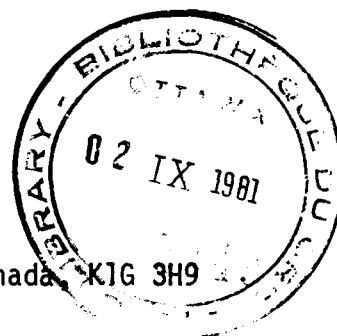


44531

GLOBAL, AFRICAN AND NIGERIAN EFFORTS TO DEVELOP
INFORMATION SYSTEMS FOR SOCIO-ECONOMIC DEVELOPMENT

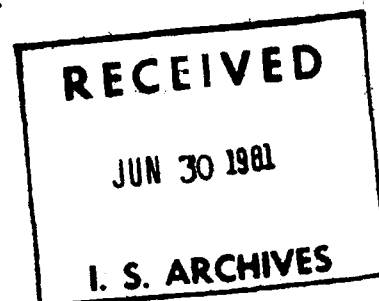
by

Wilson O. Aiyepoku*
Program Advisor
Information Sciences Division
International Development Research Centre, Ottawa, Canada, K1G 3H9



Summary

The conceptual and operational framework for a development sciences information system (DEVSI) is described in the context of the objectives of mission-oriented, global information systems. The relationship of the operational Pan-African Documentation and Information System (PADIS) to DEVSI is demonstrated and it is shown that the continuing efforts of the National Library of Nigeria to define a national information policy as a crucial component of rapid socio-economic development in Nigeria will achieve maximum effectiveness if pursued in the context of DEVSI and PADIS.



* On sabbatical during the 1980-81 session. From October 1, 1981:
Department of Library Studies, University of Ibadan, Ibadan.

GLOBAL, AFRICAN AND NIGERIAN EFFORTS TO DEVELOP
INFORMATION SYSTEMS FOR SOCIO-ECONOMIC DEVELOPMENT

I. INTRODUCTION

There is a general realization that many development studies and projects represent a process by which people who need information go out into the market and buy it. They commission a survey, hire a consultant, start a research programme; but, physically, what they get is a document which presents the information they have purchased. This is information for which they were willing to spend N10,000, N50,000, often more than N100,000. They bought it because they believed that it would be useful in their policy-making, planning or operations. Potentially, it could affect investments of millions of naira and change the lives of whole communities. But the documents, which represent the key link in this chain, are not easy to find once they have been presented. Investments of time and money in generating information are duplicated by different agencies (sometimes even by the same agency) simply because they do not know that the information they want has already been put together. To record the existence of all these documents, and hence of the information they contain, costs about N10 to N25 per item depending on the methods used. This is a very small increment on the original investment and, by placing the information in a system from which it can be retrieved when needed, one has the facility to avoid the loss of money and of time that would be involved in conducting a new survey, hiring a new consultant or starting another research project. And even when the current need is somewhat different from the earlier one, to have the results of the earlier work can still cut the costs and shorten the duration of any new effort to generate information. In sum, the interest in information handling stems from a realization that information is a resource for development and that, in the world as it is today, even otherwise highly developed countries have very inadequate means of gaining reliable access to this resource.

It is being increasingly recognized also that information is at the heart of the efforts of developing countries to forge a New International Economic Order (NIEO) and to effect a meaningful transfer of technological skills from industrialized to developing

countries. And although neither the Pearson Report of 1969 nor the Brandt Commission's recommendations of 1980 identified information as a major constraint in bridging the North-South economic gap, a close reading of both reports bears testimony to the crucial role of information in almost all the issues discussed. The United Nations Conference on Science and Technology for Development (UNCSTD) held in Vienna in August, 1979 is synonymous with failure and frustration in the minds of representatives of developing countries who attended it. But, it is not often mentioned that the same developing countries proposed a resolution, passed by the Conference, to establish a Global Information Network (GIN). This resolution has subsequently been referred to as the "only worthwhile achievement" of the Conference. The overambitious and largely impractical design criteria of the Draft Programme of Action¹ to implement the resolution do not detract from the fact that developing countries saw the final accord on GIN, and its subsequent approval by the UN General Assembly, as the only achievement of the Third World at UNCSTD. Whether or not GIN will ever emerge as an operational system is another matter entirely².

