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INTEGRATING INFORMATION SYSTEMS/TECHNOLOGY IN LOCAL/REGIONAL DEVELOPMENT PLANNING

31 October-4 November 1988, Singapore

United Nations Centre for Regional Development
Asian Mass Communication Research and Information Centre
National Computer Board of Singapore
Among problems in the implementation of information systems/technology (IS/IT) in developing countries, building institutional capabilities is the most important. In order to better understand the developing countries' experiences and draw lessons for future efforts, the United Nations Centre for Regional Development (UNCRD) and the Asian Mass Communication Research and Information Centre (AMIC) jointly organized the meeting. The National Computer Board (NCB) of Singapore cosponsored the meeting.

The lessons from the IS/IT projects give priority to a number of recommendations. First, appropriate technology and methodology should be developed in a participatory manner to aid local villagers in systematically identifying development needs within their community. Second, communications materials on the use of IS/IT in local and regional planning should be developed. Third, there is a need to establish a clearinghouse for free software packages, to review operational packages, and to investigate a database of professional resources in IS/IT for support of local and regional planning. Fourth, a network of IS professionals should be developed to diffuse information about IS/IT between national governments. Fifth, attention should be given to the identification of training requirements for purposes of integrating IS/IT in development planning. Sixth, planning agencies need assistance in the identification of appropriate technology, as well as in implementation and training in the IS/IT field.

In organizing the meeting, the organizers made a special effort to invite individuals with a broad spectrum of experience. UNCRD and AMIC sought and were successful in enlisting the participation of IS/IT project managers and professionals, community, local, and regional planners, scholars, and representatives of donor agencies.

Against the background of stimulating welcome and keynote addresses, and a number of resource papers, country situation reports, and case studies, the meeting engendered a lively discussion. It is expected that this report and efforts to follow up on its recommendations, will help sustain the momentum of the meeting.

We offer our grateful thanks to AMIC for coorganizing the meeting and for the gracious hospitality provided to the meeting.

We are grateful to NCB of Singapore for cosponsoring the meeting.

We would like to thank the cooperating organizations: Department of Information Systems and Computer Science, Department of Sociology, and Institute of Systems Science, National University of Singapore; Regional Office for South East and East Asia, International Development Research Centre (IDRC); United Nations Development Programme (UNDP), Malaysia, Singapore, and Negara Brunei Darussalam; and General Information Programme, United Nations Educational, Scientific and Cultural Organization (UNESCO/ PGI).

We are thankful to all the participants for having contributed to the success of the meeting.
The report was compiled by J. S. Edralin, Information Systems Planner, UNCRD. Important inputs were provided by the rapporteurs and the Drafting Committee members.

23 March 1989

Hidehiko Sagami
Director
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INTRODUCTION

The Expert Group Meeting on Integrating Information Systems/Technology (IS/IT) in Local/Regional Development Planning, held in Singapore from 31 October to 4 November 1988, was the fourth such meeting since the initiation of the Research Project on Information Systems by the United Nations Centre for Regional Development (UNCRD). Jointly organized by UNCRD and the Asian Mass Communication Research and Information Centre (AMIC) and cosponsored by the National Computer Board (NCB) of Singapore, the meeting provided the occasion for development planners, scholars, and information systems project managers and professionals to assess the critical success factors in IS/IT implementation through a review of IS/IT programmes and projects in Asian developing countries. The meeting was also attended by representatives of international and regional organizations and other agencies of the United Nations system.

The speakers at the opening ceremony were: Hidehiko Sazanami, Director, UNCRD; Vijay Menon, Secretary-General, AMIC; and David M. Thorup, Deputy Regional Representative, UNDP Malaysia, Singapore, and Negara Brunei Darussalam, who delivered the welcome addresses; and Tan Chin Nam, Chairman, NCB, who delivered the keynote address. Texts of the addresses are presented in this report.

The following purposes were set down for the meeting:

(1) To bring together the knowledge and experience of IS project managers, IS professionals, local/regional development planners, and scholars for the purpose of reviewing strategic problems and issues of integrating IS/IT in local/regional development planning in developing countries;

(2) To review methodologies, approaches, trends, and practices concerning the application of IS/IT in local/regional development planning;

(3) To identify "lessons learned" based on country regional planning situation analyses of information needs and on IS project case studies, and to discuss ways these lessons can be applied during IS project design and implementation;

(4) To discuss the implementation issues that impact the successful integration of IS/IT in local/regional development planning;

(5) To make recommendations to planners for integrating IS/IT in local/regional development planning;

(6) To make recommendations to the meeting sponsors with respect to future research and training activities in IS.

Discussion at the meeting was organized around five themes:

Theme I: Country Regional Planning Situation and Outlook in the Context of IS:
Theme II: IT-Based Local/Regional Planning: Selected Country Case Studies;

Theme III: Strategies to Guide the Use of IS/IT in Local/Regional Planning;

Theme IV: IS Applications in Planning; and

Theme V: Critical Success Factors in the Development and Implementation of IS/IT in Local/Regional Planning.

Field trips to the NCB of Singapore and the Science Centre of Singapore were arranged. Participants were interested in what could be learned about Singapore's National IT Plan, IT applications, and NCB's programmes.

To convey the urgency of implementing IS/IT in local/regional planning in developing countries, the participants put forward a number of conclusions and recommendations. The preparation of the conclusions and recommendations was under the direction of the Drafting Committee, of which Jerry C. Coiner was chairperson.

The closing addresses were delivered by Hidehiko Sazanami, Director, UNCRD, and Benjamin V. Lozare, Joint Deputy Secretary-General, AMIC.
SUMMARIES OF PRESENTATIONS AND DISCUSSIONS
SUMMARIES OF PRESENTATIONS AND DISCUSSIONS

THEME I: COUNTRY REGIONAL PLANNING SITUATION AND OUTLOOK IN THE CONTEXT OF INFORMATION SYSTEMS

"Information Systems and Technology for Regional Planning in Malaysia," by Nik Ibrahim bin Nik Mahmood

This paper looks at the present information systems (IS) and information technology (IT) at the state/regional level in Malaysia by focusing on the work of the Regional Development Authority (RDA) in South Kelantan. The South Kelantan Development Authority (KESEDAR) has responsibility for monthly reporting on activities in the agricultural, manufacturing, forestry, services, trade, and Industry sectors. It is, however, only one of a number of organizations at this level that are linked with state/regional planning -- such as the State Development Office (SDO) and the State Economic Planning Unit (SEPU) which also have major roles to play in planning. The RDAs, such as KESEDAR, are fairly new; they only exist in seven states at present, and are all ill-equipped, particularly in terms of their ability to obtain adequate data for planning and operational purposes.

The author points out that the central agencies have developed computer-based IS (most notably, SETIA) to monitor the activities of the RDAs. In the case of KESEDAR, a significant amount of data (i.e., on project management and personnel management) is required for day-to-day management and for the preparation of documents required by the central agencies. To be successful in carrying out their mission, the RDAs need to develop IS and improve data collection, analysis, and reporting.

A good description of the structure and functioning of the Malaysian national planning system, planning at the state/regional level, and the roles and specific problems of state/regional agencies such as KESEDAR, is provided. Major problems identified in the present IS/IT systems are the lack of data, delays in the provision of necessary data to the responsible organizations such as KESEDAR, lack of the capacity and skills to organize data gathering and analysis, as well as presentation of data and information. This is due to the diverse sources of data that have to be used and due to a lack of computerization; much of the data are still manually processed. To meet these problems, an integrated information network is needed among the various state-level agencies which have the responsibility of collecting and analysing information, as well as adequate coordination between such agencies. In addition, both training and hardware are urgently needed at this level of government, as the present RDAs are inadequately equipped and lack trained staff. Policy questions, such as the location of hardware, the need to introduce timely and more regular reporting, and, above all, coordination among agencies, all need to be urgently addressed. Finally, the question of information security is raised. In Malaysia, this presents a major constraint on access to data. In summary, the RDAs face significant problems in implementing their IS. Some of the problems are organizational in nature -- no systematic procedures for collecting data and lack of consensus on what type of data to collect. Other problems are technical -- lack of equipment, software, and trained
personnel.

