cost) of meetings and programmes could be distributed accurately using the network to all bodies likely to be interested in the results on the basis of an 'interest profile'. This would make distribution lists more selective and flexible thus reducing costs whilst at the same time increasing effectiveness. This facility would considerably increase the degree to which bodies are informed of each others programmes thus increasing liaison and integration of programmes and reducing duplication, overlap and omissions. This would be of great assistance to the UN and Specialized Agency sales departments and distribution departments. Meeting coordinators could also use the network to locate and inform coordinators of related projects of the results of their latest meetings.
- **programmes: evaluation of results.** The network would facilitate the task of surveying those organizations which should have been affected by any particular programme in order to evaluate the effectiveness of the programme. Where a programme should have resulted in greater integration and coordination between organizations, the extent of any such development should be evident from computer analysis of the network.
- **research.** The existence of the network would open a new field of research on methods of increasing the effectiveness and integration of the world system in the face of problem areas. In particular, techniques could be developed to determine: the optimum degree of integration and coordination of different sections of the network, the location of network weaknesses critical to the functioning of the overall system, the location of key points which should be linked in the network, the location of areas where meetings, movements or new organizations should be encouraged, etc. The network would constitute an extremely important source of data for testing theories of international relations, particularly with the use of simulation techniques. Such a network would facilitate the rapid application of research conclusions, thus increasing the sophistication of the techniques used in global development activity. In particular, computer analysis of the network could be gradually extended to predict automatically and signal more complex problem areas and areas of weakness.
- **static information guides.** Any such network would not replace published organization directories. The network would in fact facilitate the production of specialized directories by country or subject area, as required by individual programmes or for bodies which do not need to maintain contact with the central computer through the planned international data networks of the 1970s. The organizational network could be analysed prior to planning meetings in order to supply delegates and participants with an up to date list of bodies and programmes active in or influenced by the fields under discussion. This would be particularly useful in complex organizations like the UN system where the risk of overlap with other bodies and programmes within and outside the UN system is increased. Such lists would constitute an important part of the distribution list for the results of the meeting.
- **relationship with other information networks.** A number of specialized information networks are planned or in operation with which the proposed network could be designed to interact. These include the: ICSU-Unesco world scientific data network; environmental/biosphere data network; Unesco science policy-making body data; national accounts data; social indicators data; world trade centre commercial networks; United Nations own inter-agency documentation network. These and similar programmes will become increasingly important with the creation of national and international computer data links during the 1970. The optimum design for such networks, particularly the manner in which they should interact, cannot be effectively determined unless the basic data on the organizations within the world system is available and can be studied in a dynamic

environment.

- **career incentive.** Attracting sufficient qualified persons into organizations contributing directly to the global development process is a problem for such bodies. A widely accessible network display overcomes the communication gap and enables individuals to pinpoint challenging problem areas where effective action can be taken, and channel career inquiries to the responsible organizations.
- **conceptual importance.** The elaboration of such a network linking all organizations within the world system in terms of their actual day to day pattern of contacts would decrease the current tendency to treat organizations as relatively isolated entities. This emphasizes friction between organizations rather than their operating links. The network could constitute a realistic physical model of what has hitherto been an abstract and relatively meaningless concept, namely 'world society'. The existence of such a model could have social and educational consequences of considerable value to the stability of the economic and social system.
- **cost of the system.** Although this system would be extremely useful and therefore appears costly, the amount of data involved is likely to be not greater than that maintained on policy holders on a day to day basis by a large insurance company. Unfortunately, one feature of the current information situation is that no accurate estimate of the number of bodies and programmes which could be gradually included in such a network is available. -

10. Implementation

The proposed global management information system could be implemented immediately by storing and structuring in a computer information on organizations listed in directories and agency files. The network structure of the files stored in computer memory could be designed to facilitate the process of gradual build up of the system both in terms of the number and types of organizations listed (inter-governmental, non-governmental, commercial, national, etc.) and the nature of the links between them (membership, distribution list, collaboration on programmes, etc.). Initially the system could be used by the United Nations and other bodies as an effective survey, distribution, public information and contact list. As techniques for the analysis and display of the network are perfected, it could be used as a powerful aid to global development planning and coordination.

Any such central bank of information, as envisaged by Mr Kotschnig, would be responsible for maintaining and updating files. Depending on economic factors, the relevant sections of these files could either be used to prepare directories through a computer typesetting routine or copied and sent to agencies, governments and other organizations around the world for use in their own computers. As the cost of linking computers nationally and internationally is reduced in the 1970s, transfer and updating of relevant sections of the central and agency computer files could be handled automatically.

11. Conclusion

In order to build towards a sophisticated system which can help to predict weaknesses and problem areas, it is important to ensure compatibility and coordination in the treatment of the type of management information that could be usefully stored in a central computer. The compatibility problem is not as serious as in the field of documentation where formats have already been frozen and the volume of information is high. Little has been done with regard to global management information on a computer basis. Formats and coordination are still in the planning stage. A central body could now act to prepare the guidelines and core for the sophisticated system which is now economically feasible. Unless action is taken, not only will it be impossible to keep track of documentation produced in the future, but a multitude of new organizations and programmes will be created. They will produce documentation and information systems because of confusion and lack of coordination, and will therefore compound the documentation problem and further decrease the effectiveness of inter-organization communications and global development planning.

The global strategy and coordination requirements for the larger United Nations development programmes of the future, mentioned by Mr Kotschnig, need to be considered carefully in the light of the following comment from the introduction to a 1968 management conference session of the College of Management Control Systems. 'Evidence is mounting that the environment which managers seek to control - or, at least, to guide or restrain is increasing in turbulence and complexity at a rate that far exceeds the capacity of management researchers to provide new and improved methodologies to affect management's intentions. Faced with the consequences of force-fed technological change, and the concomitant changes in the social, political, psychological, and theological spheres, there is real danger that the process by which new concepts of management control are invented and developed may itself be out of control relative to the demands that are likely to be imposed upon it.'

The proposed information system represents a step towards the solution of the management problem at the global level. It is a valuable opportunity for the United Nations in view of its current discussions on the solution to closely related issues. The cost would be relatively low since it is not a new system which is being set up, but merely the dynamic juxtaposition of the currently isolated parts of the existing system.

Such a system should constitute a practical channel by which local, national and international bodies could initiate and maintain contacts. This would considerably accelerate the persuasion of public opinion and the creation of political will, which the Secretary General of UNCTAD has stressed as being of the highest priority 'in order to avoid a second Development Decade of even deeper frustration than the first one' (TD/96).

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