What, then, are we saying? That information is being increasingly recognized, even among the world's poorest nations, as a critical resource for development. That information, like all valuable commodities, is expensive but that unlike most economic goods it is not a perishable asset. That the economical identification, processing, and dissemination of socio-economic information, in particular, and its effective utilization by appropriate target audiences, is a vital sector of any nation's planning activity. In the remaining sections of this paper, I shall try to put this activity in the context of global, African and Nigerian efforts so that we may better appreciate the enormity of the information challenges and responsibilities facing Nigeria as a leading African nation in the world community of nations.

A final concern of this introductory material is that we should have a clear idea about what we mean by "information systems". Ideally, an information system is a mechanism to which you can address a question and which will then give you an answer based on the latest and most accurate information known to man. Close approximations to such ideal systems do exist for some subject areas where both questions and answers can be expressed in precise formulations (e.g., what is the population of a particular country?). However, most information systems, as we use the term, respond to a question by giving us, not the information directly, but references to particular pieces of literature within which we may find the answers we seek. Subjects can be defined with considerable precision so that, in response to a particular question, we may typically get five to fifty references out of a file of several hundred thousand references.

But the building of such a system requires a considerable amount of work and funds. Nothing can come out that has not first been put in. If we have a file of several hundred thousand references, it will have cost several million naira to put it together (N10/reference is not a high figure). Each relevant piece of literature has to be found; its value must be assessed and a yes/no decision taken on whether to include it; a description must be prepared to indicate who wrote it, who published it, where and when; its subject must be defined by means of words or codes that are acceptable to the system; for some systems, an abstract is written; and finally, all this information must be recorded in the prescribed manner which, for a computer-based system, implies a keyboard operation or on-line data entry with a high degree of accuracy. We can now define an "information system" as

a mechanism that delivers information that is useful to the consumer, to the user of the system. But, of course, no information system generates information spontaneously. It can only give to the user what has previously been given to it as input. What it delivers to the user is in fact a subset of what it has been given.

An information system works well if, when given a subset from the total mass of information that is within the system, it responds effectively to the selection criteria put to it by the user. A user can come to the system and say "Give me the information that is in the system and that deals with a particular subject": that is applying subject as the parameter of selection. One could also go to the system and say "Give me all the information that deals with a particular country or a particular region of the world": that is applying a geographic parameter to the selection of information from the system. One can ask the system to give information that originally came from particular sources, from particular institutions, or from particular individuals. Or one can ask an information system for information of a particular type: "Give me the information that has statistics within it", for example. So, by specifying these different parameters: subject, geographic, source, and type parameters, the user can require that the system delivers only relevant information³.

II. MISSION-ORIENTED SYSTEMS and DEVSIS

The first generation information systems - Chemical Abstracts, Referativny Zhurnal, etc. - were subject-oriented and the methods were purely manual. At that time the lead was taken by the academies of science or the scientific societies in particular disciplines. There were services in chemistry, physics, biology and, later on, services in different aspects of engineering.

During the inter-War years and immediately following the Second World War, however, one finds that there was a shift and that the initiatives for new information systems were increasingly assumed by quasi-governmental bodies, especially by national research councils. A little later, one begins to see the development of information systems whose scope is not defined by scientific disciplines but by economic activities. People began to realize that information had economic value and that it was worth investing public funds for the development of information systems. Now perhaps, the shift has gone even further: central agencies of government are taking responsibility for building information systems and for providing the funds and the investments that are needed. Sometimes, the initiative comes from the presidency of a republic, as in the case of Morocco, sometimes from a Ministry of Planning or of Coordination as in the case of Mexico and Bolivia, respectively.

The shift in responsibility away from the scientific community and toward the central government agencies has also been accompanied by a shift in the way the systems are defined. New systems are seldom now defined by discipline. The old systems - for biology, for chemistry, for physics - continue to meet important needs, but the new systems are not discipline-oriented; they are mission-oriented. The mission is some economic purpose: 'to promote the peaceful uses of atomic energy' (INIS) or 'to grow more food' (AGRIS) - missions which can be realized only if one collects information from many different disciplines, hence the mission-oriented systems are multi-disciplinary. DEVSIS is the latest of the global, mission-oriented information systems.