As a first step, the establishment of an integrated information network among the various state-level agencies is proposed. Such a system will help allocate the heavy burden faced by KESEDAR in its role as coordinator, facilitator, promoter, and implementor for regional development. There are, however, organizational and technical issues that need to be resolved for such a system to meet its objectives. Valuable insights are provided into the problems of introducing and utilizing effectively IS/IT at the subnational level in Malaysia. It is a well thought-out and practical case study of planning at this level of government in Malaysia, and raises problems applicable to other countries to different degrees, particularly the lack of coordination of various government IS/IT efforts.

"Integrating Information Systems/Information Technology in Regional Development Planning in Malaysia -- A Quick Review," by Abdul Rahman bin Jamal

This paper provides an outline of the present status of IS/IT in Malaysia as of 1988. Placing the importance and need for comprehensive and reliable IS/IT systems in the context of the country's New Economic Policy with its emphasis on redistributing economic benefits to all parts of the population allied with economic growth, the paper first examines the present IS/IT activities in Malaysia and then looks at major issues, constraints, and deficiencies in the systems.

Currently, the major issue lies in the inability to obtain adequate socioeconomic data at the subnational level. What data are available are too varied for the Department of Statistics (DOS) to handle and other sources are too partial and outdated. This affects successful subnational, sectoral, and regional macroeconomic analyses, analysis of the impact of the government's distributional policies, as well as the ability to provide regional modeling. Suggested improvements include the strengthening of the work of macroeconomic and policy planning at the state/regional level and more analytical work by the agencies responsible for national policy planning. There is also a need to introduce uniform standards, concepts, and definitions across organizations involved in data collection, to document and update available data, to effectively disseminate data to users, and to improve data bases so that they move from being, as at present, too specific or fragmentary to a stage where they can be of general use. Particular emphasis is placed on building up the analytical capacity of data users so that the pertinent questions can be asked and analysis carried out.

This paper mirrors many of the experiences found in other countries in the present inadequacy and inaccuracy of data, the need for greater institutional coordination to obtain consistent data, the need for training in the use or application of data, and, finally, the need for general uniform standards, concepts, and definitions. The paper clearly identifies the needs policy-wise for these in Malaysia, and the steps that need to and can be taken, for increased future coordination and training.
"Use or Potential of Information Systems/Technology in Regional Planning in the Philippines," by Daisy Elena F. Ano

In the recent past, the government has attempted to decentralize planning as indicated in the Medium-Term Philippine Development Plan 1987-1992. IS/IT have been attempted or are being used in the planning, programming, budgeting, and monitoring and evaluation aspects of regional planning.

The major constraints are in the areas of: (a) Data production and utilization; (b) institutional structures; (c) technical requirements; (d) political and social aspects; and (e) policy issues.

There are gaps between the user and provider, with the existing highly centralized statistical system highlighting the problem. Official sources are not disaggregated to the levels necessary for regional planning.

There have been several IS which have been undertaken in isolation on a project-specific basis. Some of these efforts are still ongoing. The Integrated Regional Information System (IRIS) project initiated by the Regional Development Staff, National Economic and Development Authority (NEDA), with support of the United Nations Development Programme/International Bank for Reconstruction and Development (UNDP/IBRD), has completed the project period. IRIS was conceived to address two problems:

(1) The limited set of information available at disaggregated levels; and

(2) The absence of an organization at the small area level charged with compilation and collation of information.

The main goal, which was to meet critical needs of disaggregated regional planning, was to establish an integrated regional information system in all regions, except the National Capital Region. A review of the project has shown predominance of computer-related activities; however, the identified problems which were meant to be addressed by the project cannot be resolved by an integrated information system. Other ongoing IS-related projects include: (a) Regional Statistical System Development (RSSD) Project; (b) Land Use Information Systems (LUIS) Project; (c) Regional Development Information System (REGDIS); and (d) Regional Project Monitoring System (RPMS).

These projects are conceived by different agencies with different donor support. Among the major issues identified are the lack of project continuity, coordination, and compatibility.

A national policy on IS is required. Few of the projects referred to above have had a positive effect of creating an awareness of IS/IT capability in regional planning and/or filling specific information needs. A stocktaking of the ongoing situation is now necessary to prepare an IS plan, with objectives, time frames, and project purposes identified.

"Regional Planning Situation Report on Sri Lanka," by R. B. Morapaya

This paper, like many at the meeting, emphasizes the importance of seeing the development of IS/IT within the context of the planning system.
that has been developed. In Sri Lanka, regional planning has been charac-
terized by the policy of Integrated Rural Development (IRD) implemented
at the provincial and district levels, reflecting many ad hoc decisions
and local peculiarities. Some regional planning in the form of district
projects has been practiced, but these projects have been planned and
implemented on a piecemeal basis and, therefore, whatever data and informa-
tion have been gathered for project-specific purposes are disorganized and
unsystematic. Elaborate frameworks exist for developing projects which
aggregate to form the overall planning system in the country. The rather
complex organizational structures developed for socioeconomic and physical
planning are also reflected in the way formal IS/IT systems have been
developed.

Another critical step may be to define "the regions" using criteria
which would facilitate the development of each region, but which must be
related to national objectives. These preliminary steps will help deter-
mine not only the type of additional data and information to be gathered,
but also facilitate the development of appropriate information system(s)
for national, regional, and local-level planning.

Sri Lanka appears to have no well-organized overall planning system at
the national level where planning is focused on a single agency, i.e., the
National Planning Division of the Ministry of Finance and Planning. At
present, each ministry is doing its own planning in isolation, and in con-
sultation with the National Planning Division only when necessary. Under
these circumstances, for IS/IT to support planning at the national, re-
gional, and district levels, an organization may be required to coordinate
and integrate the planning apparatus already in existence in each ministry
into one systematic planning mechanism, with the National Planning Division
playing a leading role. This will enable systematic channels of communica-
tion to be established and institutionalized.

Morapaya identifies five IS projects: The IRDP Monitoring and Infor-
mation System, a pilot project for a data system for decentralized planning
in the Kalutara District, the Sri Lanka land use and policy information
system, the Hambantota local planning IS, and the Nuwara Eliya monitoring
IS system. Donor agencies include the Netherlands Management Development Foundation (MDF), Economic and
Social Commission for Asia and the Pacific of the United Nations (ESCAP)
and United Nations Educational, Scientific and Cultural Organization
(UNESCO), Food and Agriculture Organization of the United Nations (FAO),
Asian Institute of Technology (AIT), and Asian Regional Team for Employment
Promotion, International Labour Office (ILO/ARTEP), respectively, for these
five projects.

The real problem in evaluating IS in Sri Lanka involves coordination
and the need for a central initiative linking these projects, and estab-
lishing them comprehensively constitutes an obvious constraint. All in
all, the rather decentralized system of regional planning in Sri Lanka
seems to generate uncoordinated initiatives and clearly illustrates the
dilemma as was the case in the Philippines, of establishing IS which are
useful to decentralized plan making.
DISCUSSIONS

Recognizing fully the potential of IS/IT in regional development and planning, the participants pointed out that the critical issue is not whether the new technologies should be introduced and adopted for local or regional planning, but rather how they should be introduced and adopted to ensure their effective and optimal utilization. In this connection, the distinction between IT -- in terms of readily transferable hardware and application software available off-the-shelf -- and IS -- which has to be developed, adapted, and adopted by local organizations and managers -- was brought out in the course of the discussions. While IT can be transferred from a developed country to developing countries, developing appropriate IS locally which can be put to meaningful use for regional planning remains a critical task.

The issues which regional planners have to tackle in developing appropriate IS can be broadly classified into three categories:

(1) Policy Issues

Transfer of IT, along with other new technologies, and their adoption is basically a policy issue. It is concerned with the question of choice of a relevant technology, expertise, and application know-how, considered to be appropriate to the development needs of different countries. Some of the countries have so far been unable to convert ad hoc and piecemeal computerization efforts into a concerted IT policy, which caters to the needs of local- or regional-level development. Often, the choice of technology is in fact dictated by donor agencies which make available the technology, the expertise, and also the know-how; but technology development is not sustained as the know-how cannot be absorbed by the recipient. This, in fact, leads to high wastage of hardware and human resources in the developing countries.

(2) Institutional Issues

Development of IS/IT is critically dependent on political and social commitment of the governments and the organizations specifically concerned with local and regional planning. To be effective, IS/IT must be accepted internally within the organization applying it, and -- it should also be accepted within the larger bureaucracy within which the organization operates as well as by the political and public leaders. Existing government legislation (e.g., the Official Secrets Act in some countries) and the traditional bureaucratic culture, it was pointed out, impede the free flow of information. Public awareness-building, administrative improvements, and reorientation of attitudes of bureaucracy, therefore, are important prerequisites for development of effective IS. Transparency of IS at local and regional levels would generally lead to greater public participation in developmental decision making and reduction of corruption or malpractices.

(3) Technical Issues

(a) The need for human resource development was emphasized by the participants, particularly in upgrading the skills of local and regional planners, government administrators, and public leaders. In view of the resource crunch faced by most governments,
supportive linkages between the public and private sectors should be encouraged and fully tapped.

(b) Inadequate infrastructure, particularly the undeveloped telecommunication and power facilities, have constrained operation of large IS and networks. It was, however, felt that with the advent of more powerful microcomputers which can serve as workstations at the local level, it may be possible to partially resolve this problem.

(c) More important, however, is the question of ensuring reliability and regularity of data flow to feed the IS. There is little justification for building up very large and costly IS if data reliability cannot be ensured.

(d) Standardization and integration of data is another dimension of the technical problem faced by local and regional planners. With an increase in the number of planning institutions and sectoral agencies implementing development programmes, many types of data are being collected from diverse sources. Even small companies are known to have faced the problem of data standardization and integration. System efficiency and benefits could increase dramatically, if common data standards would be established and integrated horizontally across various development agencies at the local and regional levels.

THEME II: INFORMATION TECHNOLOGY-BASED LOCAL/REGIONAL PLANNING: SELECTED COUNTRY CASE STUDIES

"The Computerization of the Singapore Civil Service," by Lee Kwok Cheong

This paper describes a national initiative to computerize the Singapore civil service called the Civil Service Computerization Program (CSCP). This initiative was unique in several ways. First, it was part of an overall plan by the Government of Singapore to use IT as a driving mechanism for economic development. The administration of the CSCP was the responsibility of the National Computer Board (NCB), a statutory board established to spearhead the overall IT effort. Second, it involved the government making significant investments in IT in the CSCP, where the return on these investments was not particularly emphasized at the beginning stage. Third, it involved the NCB taking a leading role in establishing a set of strategies to ensure success of the programme.

One of the most interesting aspects of the implementation of the CSCP is the balance maintained between decentralization and centralization of key IT activities. The planning, prioritization, development, and funding of IT application were decentralized to the ministries. This was necessary to reduce the tremendous backlog applications that had developed and to ensure that the right types of systems were developed. However, the recruitment, training, and career development of IT professionals were controlled centrally through the NCB. In fact, a separate, private company was established to employ these professionals in order to create compensation and promotion policies independent of civil service regulations.
Without such a policy, it would have been impossible to mobilize the human resources necessary to carry out the programme.

The success of this programme has been remarkable to say the least. The number of experienced IT professionals has grown tenfold to 8,000, and thirty-two IS departments have been established and over 130 applications developed. It is an outstanding example of what can be done when a clear vision is mapped out by the leadership of the country and resources mobilized to carry out that vision. Can such a programme be replicated in other countries? Certainly, Singapore has a unique set of characteristics which enabled this programme to be successful, the key one being the high level of government commitment and responsibility. It is unlikely that IT will have such a high priority in other countries. However, the strategies adopted by NCB to implement the CSCP should be examined for their applicability to other IT initiatives, particularly with respect to IT planning and human resources management of IT professionals.

"Development of an Urban and Regional Planning Information System: A Case Study," by Roslan Zaris, Dading Sugandhi, and Peter Gardiner

Zaris presents a case where efforts are being made to increase and supplement data already collected, and to adapt and modify an existing IS to serve a new group "of potential users." The existing IS was meant for the National Urban Development Strategy (NUDS) project and had already served its purpose. The data are now stored in the computer at the Directorate of Urban and Regional Planning (DTKTD). The question here, therefore, is who are the potential users and for what purpose are the data to be used?

Users' questions must be answered prior to taking such steps as decentralizing the data bank and implementing the system through a network, training the necessary personnel, and expanding the existing data base. The paper provides only a vague answer to these questions, the potential users are "users within the DTKTD as well as ... other potential users," and their purposes are to "support the implementation of the NUDS strategy as well as any modification that might prove necessary with the passage of time."

Although some rough planning has obviously been done to modify the system and to train the personnel, there seems to be a lack of commitment on the part of the government to see the project through, and efforts to institutionalize the NUDS have achieved only limited success "largely due to a reluctance on the part of government to adopt the strategy as an overall process."

In order to ensure that the existing data base and IS are modified to serve the purpose of overall development planning at national, regional, and district levels, the critical first step is to get the government's commitment to the project. For this purpose, the support and sympathy of those who have political influence at all levels -- national, regional, and district -- will be necessary. Action plans for implementation, as already conceptualized in the paper, could then be comprehensively drawn up and subsequently implemented.
"Information System for Rural Development in Thailand," by Kitisak Sinthuvanich

The Rural Development Information System (RDIS) is a national system with centralized processing and distributed data collection for planning and monitoring of rural development. Although the RDIS is designed to cover all rural communities in the country, the data are mainly utilized at the regional (provincial) level to plan and monitor rural development programmes. The system was set up in 1982 but it was only in 1984 that data from all rural communities in the country were fed into the system. The RDIS is currently undergoing decentralization of data, preprocessing activities, and some data analysis (using microcomputers) to the provincial levels.

The RDIS is interesting in that the system itself is a component of the central government's Sixth National Plan, 1987-1991, pointing to the central government's recognition of the close relationship between planning and information, and the essential need for high quality data to support planning, especially if modeling is to be used.

The RDIS represents an intermediate stage, institutional level national application. It is evolving into a series of rural development planning tools, focused on a highly structured data base. Some attempts will probably continue to migrate the applications down the administrative hierarchy.

One problem encountered is that the implementation of IS/IT may interfere with the ongoing tasks of the planning agency.

"SETIA -- An MIS Tool for Promoting Development in Malaysia," by Mohd. Yunus Tamin

Yunus Tamin addresses a national level IS for support of the financial and managerial control of Malaysia's five-year development planning process. The level of systems development represented in SETIA (acronym for System Economic Planning Unit, Treasury, Implementation Coordination Unit, and Accountant General's Department) is that of an intermediate, national level IS application.

SETIA solves a number of development project management and monitoring concerns of the central government. Addressibility, however, needs considerable improvement as far as development programmes outside the plan framework are concerned. Even with respect to plan framework, socio-economic modeling and analysis, as well as resource and strategy optimization, could be improved.

At the national level, there are well-organized IS/IT. At the state level there is also a well-organized IS, but less IT. At the grass root level, the IS is less organized to meet local requirements and better organized to feed state and national information needs. SETIA can be a very good model for IS/IT in support of development planning, if grass root level information is organized to a higher extent.
"The Role of Information Systems in Development Planning in India: A Case Study of DISPLAN on NICNET," by N. Seshagiri

NICNET (National Informatics Centre Network) is the Government of India’s primary national information system. It is used for a number of national-level functions, including support of the planning process at the national, state, and district levels. As NICNET has developed, it has penetrated to lower administrative levels; currently it supports data flows between the centre and the states. The system’s data bases are now being disaggregated to the district level.

Although technologically sophisticated, NICNET’s main planning function currently seems to be in moving timely standardized data about the rural areas to the state and central government authorities. Little mention is made of the provisioning of planning support tools over the system for use by local planners.

NICNET represents an advanced level institutional application of IS/IT to planning. As a model for other governments, the large and lumpy investments in technology may be prohibitive. However, the concept of a centrally-planned approach to IS/IT that recognizes the relationship -- especially in the data management areas -- between national, state, regional, and local planning may be of interest to organizations in the early stages of IS/IT implementation.

"Delivering Relevant Development Information to the Rural Poor," by Erasmus D. Monu

This paper deals with the experience of the Division of International Training and Outreach of the International Institute of Rural Reconstruction (IIRR), Silang, Cavite, Philippines at the village level. The IIRR experience deals with developing a participatory development planning model covering all stages of the planning cycle from problem and resource analysis, objectives setting, selection of strategies and approaches, through programme and project identification and formulation to prioritization, decision making, implementation, and monitoring and evaluation.

Emphasis is placed on the development of an IS at the village level. The steps are guided by an Operational Research Framework which consists of: (a) the rural poor; (b) the service/support systems; and (c) development agencies/organizations.