The idea of a development sciences information system (DEVSIS) originated from the Information Sciences Division of IDRC. Specifically, it had been the brainchild of John E. Woolston, a physicist by training, who has been the Director of the Division since 1971, as well as the Director of the DEVSIS Study Team. He brought to IDRC and to DEVSIS in particular a truly unique background of active involvement in the design and the implementation of the International Nuclear Information System (INIS) and the International Information System for the Agricultural Sciences and Technology (AGRIS). He had served as the Director of the Division of Scientific and Technical Information, International Atomic Energy Agency, Vienna, during the design and implementation of INIS and as the Chairman of FAO's AGRIS Implementation Agency Group. Nonetheless, DEVSIS is the product of a truly collaborative effort involving major international organizations comprising three from the UN family: the then Department of Economic and Social Affairs; UNDP; and Unesco; the OECD; and IDRC.

Those who are familiar with the DEVSIS Study Team's Report⁴ will have recognized that the opening paragraph of this paper derives from Chapter 1 of that Report. DEVSIS was designed as

a global system aiming at comprehensive coverage of economic and social development literature; that it should be a decentralised system relying on the participation of national governments to obtain its inputs and on a Central Unit located within a UN organization for processing and distribution; and that it should be a mission-oriented system directed towards meeting the information needs of the development community⁵.

The target user-group of DEVSIS comprises policy-makers with respect to socio-economic development at governmental and non-governmental levels, nationally and internationally; development planners; researchers and teachers; financiers; mass communicators and personnel concerned with information analysis (i.e., librarians, data analysts and information specialists of all kinds). These constitute 'the development community'. The substance of information that will be included in DEVSIS-type files is 'that information which was generated within or for the development community in furtherance of its own mission'. In other words, the information to be entered in a DEVSIS-type system will be that information generated within the territory of the input centre in the furtherance of its development mission and screened according to the perceptions of the authorities under which the input centre is operating. The forms of information most appropriate for the development community, as already defined, will comprise:

- (i) bibliographical and numerical information on current situations and their extrapolations into the future;
- (ii) information, whatever its origin, on programmes and projects, both existing and planned;
- (iii) digested (synoptic) information and the alternative sources from which it can be obtained; and
- (iv) a built-in capacity to facilitate the referral of inquiries to appropriate, more specialized information centres.⁶

The implementation of the DEVSIS design has not proceeded exactly in accordance with the design specifications. Whereas the design called for a global network of national participating centres with a DEVSIS Central Unit based in the United Nations where the system's technical, policy, and financial operations would be coordinated, what have emerged

over the years are regional DEVSIS-type information systems servicing Latin America (INFOPLAN); the Caribbean (CARISPLAN); and Africa (PADIS), with efforts underway to establish similar systems in Western Asia and South-East Asia. After a rather long battle, DEVSIS would seem to have established a permanent foothold in the UN with the small but potentially influential Development Information System of the Information Systems Unit (ISU) located in the UN - Department of International Economic and Social Affairs (UN-DIESA).⁷ In addition, DEVSIS-type information systems had existed in several countries, including Brazil, Canada, Hungary, India, Jamaica, Morocco, the Netherlands and the Philippines before the DEVSIS Study Team's Report was published.

III. THE PAN-AFRICAN DOCUMENTATION AND INFORMATION SYSTEM (PADIS)

The United Nations Economic Commission for Africa (UN-ECA) in Addis Ababa, Ethiopia, had attempted and failed for over a decade to establish a socio-economic information system for the development community of the Commission's Member States. Finally, in 1978, and with generous financial and technical assistance from IDRC, a six-man Team of experts was constituted with the following terms of reference:

1. Taking into account the policies of the UN Department of Economic and Social Affairs, the UN Inter-organizational Board for Information Systems and Related Activities, and the General Information Programme of Unesco, and taking into consideration, where appropriate, the methodology recommended by the DEVSIS Study Team:
 - 1.1 To review the existing resources and activities of bodies affiliated to the United Nations for handling documentation related to economic and social development in Africa;
 - 1.2 To visit ECA Headquarters at Addis Ababa and to assess the existing plans and programmes and the needs of ECA for the establishment of an African development information network in the light of short, medium and long-term programmes of the ECA and within the areas of its competence;
 - 1.3 To evaluate the felt needs and resources of other regional and sub-regional intergovernmental organizations in Africa;
 - 1.4 To identify through visits, the strengths and weaknesses of the organization and use of information (non-statistical) for management decision-making in a representative sample of the African governments.