A rural reconstruction worker initiates a dialogue with the rural poor by: posing questions; sharing relevant information; and asking questions about implementation.

Through the above discussions, villages identify problems and solutions. A task analysis tries to answer the following questions: What is to be done? By whom? When? How?

A review of the working of the model has revealed that: (a) The IIRR has failed to provide adequate information; (b) few technological packages are available to villages; (c) the IIRR has not worked out a systematic method for packaging; and (d) the relevance of the channels of communication is yet to be established.
Since development of an information system for regional planning has its links to local-level planning, people's participation and rural development are quite relevant. In the context of regional planning in developing countries, the experience gathered through IIRR projects needs to be given special consideration. It is necessary, however, that these experiences be shared with the regional and local government agencies to be incorporated into the overall process of developing a regional and local-level information system for planning.

In view of the necessity to replicate the planning process, it may be important to assess the limits of sophistication required. All the problems of a village cannot be solved within the village. Village-level planning has to be logically linked to the regional and even national problems, depending on the magnitude of involvement required. Further methods need to be developed to link the IIRR's village-based experience with the regional planning and information network.

"The Community Information and Planning System (CIPS)," by Rachel V. Polestico

The system described in this paper is designed to capture data at the community level to be used by the villagers in the planning, implementation, and monitoring of local projects. The system could be described as fairly advanced since it has passed through a pilot stage and is now being replicated in other communities in the Philippines.

CIPS is seen as a framework that could integrate training, community organizing, and socioeconomic projects in the villages so that they could produce the desired results of building an enlightened, united, and active citizenry. The core of the CIPS model is the use of the techniques of community organizing in order to motivate and mobilize the communities to undertake participatory research, planning, and project implementation. These technical abilities are taught first to members of the communities through committees with the requirement that the results of their research, planning, and projects should constantly be reported back to the community through constant consultations.

From the pilot studies and replication experiments in thirty villages, it was found that, through CIPS, the people in the villages are able to make decisions based on information which they gather through research, mobilize resources from within and without to implement their plans, and strengthen their organizations by defining their visions and by working together. Through CIPS, the people are able to solve their problems and make possible what they have decided on, dreamt of, and worked for.

Apart from being a development approach at the village level, CIPS is also truly an information system. It is a tool villagers can use for gathering information through participatory research which they subsequently use for planning. Added information is needed when they implement projects as well. Through CIPS, the villagers can collect or discover information as well as create new facts for themselves as they convert their plans to reality.
"New Information Technology Applications for Decentralized Development in Asian and Pacific Countries," by Nitin Patel and Khalid Shams

The Asian and Pacific Development Centre (APDC) undertook a study in 1985-86 of thirteen applications of computers and IS in seven countries (China, India, Malaysia, Philippines, Singapore, Sri Lanka, and Thailand), focusing on the results of key policy interventions by governments for planned development of IT and on recent experience with IT applications which have had a high development impact. The case studies indicated clearly that microcomputer applications, particularly those developed by end-users themselves at local levels, can facilitate decentralized development. But computers themselves do not automatically guarantee decentralization; a major precondition is that the relevant governmental organizations must clearly specify the decision-making powers which will be decentralized and the level where such decisions can be taken.

The more recent cases reported from APDC's project network highlighted new IT applications, for example, in respect of rural credit programmes for the poor, integrated rural development projects, and village-based IS for decentralized planning both by governmental and nongovernmental organizations (NGOs). In all these cases, decentralization became possible because capacity for decision making was enhanced through computer-based IS operated at the local level. Increased availability of microcomputers and end-user computing have reinforced this trend. In most of the countries studied, computer applications consisted of statistical compilations and large volume transactions handling.

The main conclusions of the study are as follows:

(1) Decentralization with microcomputers has been facilitated in terms of (a) Project management at local levels; (b) sectoral programme management, district administration, and village data base management for planning and monitoring functions; and (c) national project monitoring systems.

(2) The new microcomputer applications at the district and project level are mostly concerned with setting up of new management IS or computerization of existing manual systems.

(3) A trend towards end-user computing is apparent, particularly in geographically dispersed locations.

(4) Even though decentralized applications tend to be end-user driven, there is a need for support services from a central organization to provide assistance in data standardization, integration among agencies, evaluation of hardware and software, and technical services, including training of end-users.

(5) There are rare instances of decision support systems which have been developed and put to use for purposes of planning or policy decision making.
DISCUSSIONS

IT was viewed as a key factor in supporting planning activities. Three factors were suggested as being essential to IS/IT implementation, as follows:

1. Project sponsorship or overall vision of the role of IT in supporting planning objectives. High-level sponsorship and vision (e.g., Singapore, where many of the politicians are also technocrats) ensures stable sources of long-term funding and human resources for IS/IT, while low level of support (e.g., Indonesia, where information is not given high priority in urban development) results in difficulties in obtaining funds and personnel for IS/IT.

2. Technical and organizational infrastructure. A holistic approach to technical architecture, integrating data, computing, and applications portfolio (e.g., Singapore), appears to be important in IS/IT implementation. In terms of organizational infrastructure, the role of the central organization changes from that of control function to one of coordination, focusing on human resource management and maintenance of the technical architecture.

3. Users' involvement in IS/IT. Efforts to increase users' acceptance of IT (e.g., Singapore and Indonesia), which are associated with commitment to training, take two forms: Relating IT to the prevailing value system, and providing the right tools for using IT in decision making. In relation to training, the development of IT professionals (e.g., Singapore) is a positive characteristic, which suggests operational continuity and a work climate capable of attracting and holding good people.

Involving end-users in technological change (sociological aspect) and using IT to attain the desired development or political goals (ideological aspect) are also desirable or necessary preconditions for success.

The country case studies focused separately on the roles that are being played by the central government and the community in IS/IT implementation. The central government is an important component of IS/IT implementation in Singapore's Civil Service Computerization Program, Thailand's Information System for Rural Development, Malaysia's SETIA Project, and India's NICNET/DISPLAN Project, while the Philippine projects involve the participation of the community in IS/IT development. Except in Singapore, IS/IT are undertaken in conjunction with monitoring and evaluation activities. The data issues relating to such activities encompass the following questions: Who decides what data to collect? How should data be updated? What data should be entered into the data base? How should data be processed and used? How should data validity and integrity be ensured? The social implications of data collection also need to be addressed: Would data collected at the village level retain its meaning when it reaches the state level? Do data collection and processing activities give appropriate consideration to the value system? Would the envisioned end result of data collection, processing, and analysis be of benefit to the people?

The country case studies illustrated variations or combinations of the top-down/bottom-up approach, centralized/decentralized planning, and cen-
entralized/distributed information support systems. In all of these cases, the need for standardization and integration of IS/IT, project monitoring and evaluation, and training was emphasized. The study by the APDC concluded that IS/IT can facilitate decentralized development; however, there is a need for stronger links between the decentralized IS/IT applications. The Philippine and Thai cases recognized the importance of participatory data collection and analysis -- e.g., in Thailand, government efforts were directed at establishing mechanisms for data collection at the village level, while in the Philippines, the Community Information and Planning System (CIPS) concentrated attention on establishing a mechanism for data validation. Although CIPS is a private initiative, it is a potential source of data for government planning.

THEME III: STRATEGIES TO GUIDE THE USE OF INFORMATION SYSTEMS/TECHNOLOGY IN LOCAL/REGIONAL PLANNING


Planning, by definition, is a complex task. More significantly, perhaps, to IS/IT concerns, is that much of planning cannot be described as routine. In particular, "activities such as prediction/forecasting, design, and decision, all involve qualitative as well as quantitative synthesis which cannot be integrated well within any IS structure." In this sense, the author argues that "planning must be 'informed' by IS technology, but that scientific use of such technology can rarely be built into the functionality of such systems." The thesis is thus advanced that "IS should be small-scale, manageable, and that there should be many different varieties of IS informing the planning task." Furthermore, "their use in any organization will be predominantly guided by noncomputerized functions and tasks."

In practical terms, this provides an important guideline for how to go about incorporating IS/IT in planning at various levels. Technology selected must be guided by the applications to which it will be put and the underlying principle must be one of facilitating the process of decision making regarding the various types of public and private sector interventions that constitute development programming. In essence, although the paper does not make the statement directly, it implicitly argues for an "appropriate technology" solution, emphasizing the specific base data and methodologies that are sufficient to meet specific planning problems or issues, rather than "high-level" systems designed to manipulate the overall complexity into a fully "integrated" plan.

Organizationally, this means that ultimate control of how the technology is used should remain firmly within the hands of planning professionals. The role of IT staff is thus, in a sense, subsidiary, although no less important, in that they provide a critical service role in the design and maintenance of system functions.

At the risk of some over-simplification, IS in planning can thus be viewed as a series of tools that inform the planning process and, at least in technical terms, lead to improved bases for decision making. IT can be
viewed in terms of the specific configurations of hardware, software, and "orgware" which organizes the hardware, software, and human elements of IS in ways that improve overall productivity. The implications of this view are significant since they emphasize the role of the planner, as opposed to the technology, and, at various levels of planning, emphasize IS/IT applications in terms of solving current real-life problems, rather than in terms of a more holistic view of spatial design over a much more indefinite future.

DISCUSSIONS

Two issues were raised during the discussions. The first issue concerns the socioeconomic environment in which IS can be successfully introduced and operated. It is difficult to identify the key elements which can bring about the successful introduction of computerized IS, although the sociocultural background and values of the society have great influence. Different cultures appear to respond differently to computerization and IT. Thus, different IS/IT may be developed, evolved, or applied in different communities or organizations.

The second issue is objectivity in data collection and analysis or research work. Some methods have been recently developed to ensure or enhance data objectivity (e.g., the Finnish household survey model). Although the lack of objectivity can be "reduced" or "lessened," it cannot be totally "wiped out" because individuals as "social beings" will never be free from sociocultural values and norms.

The participants were aware that there is variation between developed and developing countries in terms of their approaches to regional development. For instance, in the United Kingdom, from where cases were drawn in Batty's paper, emphasis has been often placed on the physical aspect of regional development. In the case of the Asian developing countries, the socioeconomic/cultural dimension is usually focused. Another difference is that while in developing countries, disparity among various regions is evident, in developed countries, disparity among classes is more evident and crucial than regional differences. A suggestion was made that UNCRD may explore ways and means to utilize and apply IS methods and models evolved in developed countries for use in developing countries.

THEME IV: INFORMATION SYSTEMS APPLICATIONS IN PLANNING

"Information Systems Applications in Regional Planning," by Jerry C. Coiner

Three major classes of IS/IT are being introduced into planning agencies in developing countries at the same time -- microcomputers, minicomputers, and mainframes. Review of each of those technologies and their applications illustrates that microcomputers most directly impact individual planners, while minicomputers serve projects and agencies, and mainframes encompass large institutions.

Experience with IS in developing countries has been based mainly on microcomputer applications, with heavy emphasis on commercial word
processing, spreadsheets, and database management applications. As more advanced microcomputers become available in developing countries, new applications in project management, desktop publishing, and computer-aided design and drafting will be of great utility to planning agencies. The availability of specially-designed applications to meet the needs of development planning is still extremely limited.

Minicomputers offer a wide variety of potentially powerful, project-level planning tools, including geographic IS and remote sensing data analysis. Minicomputers introduce into planning agencies the need for professional IS staffing and for a planned approach to using computers.

Mainframes are usually shared information resources that require extensive external support. They are useful in large-scale modeling and simulation and in the development of interagency IS. Because of the need for complex technical skills often not available in developing countries, mainframe approaches to IS are more prone to fail than either microcomputer or minicomputer applications.

The key to successful transfer of IS/IT is how the application is implemented in the new environment. Five guidelines are proposed to assist in successful implementation:

(1) Plan the system for incremental introduction.
(2) Design towards the least-complex configuration with local support.
(3) Use longer lead times for installation of the system.
(4) Approach cautiously the direct transfer of applications.
(5) Train end-users and other staff how to use the system and make clear its purpose.

IS will not alone solve development planning problems, but, if properly implemented and used, the systems can provide better information on which to base plans and development decisions.

"Application of Information Technology in Small and Medium Enterprises in Singapore," by K. S. Raman

This paper reviews the Small Enterprise Computerization Programme (SECP) introduced by the Government of Singapore within the broad package for national IS/IT development. The purpose of SECP is for the introduction, promotion, and servicing of IS/IT in this sector.

The paper views the current state of environment for IS/IT application in Singapore as positive. The objectives of SECP and the incentive package available are modest and meet with the requirements. The overall administrative, control, and feedback mechanism employed by the SECP has withstood initial problems and adequately meets SECP needs.

The incentive package consists of: (a) Education and awareness seminars; (b) technical "hand-holding" and advice; (c) technical expertise and
support; and (d) finance.

SECP covers the areas of servicing small and medium enterprises (SMEs), consultancy, feasibility study, and review of alternatives, implementation, and post implementation.

As of December 1987, there were 114 SMEs at various stages of IS/IT operation. There is a satisfactory detailed feedback established with the enterprises from the key players on financial subsidy, technical assistance, administration, and consulting companies.

Among the lessons learned are: (a) Several SMEs have no real commitment; (b) there is a misconception about financial incentives; (c) there is a long gestation period; and (d) cost-benefit analysis of computer systems was found to be different for SMEs. Intangible benefits become the key factor.

The most critical issue facing SECP is finding and assigning suitable advisers to SMEs. As a remedy, the fee for advisers has been increased.

The programme is expected to continue into the 1990s at the current level of activity.

DISCUSSIONS

The concern of both Coiner's and Raman's papers is the intelligent application of IS/IT. The discussion highlighted the dilemmas that developing countries face as they consider how to apply IS/IT to their planning activities. The participants referred to the importance of viewing IS/IT application as a learning process. They observed that many planners have little or no knowledge of what IS/IT can do. They felt that most planners are insufficiently trained to use IS/IT. They believed that planners can learn about the importance or usefulness of IS/IT through a process of experimentation (e.g., Singapore's SECP). This experimental process was seen as leading to efforts that place a high priority on training planners to enable them to understand and use IS/IT. The participants stressed that it is important not to leave IS/IT to professionals, but to make planners understand the system.

The issue of technology transfer was raised as well. The participants noted the importance of selecting and adopting IT that is appropriate to the needs and capabilities of planners and to the conditions of developing countries. They pointed out that inappropriate IT was sometimes transferred because donor agencies usually restrict planning agencies to obtain hardware made by firms in their countries, or because planners lack technical capability to assess the choice of IT or the feasibility of technology transfer. The participants indicated that effective adaptation and use of IT depended on training for planners. Counterpart training to support technology transfer is important. Attention should be given to identifying and training IT professionals from within planning agencies to guarantee their substantive input and commitment.

While arguing for simple and low-cost IT, the participants noted that it is important to respond to the desires of beneficiaries for IT. The participants found that in Singapore, "when the government wants it [IT],
the people seem to make it happen."

VOLUNTARY PRESENTATION

"Using IT in Planning," by Claud Burril

Burril outlined a framework for using IT in planning. The questions he posed were: Where to put IT, and how to use IT in planning. His concept of planning involves an input-process-output relationship. The process components are hardware, software, communication, procedures, standards, people, management system, and environment. The issue is how to put all these components in place. Burril’s approach is to start with the very basics (data accuracy) and to address such questions as system development methodology and data quality: How to make the process work correctly, and how to have a proper system to get a correct output.

In response to Burril’s presentation, it was pointed out that planning extends beyond the formulation stage to include implementation and evaluation. Although there is greater need for IT during the implementation and evaluation stages, IT will be needed at all stages of the planning cycle.

RESEARCH AND TRAINING PRIORITIES

(1) Use of Small IS/IT in Planning

There is an increasing use of small IS/IT, particularly spreadsheets, in planning. In research, emphasis may be placed on the identification of a mode for testing spreadsheets and the preparation of a tool kit on such analytical tools for use in planning. In training, emphasis may be placed on the feasibility of computer-aided instruction (on common planning models) and/or expert systems. Considerations such as who will undertake training, who will use such training materials, and who will pay for them are several of the topics discussed.

(2) Development of Planning Databases and Data Analysis Capability

Planning offices in developing countries (e.g., Malaysia) have needs for adequate data bases and data analysis capability in performing their planning functions. Development of an extensive planning data base and analytical capability will allow for greater use of IT for quantitative analysis (e.g., economic modeling).

In developing a data base, the information needs of both senior and junior planners should be considered: In general, senior planners want to use descriptive (qualitative) analysis, while junior planners want to use quantitative analysis.