2. Taking into account the findings of section 1:
 - 2.1 To recommend a definition of the subject scope and coverage of an African documentation programme responding to the interests of African governments and within the areas of substantive activity of ECA;
 - 2.2 To prepare, as a long-term (ten years) goal, the establishment of a co-operative network of African governments centred at ECA, for the identification, processing, storage and retrieval on demand of documents relevant to decision-making in economic and social development;
 - 2.3 To outline, as a medium-term (four to six years) plan and indicative budget, the establishment at ECA of the resources (trained personnel, computer facilities and other equipment) that would provide the minimum necessary base for launching such a network and for managing the relevant documents received by ECA or produced by ECA and its affiliated institutions and programmes;
 - 2.4 To define a short-term (two years) plan and budget, within the known and anticipated resources of ECA, maximizing the capacity of ECA to manage the documents that it now receives or produces and to introduce documentation services in support of decision-making within the Secretariat and, to the extent possible, in African States;
 - 2.5 To prepare and deliver to the Executive Secretary of ECA a report and recommendations, including estimates of the resources required for future work, on the establishment of an African development information network.

I had the honour to serve as an IDRC consultant on the Team which worked from January to April, 1979 to produce a 253page design document.⁸ Fortunately, our report was approved by the ECA Council of Ministers, the OAU and the UN General Assembly. PADIS is now operational in Addis Ababa with continuing technical and financial support from IDRC, a substantial grant from UNDP to purchase two minicomputers and a total commitment by ECA to invest funds and personnel to ensure the successful implementation of the system.

PADIS was designed taking into full account the peculiar political, economic, infrastructural and personnel resources of the region. Data on these vital indicators were collected and analysed by the design

Team after extensive field work in most of the Member States of ECA. A Coordinating Centre based at ECA Headquarters in Addis Ababa has started to function since January, 1980. With the further development of sub-regional and national information-handling capabilities, the system would be decentralized with various functions being taken over or shared by sub-regional, intra-African, or national units (see charts). Devindex Africa is expected to be the system's major bibliographic output which, it is hoped, would eventually be an aggregate of the contributions made to PADIS by all participating centres at all levels.

IV. TOWARDS A NIGERIAN INFORMATION POLICY

Neither DEVSIS nor PADIS can achieve its stated objectives without a certain measure of commitment and active participation at the national level. Indeed, DEVSIS and PADIS have generated so much interest because countries were thinking nationally about the problems that the systems and their co-sponsoring organizations were attempting to tackle at international levels. Besides stressing the crucial role of national nodes as often as necessary throughout, the DEVSIS Report devoted a chapter (Chapter 23) to addressing the functions and responsibilities of national participating centres. Similarly, PADIS provides guidelines, at 1979 costs, on the financial implications of establishing national information infrastructures and of participating in any regional or international information programmes. In PADIS, the national participating centre will identify and collect nationally-produced publications, reports and documents which fall within the defined scope of the system. It will record information about this literature in the standard format approved by the system and regularly transmit records to the Coordinating Centre in Addis Ababa. It will receive the printed output (Devindex Africa) from the Coordinating Centre which represents the cumulative Africa file, and it may receive the file itself, or a requested subset of it, on magnetic tape. It will make PADIS outputs available to users within its national borders.

The mechanism just described raises the crucial issue of confidentiality. The unrestricted circulation of certain confidential documents that the Team of Experts which designed PADIS considered to be desirable basic input material for the system raised the question of security for the countries which produce them. The question then is: What kind of acceptable arrangement can be worked out in this regard?

Fortunately, this problem had been recognized and addressed at the 'Consultative Meeting on Information Needs for Development, Planning and Investment Agencies in Africa' held in Nairobi from 9-12 April, 1979.

The Meeting had been convened to bring together members of the Team of Experts working on the design of PADIS and its target user community in both the public and private sectors across Africa. One of the ten topics on which the Team wanted to have the benefit of the Meeting's advice concerned the 'Confidential Nature of Certain Documents'. On this,

The Meeting recognized the right of African States to determine the degree of confidentiality of their internally-generated information and their right to establish screening mechanisms as a condition of their participation in the sharing and transfer of information across national boundaries. However, the Meeting strongly urged ECA to prepare guidelines to assist member States in establishing their respective criteria for the classification of documents according to varying degrees of confidentiality.