Because planning software is available, training should address the need for achieving a capability for system modification. Opportunities for training involving experts from international agencies, industry, and universities should be explored.
(3) Other Suggested Topics:
- Software packages for small development projects
- IS/IT on women and minority groups -- involvement in training programmes on IS/IT, and improvement of information on such groups
- Data standardization -- cooperation between vendors and experts; innovations on hardware and software development
- Assessment of training needs of planners in IS/IT
- Information exchange capability -- clearinghouse on IS/IT

THEME V: CRITICAL SUCCESS FACTORS IN THE DEVELOPMENT AND IMPLEMENTATION OF INFORMATION SYSTEMS/TECHNOLOGY IN LOCAL/REGIONAL PLANNING

"Critical Success Factors in Developing and Using Optimization-Based Decision Support Systems in Local/Regional Development Planning in Developing Countries," by Joyce J. Elam

Decision support systems (DSS) take the traditional kinds of systems involving data processing and analysis for management one step further to embrace problem-solving and decision. In essence, a DSS involves solving a decision or design problem through a dialogue between the builder of such a system and the professional experts or managers who are required to produce a design or decision. Much of the process involves defining an appropriate model for the decision task which is based on continuing dialogue which will hopefully cover the "correct" model of the task. Decision support may only be able to produce a descriptive model of the problem, although it is most effective when the problem is perceived normatively and hence can be solved by optimization. In the context of an allocation problem, DSS can be regarded as a structure to elicit the constraints and objectives which influence the move towards finding the "best" or the "best" set of optimal solutions.

The type of problem to be solved and its context is all-important in effective DSS. If the problem is too ill-defined and/or too subject to the political vagaries of the decision makers, DSS is not likely to be appropriate. It works best when problems are not well-defined but sufficiently definable by DSS experts and managers together to enable best decisions to be conclusively identified. Elam indicates three examples which involve the budgeting and marketing of chemical production, the resources available to schools with different levels of efficiency and merit, and hospital functions involving many agencies and service types. The selection of an appropriate problem focus, its implementation through a DSS, and use of the most relevant DSS available constitute the criteria which enable successful decision support to be developed.
DISCUSSIONS

Discussions on Elam's paper focused on the following points:

- The method of introducing DSS seems to be appropriate.

- There should be a distinction between data management and decision making management.

- DSS should be applicable to larger national problems.

- The political element in decision making may render DSS irrelevant.

- DSS should be viewed more as an exploratory model rather than as a bottom-line solution.

- The problem of user interfacing of new IT was also raised. Improvement in user interface should be looked into, particularly in the use of more graphic and verbal instructions.

- Throughout the discussion, the problem of cultural differences was commonly cited. What the participants stressed was that DSS must take into account the local context.

- DSS should be seen as a tool to enhance decision making, without ignoring the political element. When using DSS, a conceptual model approach should be used by the decision maker. For DSS to work effectively, the problem must be sufficiently well defined. A problem lacking in data cannot be tackled by DSS.
DISCUSSION GROUP REPORTS:
ACCELERATING IMPLEMENTATION OF INFORMATION SYSTEMS IN
LOCAL/REGIONAL PLANNING:
IDENTIFICATION AND ANALYSIS OF KEY ISSUES
DISCUSSION GROUP REPORTS:
ACCELERATING IMPLEMENTATION OF INFORMATION SYSTEMS IN LOCAL/REGIONAL PLANNING:
IDENTIFICATION AND ANALYSIS OF KEY ISSUES

Discussion Group 1: Economic, Financial, and Related Issues

The group agreed that IS/IT should not only be looked at in terms of their economic and financial implications. This insight was triggered by a quotation from a Chinese proverb stating that: "If one plans for a year, one must plant grain. If one plans for ten years, one must plant a tree. If one plans for a lifetime, one must plant men."

A good investment in human resource development is precisely an investment in IS/IT because information is very much needed in the "planting of men." Thus, IT must be looked at in human terms, which means that sometimes it cannot be fully computed in economic terms alone.

Because there were some donor agencies represented in the group, the discussion revolved around the influence these donors exert in the choice of IT. Although often the donors provide financial support for IT, their contribution must be seen in a broader sense.

The group also stressed that there is a need for a national framework to which other piecemeal projects and strategies should be linked. It is possible to introduce a comprehensive IS/IT system as demonstrated in the case of Singapore. However, for this to succeed, there is a need for interministerial coordination.

The situation is such that, in many countries computers are not fully used and data available are not all used. It is important that this situation is assessed before new programmes are implemented. For example, one should look at the resources at the subnational level before setting up other systems.

The value-added concept was also discussed. At issue is the relevance of the concept to developing countries. Instead of the value-added concept, IS/IT should be examined more on their cost-saving potential.

Discussion Group 2: Project Design and Technical/Technological Issues

Information systems are only a tool in planning; hence, the usefulness of a particular IS depends on the context in which it is used as a tool.

A major determinant of "the context" is the political and sociocultural climate for planning, as well as the degree of decentralization, as demonstrated by the different country experiences. Another important determinant is the administrative level at which the information system is used.

In general, within planning, information systems are instrumental in the management of data banks, in controlling the planned development process, and in empowering the underprivileged.
Issues regarding IS/IT and project design are linked to one another, and, as the matrix depicted below shows, are limited to the administrative level at which the information system is applied.

<table>
<thead>
<tr>
<th></th>
<th>Application</th>
<th>Feasible Technology</th>
<th>Available Data</th>
<th>Need for Quality Control</th>
<th>Accessibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>National</td>
<td>Development process control</td>
<td>Micro/macro, special programmes</td>
<td>Quantitative, codified</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Regional</td>
<td>Administration</td>
<td>Microcomputers, standard programmes</td>
<td>Filtered, Processed</td>
<td>Successive validation</td>
<td>AT all levels</td>
</tr>
<tr>
<td>District</td>
<td>Empowerment</td>
<td>Manual</td>
<td>Qualitative, experience</td>
<td>Easy, check with experience</td>
<td></td>
</tr>
<tr>
<td>Village</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

The issues in the matrix are explained in more detail below.

(1) Application

In general, there are three types of applications of information systems in planning:

(a) Control of the planned development process. This application is important at the national level and, to a lesser extent, at the regional level also — because the sheer size of projects to be appraised, reviewed, or monitored — increases at each successive level of development administration. It should be noted in this respect that an automated information system is useless without the right administrative and operational procedures to render the information needed to enable such control.

(b) Administration of data banks. This type of application is relevant at every level, though the contents of the data banks at every level should be tailored to the information needs for planning at that particular level. This does not mean that the data banks at the different levels should be developed in a separate fashion; if possible, they have to be linked. This necessitates a certain degree of standardization and adequate two-way communication between levels.

(c) Empowerment of the underprivileged. Having the means to analyse their own situation can give underprivileged people the motivation to improve their situation and the voice to persuade higher-level decision makers to pay attention to their problems. To a
less extent, the same applies to lower administrative units within a hierarchical planning system.

(2) Information Technology

The information technology chosen should not only fit the requirements of the outputs that are expected of the information system, but should also take into account to what degree the "environment" is conducive for automated IT. Parameters in this regard are the availability of: (a) Trained computer operators or training facilities; (b) software advisory services and hardware maintenance facilities; (c) physical infrastructure, such as stable power supply and climatological conditions; and (d) financial resources to operate and maintain the automated computer system.

Though an IS/IT project might try to solve these bottlenecks directly, in general, conditions at the national level will allow sophisticated IT to be used, like mainframe computers and special programmes.

At middle administrative levels, microcomputers and standard or simplified programmes are an attractive option, whereas at the village level, manual processing is the feasible information technology.

(3) Available Data

The information available at the village level is of a qualitative nature and much of it concerns "experience." As one moves up the administrative hierarchy, the data is filtered and processed and becomes available at the national level as quantitative figures.

(4) Need for Built-in Control

The more remote a person is from the source of data or from the particular area covered by statistics, the greater becomes the need for building-in quality controls within the IS. Validation of data at village and district levels, assuming that data are made available, is comparatively easy because one is able to compare the information rendered by the IS with one's own impressions and experience.

At higher administrative levels, quality control has to be formalized into the IS. Fortunately, computerized IS, which are, as mentioned, feasible at this level, offer the possibility for consistency checks.

(5) Accessibility

An important requirement for IS in planning at every level is that they should be accessible to every potential user. In many countries, however, practical or principal obstacles hamper access to the information stored. This should all the more be resented, because restricted access frustrates quality control of the information available in the IS.

A final issue concerns the fact that at present, in many countries, the supply of data grossly exceeds the demand and that the
same type of data is collected by several agencies. Therefore, in order to save money on data collection and to avoid endless discussions due to irreconcilable information, the installation of information audits will be useful.

Discussion Group 3: Policy and Institutional, Political and Sociocultural, and Organization and Management Issues

Policy and Institutional Issues

It was seen that at present, except perhaps for Singapore, there is a lack of formal information policy on the part of most governments. A formalized IS/IT policy will considerably reduce corruption by making information transparent. Coupled with the lack of policy is the fact that IS/IT have a very low priority with governments.

There are very few articulated legal policies regarding access to data and when data can be made available to whom. In Malaysia, for example, data are available on a "need to know" basis. While governments should promote data access, there is a need for a clause that will classify data for general knowledge and those that should be safeguarded for reasons of security.

Political and Sociocultural Issues

There are political and cultural obstacles to the collection of data. Information is sometimes withheld for political reasons and the respondents may be hesitant to answer questions for cultural reasons. In Sri Lanka, for instance, there are certain types of information that cannot be divulged because they are politically sensitive. Situations like these cast doubt on the quality and integrity of the data.

There appears to be a lack of political will on the part of some governments as well as bureaucrats, to push for IS/IT. Moreover, there seems to be a sociocultural gap in computer orientation between the leaders, the bureaucrats, and the technocrats in most countries. In Singapore, IS/IT are quite successful partly because of the commitment of the government to IS/IT. This is due to the fact that, in Singapore, the bureaucrats and technocrats are both very supportive of IS/IT. This is also true in India where the Prime Minister is supportive of IT.

Organization and Management Issues

There is a need to have a balance between centralization and decentralization. There may be a need for standardization for centralization to become feasible, but at the same time this will pose some problems. Planning, for example, at the lower level, needs local-specific information which is lost in the process of standardization.

There are problems concerning statistics compiled by different agencies. For the same variable, statistics may differ from agency to agency. For this purpose, an intraorganizational sharing of data may be needed.
There are common information systems but these systems are not known by the people who will benefit from knowing the existence of an IS/IT.

There are differing information priorities of different countries. As such, there is a need to improve coordination between the government, the private sector, and academia, so that information priorities can be clearly defined and effectively addressed by better IS/IT programmes in the country.
IMPLEMENTING INFORMATION SYSTEMS/TECHNOLOGY IN
LOCAL/REGIONAL PLANNING:
A REVIEW OF CRITICAL SUCCESS FACTORS
IMPLEMENTING INFORMATION SYSTEMS/TECHNOLOGY IN LOCAL/REGIONAL PLANNING:
A REVIEW OF CRITICAL SUCCESS FACTORS

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The main message of the Expert Group Meeting on Integrating Information Systems/Technology (IS/IT) in Local/Regional Development Planning, held from 31 October to 4 November 1988 in Singapore, was that the central focus of IS/IT should be on their implementation. After a decision is made to establish an IS/IT project, what is done by those who implement the project will determine its success or failure.

The message of the meeting was highlighted by the experience of developing countries with IS/IT. In a resource-scarce environment, the problem of implementing IS/IT projects becomes even larger for planning agencies. Any new IS/IT projects may have to come, not from new funds or increased budgets, but from strengthening the management capability of existing projects. The meeting brought out the need for giving increased attention to improved IS/IT management and technical capability — since it is here that progress has been relatively slow.

Recent limited successes in the light of the country experiences presented at the meeting suggest more effective ways of mobilizing expertise for implementing IS/IT projects. New forms of information management and information jobs will be needed — i.e., chief information officers, data development managers, and systems development managers which are in short supply, e.g., in the case of Indonesia’s National Urban Development Strategy (NUDS) Project. A coherent strategy must deal with training, research, institution-building, information networking, innovative, collaborative, and selective technical and managerial approaches, the use of a tested and proven methodology, and other supporting factors.

An analysis of the IS/IT projects that were discussed at the meeting revealed that no single criterion exists to predict an IS/IT project’s success; however, there are some factors that appear to be more effective than others. This summary is designed to identify the factors that are most critical to IS/IT project success and the indicators that tend to correlate with that success. The following IS/IT projects were reviewed: IS/IT for regional planning in Malaysia, Philippines, and Sri Lanka; Singapore’s Civil Service Computerization Programme (CSCP); Singapore’s Small Enterprise Computerization Programme (SECP); Indonesia’s NUDS Project Urban Planning Data Base and Information System; Thailand’s Information System for Rural Development Project; Malaysia’s SETIA (acronym for System Economic Planning Unit, Treasury, Implementation Coordination Unit, and Accountant General’s Department) Project; India’s District Planning (DISPLAN) on National Informatics Centre Network (NICNET) Project; the International Institute of Rural Reconstruction’s participatory development planning model; the Community Information and Planning System (CIPS) in the Philippines; and the Asian and Pacific Development Centre’s study on IT Applications for Decentralized Development.
The factors are discussed below under three categories: (a) Human factors (including leadership, community participation, and communication; and training and technical assistance); (b) organizational factors (including policy support for IS/IT; organizational structure; and commitment of financial resources); and (c) technical/technological factors.

**HUMAN FACTORS**

**Leadership, Community Participation, and Communication**

A review of the IS/IT projects revealed that leadership provides the missing ingredient that may help to reduce some critical implementation handicaps. A primary function of leadership is to set clear goals and objectives, to win acceptance among IS/IT users for such goals and objectives, and to provide commitment to achieve project goals and tasks. For instance, in Singapore, the CSCP, established in 1981, had multiple objectives: To spearhead the national computerization effort; to increase productivity and effectiveness of government operations; to improve the level and range of government services; and to create interest and promote computer usage in the civil service. The SECP, established in 1986, had a single goal: To develop a favourable external environment for small and medium enterprises to become more competitive through the application of IT. In Malaysia, the SETIA Project, established in 1986, had the following objectives: To integrate the IS of four central agencies; to develop an IS to support planning and implementation of development projects in twenty-four ministries and thirteen state development offices; and to process data for the Fifth Malaysia Plan, 1986-1990. In India, the DISPLAN on NICNET Project, established recently, had a long-run focus: To decentralize the planning process at the district level; to establish a data base for planning at the district and block levels; to monitor and evaluate development activities in the district; and to support the decentralized planning strategy for the Eighth Five-Year Plan, 1990-1995. In Thailand, the Information System for Rural Development Project, established in 1982, aimed to provide accurate, timely, and useful information for the formulation of policy for the rural development programme and for the planning, monitoring, and evaluation of the programme.

Another function of leadership is to coordinate a multiplicity of IS/IT projects. For instance, the National Computer Board (NCB) of Singapore performed CSCP-wide planning and coordination, and worked closely with the ministries involved in the CSCP. The Implementation Coordination Unit (under Malaysia's Economic Planning Unit (EPU)), which supervised the SETIA Project, had been coordinating planning and implementation of development projects for thirty years. The National Rural Development Committee in Thailand had the Prime Minister as chairman and the Secretary-General of the National Economic and Social Development Board (NESDB) as secretary. In India, the Prime Minister took a personal interest in the DISPLAN on NICNET Project.

In some projects, however, it would seem that leadership played a less important coordinative role. The problem of the uncoordinated, piecemeal development of some IS/IT projects seems to indicate the need for focusing attention to this neglected factor. Examples are: In Malaysia, the collection of statistical data by various government departments, statutory bodies, and agencies; in the Philippines, the National Economic and Devel-
opment Authority (NEDA)-United Nations Development Programme (UNDP)-Inter-
national Bank for Reconstruction and Development (IBRD)-supported Inte-
grated Regional Information Systems (IRIS) Project (1982-86), the Regional 
Statistical System Development Project (RSSDP), the Land Use Information 
Systems (LUIS) Project, the Regional Development Information System 
(REGDIS), and the Regional Project Monitoring System (RPMS), all under the 
auspicies of the NEDA Regional Development Staff; and in Sri Lanka, the 
Integrated Rural Development Programme (IRDP) Monitoring and Information 
System (Ministry of Plan Implementation-Netherlands Management Development 
Foundation Project), the Kalutara District Geo-Based Data Systems Project 
(Ministry of Home Affairs-United Nations Educational, Scientific and 
Cultural Organization (UNESCO)-Economic and Social Commission for Asia and 
the Pacific (ESCAP) project), the Land-Use Information Systems Project 
(Land-Use Policy Planning Division, Ministry of Lands and Land Develop-
ment), the Information System for Local-Level Planning in Hambantota Dis-
trict (Norwegian Agency for International Development (NORAD)-Asian Insti-
tute of Technology (AIT) study), and the Information System for Monitoring 
Development Indicators at District Level (Nuwara Eliya district) (Ministry 
of Plan Implementation-ILO/ARTEP study).