Without compromising the security of African countries, it is recommended that the whole area of confidential material be reviewed so as to make as much information as possible available to the proposed information network. ⁹

We submit that this arrangement is as equitable and realistic as any that can be devised.

Clearly, no national participating centre can contribute effectively to PADIS unless it has the requisite infrastructural, personnel and financial resources to do so. But above all, there has to be a political and an organizational framework in each participating country in order to make participation meaningful and mutually rewarding. Nigeria has been fortunate to have such a framework statutorily enshrined in the objectives and functions of the National Library of Nigeria as spelt out in the National Library Decree of 1970.

IDUPOM Research Project

In 1977, the National Library of Nigeria embarked on a research project to identify and analyse the processes of information flow to, and its utilization by, policy-makers in the Federal Civil Service (IDUPOM Research Project). This was done in the firm belief that access to, and the utilization of relevant information by Nigerian policy-makers at the federal level would constitute a significant contribution to Nigeria's programme of rapid socio-economic development as articulated in the 1976-80 Third Development Plan. Specially, the IDUPOM Research Project was launched because the National Library was convinced, in the (modified) words of Batscha ¹⁰ that

Until specific audiences within developing countries are identified and the information needs of each are ascertained, efforts at designing effective information systems will continue to be governed by the funding agencies, researchers and the priorities of information specialists rather than being a reflection of the identifiable information and policy needs of the utilizers in these countries.

I had the honour to design the Project and to lead a team of Nigerian researchers and consultants in the long, painstaking processes of data-collection and analysis culminating in the final report of the Project: The Perception and Utilization of Information by Policy-Makers in Nigeria ¹¹ which was presented to the Director of the National Library of Nigeria last January. Thus, Nigeria has the results of the first comprehensive study in any developing country of the most vital ingredients of a national information policy. We have something that should constitute a point of reference by future researchers on this important subject; we have something that would be the basis of a Nigerian information policy.

The Road Ahead

I am convinced that Nigeria's road ahead in evolving a national information policy is relatively clear now - something that could be said for only a handful of nations, developing or industrialized. My participation in the design of PADIS has been cited earlier on in this paper. Indeed, my involvement in that exercise was as a result of meeting an IDRC staff at a Unesco-sponsored seminar where I had been invited to present a paper on the IDUPOM Research Project. ¹² As everyone knows by now, I am currently spending my sabbatical year as Program Advisor to the Information Sciences Division of IDRC. My major responsibility in that capacity is threefold:

- (a) evaluate DEVIS-type project proposals submitted to IDRC from developing countries for possible funding;
- (b) monitor specific on-going DEVSIS-type information systems funded by IDRC; and
- (c) evaluate IDRC's present involvement in DEVSIS-type activities and recommend future courses of action.

My year at IDRC and the consultancies I have been involved in have provided a vital learning experience for me and I should most willingly make that cumulative learning experience available in every possible manner to Nigerian efforts to evolve a national information policy. The essential ingredients of such a policy are contained in the "Summary of Findings and Implications for Action" constituting Part II of the Report submitted to the National Library in January.

Some people may wonder why the National Library has confined its initial research efforts on this subject to the Federal Civil Service. Besides the obvious necessity to restrict the study in terms of scope and time, the impact of a socio-economic information system would be expected to be strongest and most visible among those who formulate and execute a nation's policy. I shall illustrate.

During the data-collection stage of the IDUPOM Research Project, members of the Research Team witnessed again and again the enormous volume of papers that federal civil servants had to read in the course of their day-to-day tasks. We would probably all agree that civil servants, especially those in the upper segment identified in the study as the 'Higher Civil Service', read the greatest number of papers on the greatest variety of subjects. Fears may be expressed, therefore, that a Nigerian version of PADIS will only place more papers on the desks of people who do not have the time to read the documents already there. The results of the IDUPOM Research Project assure us, however, that such fears are not justified.

Why is there so much paper on the desks of public policy-makers in Nigeria? Our results suggest very strongly that they keep it there because, if they cleared it away, they would have no assurance that they could find it again when they needed it. But if they did have an effective information retrieval system, they would have no need to keep paper on their desks; they could just call for what is relevant to their everyday policy-making tasks.

Nigerian civil servants also find themselves reading documents that are somewhat relevant to their needs, but not entirely so. They are not sure that the documents contain the information they need. Since they often have no way to check quickly what else may exist, they persevere only to be frustrated when they discover that their reading has not helped very much. They would read more willingly if they had some assurance that the document in their hands contained the information that best responded to their needs. And an information system should give them just such confidence.

Finally, bearing in mind that the IDUPOM Research Project was funded entirely by the Federal Government of Nigeria, I am confident that Nigeria also has the financial resources to back up her intellectual and organizational endorsements as well as her political commitment in this vital endeavour. PADIS can look to Nigeria for leadership and inspiration to demonstrate what can be achieved within national borders in the context of ECOWAS, the West African MULPOC ¹³ of ECA, the OAU and

in the community of Third World countries generally. Given the strong commitments Nigeria has already made in this area, there is every assurance that Nigeria will continue to play a leadership role in information systems design for socio-economic development.

Acknowledgement

I would like to express my gratitude to the Federal Government of Nigeria which, through the National Library of Nigeria, has funded my participation at this important seminar. My gratitude also goes to my current employers, IDRC, which has released me from my crowded schedule to present this paper and to attend other meetings during the week. Thank you very much for listening to me.

V. REFERENCES and NOTES

1. UNCSTD Draft Plan of Action, A/CONF.81/L.1 19 July, 1979. p.17.
2. Sardar, Z. "Between GIN and TWIN: Meeting the Information Needs of the Third World". Aslib Proceedings, 33(2): 53-61, Feb.1981. Sardar argues that GIN will never materialize as an operational information system. He proposes instead a Third World Information Network (TWIN) based on the resources of the Middle Eastern countries.
3. Woolston, John E. "International Cooperative Information Systems". In: International Cooperative Information Systems, Proceedings of a seminar held in Vienna, Austria, 9-13 July, 1979. Ottawa, IDRC, 1980. pp. 13-14.
4. DEVSIIS: a Preliminary Design of an International Information System for the Development Sciences. Ottawa, IDRC, 1976. 245 pp. (IDRC-065e).
5. *ibid.*, p. 13.
6. *ibid.*, pp. 35-6. A more comprehensive definition of the scope of DEVSIIS is contained in Chapters 4 and 5 (pp. 31-37) of the study.
7. The battle culminated in Unesco contracting the reputable Professor W.L. Lancaster of the University of Illinois Graduate School of Library Science to evaluate ISU as a basis for the UN General Assembly decision to incorporate ISU's budget into the general budget of the UN on a one-year trial basis.

8. DEVSIIS-Africa: a Pan-African Documentation and Information System for Social and Economic Development. Ottawa and Addis Ababa, IDRC and UN-ECA, 1979. 253 pp. (The Terms of Reference are reproduced on pp. 133-4 of the report).
9. DEVSIIS-Africa ... op. cit., p. 227. A complete record of participants at the Meeting, the speeches made by invited Ministers and the Executive Secretary of ECA, and the recommendations adopted at the Meeting are found on pp. 226-248 of the report.
10. Batscha, Robert M. "Helping Policy-Makers Use the Results of Economic and Social Development Research". Far Horizons, 10(4): 7-9, 1977.
11. Aiyepoku, Wilson O. The Perception and Utilization of Information by Policy-Makers in Nigeria; a report to the Director, National Library of Nigeria. Lagos, 1980. 442 pp.
12. Unesco and the University of Ghana's School of Library and Archival Studies had jointly organized a "Seminar on Information for Economic Planning and Development for the Africa Region" in Legon, Ghana, 24-28 July, 1978. My paper: "Organizational Considerations in the Information/Utilization Mode of African Policy-Makers" derived mainly from the IDUPOM Research Project and had a major input from the Director of the National Library of Nigeria. It was there that I met Shahid Akhtar who was to become the Leader of the Team of Experts contracted to design PADIS.
13. MULPOC is an acronym for 'Multinational Planning and Operational Centre'. Five MULPOCs were created by ECA to facilitate the delegation of certain specified powers at the sub-regional level. The West African MULPOC has its Headquarters in Niamey, Niger.

WOA/mjg
May, 1981