The absence of coordination between IS/IT projects was further noted 
in countries where data collection and information provision were the tasks 
of different ministries and agencies (e.g., in Malaysia).

Community participation is also an essential ingredient of successful 
IS/IT projects. If IS/IT projects include community participation in their 
designs, participation will foster systems capable of effective response to 
people's needs. Both the CIPS Project and the IIRR participatory approach 
provided a consultation/feedback mechanism to obtain villagers' views and 
opinions on village projects. The CIPS Project developed a model which 
facilitated the efforts of village residents in the collection and analysis 
of information and the production and monitoring and evaluation of village 
projects. The IIRR approach was an attempt to develop a strategy which 
could facilitate project identification, planning, implementation, and 
evaluation. Both projects represented efforts at increasing people's 
awareness and involvement in the formulation and implementation of commu-
nity projects. Both projects also focused on an issue: A local/regional 
plan should include an IS/IT component that is attuned to community needs 
and that gives village residents the opportunity to participate in data 
collection and analysis and in the formulation and implementation of vil-
lage projects. A participation/feedback mechanism helps create a two-way 
communication process in the villages. Nonetheless, the benefits of commu-
nity-oriented IS/IT projects should be augmented through a strategy to in-
tegrate community information inputs with local/regional planning efforts. 
Studies are therefore needed to establish links between private and public 
IS/IT initiatives.

The case studies also suggest that communication is vital to effective 
planning and implementation. A problem that has been observed in a number 
of projects is the absence of good means of communicating information. By 
 Improving the communication of information, IS/IT can be an effective tool 
to help planning and implementation to be more successful. Thus, a mecha-
nism for continuous and structured flow of information (e.g., a decen-
tralized information and communication network) should be developed.
Training and Technical Assistance

Training provides an essential source for enhancing IS/IT skills, and influences the success of IS/IT projects. Training enhances IS/IT management and technical capability building. In projects that include a training component, the chances for the effectiveness of IS/IT and the acceptance of the systems by end-users improve.

Short-term user education was the training strategy followed by some IS/IT projects. The DISPLAN on NICNET Project in India placed emphasis on the training of user personnel at all governmental levels. The SETIA Project in Malaysia required two weeks’ training for all the officials of twenty-four ministries and thirteen state development offices prior to the installation of personal computers in those offices. In Singapore, training of IS/IT professionals for the CSCP was managed centrally by the NCB. The NCB provided user education programs for all levels of users from cabinet ministers to clerical workers. On the other hand, the SECP utilized IT awareness and education seminars for managers of small industries; the seminars were provided by the Institute of Systems Science, National University of Singapore. In Thailand, training of end-users at all governmental levels was provided as part of loans from the U.S. Agency for International Development (USAID). The computer vendors carried out training for information users and operating personnel; in addition, the Information Processing Institute for Education and Development (IPIED), Thammasat University, organized training for the administrators, information users, and operating personnel involved in the Information System for Rural Development Project.

The country experiences have shown that training in IS/IT should be supported with technical assistance. Without such support, IS/IT projects will likely fail to improve their management capability and increase their technical competence.

Six of the IS/IT projects reviewed contained elements of technical assistance. By giving attention to counterpart training, these projects’ approach has proved sustainable. In Singapore, NCB’s strategy was to deploy IS/IT professionals to the ministries covered by the CSCP. The IS/IT professionals provided technical leadership and expertise, formulated IS/IT strategies, selected the appropriate computer technologies, and trained the users to utilize the systems. In the case of the SECP, technical and advisory services were provided by the SECP advisors. In India, management information systems and computerization services in several ministries, departments, and state government organizations were supported by 1,500 computer specialists from the National Informatics Centre. Sri Lanka’s IRDP Monitoring and Information System received technical support from the Management Development Foundation, Netherlands. The CIPS Project and the IIRR participatory model also included provisions for community training. The CIPS Project trained and utilized field-workers to promote activities in the community and to communicate village committee decisions to the villagers and feedback information to the committee. The key to the IIRR approach was the training of rural reconstruction facilitators to help implement a ten-step strategy for project identification, planning, implementation, and evaluation.

Although training and technical assistance activities were successfully incorporated into the above-mentioned IS/IT projects’ designs, some
questions remain: Are user education programmes capable of providing effective instruction in basic IS/IT skills? For a training programme to successfully target the broad range of users, what are the alternatives to user education?

The view was expressed that evaluation should be undertaken to gather more empirical data on the effectiveness of user education programmes in developing countries. Research is also required to assess the training needs of the target population, which could serve as general guidelines for formulating a formal long-term IS/IT training strategy.

ORGANIZATIONAL FACTORS

Implementing IS/IT design requires looking beyond the human factors. Adequate attention should also be given to the policy aspect, organizational structure, and financial resources of IS/IT projects.

Policy Support for IS/IT

A fundamental issue facing IS/IT implementation in developing countries is the need for an appropriate policy on IS/IT. In some of the countries reviewed, government policies had been supportive of IS/IT. For example, in Thailand, the Information System for Rural Development Project had the full support of the government. The importance of IS/IT was initially established in the Fifth National Economic and Social Development Plan, 1982-1986. The Sixth National Economic and Social Development Plan, 1987-1991 offered a prime opportunity for expanding the project to seventy-two provinces and thirty departments. In Singapore, the receptivity of the government to the Committee on National Computerization’s study made it possible to create the NCB and launch the CSCP in 1981. The NCB and the ministries shared a common interest in IS/IT. The creation of an IS Steering Committee in each ministry, chaired by each ministry’s Permanent Secretary, reflects the ministries’ commitment to the CSCP and provides a formal mechanism for monitoring and coordinating governmental computerization efforts. In Malaysia, the SETIA Project resulted from a 1981 Cabinet Committee Study on Steps to Speed Up the Implementation of Development Projects. The Fifth Malaysia Plan, 1986-1990 endorsed the use of computers and other electronics technology in the planning and implementation process. These country cases confirmed the important role that policies have in IS/IT implementation.

However, in other countries (e.g., Indonesia and Philippines), the lack of clearly stated policies created obstacles to successful IS/IT implementation. For instance, in Indonesia, the limited process of institutionalizing the NUDS Project and its Urban Planning Data Base and Information System was not accelerated. It was noted that the government was reluctant to adopt the strategy as an overall process, and instead chose to adopt specific elements of the strategy which were considered useful or relevant to particular planning and programming applications. The Philippine IRIS Project also showed how the absence of a strong policy on IS/IT made it difficult to achieve the institutionalization of the project. In both the Indonesian and Philippine cases, the end of donor support (e.g., UNDP/United Nations Centre for Human Settlements (UNCHS) (Habitat) assistance in the NUDS Project, 1980-89, and NEDA-UNDP-IBRD regional planning
assistance project, 1975~83) created problems in continuing the projects. It was impossible to maintain the level of interest and effectiveness generated by the funding agencies because the governments were ill prepared financially and did not have the technical expertise to take over project efforts.

Organizational Structure

A review of the IS/IT projects showed that the development of organizational capability is the most essential task in an IS/IT strategy. Unless organizations for IS/IT implementation are developed, there is little chance for long-term sustainability.

The successful IS/IT projects in the case study countries were able to establish a positive organizational environment for IS/IT. Their experiences showed that projects can only be sustained if the organizations in which they are based are willing to provide active support for IS/IT. Examples include the DISPLAN on NICNET Project at the Indian National Informatics Centre, Department of Electronics; the Thai Information System for Rural Development Project at the National Rural Development Coordination Center (NRDCC), NESDB; the Singaporean CSCP at the NCB, Ministry of Finance; and the Malaysian SETIA Project at the Implementation Coordination Unit, EPU.

Some lessons about IS/IT project sustainability can be learned from such projects; these include: (a) IS/IT projects should build on existing organizational capabilities and personnel rather than start from scratch; (b) effective organization and management systems should be in place; and (c) projects should include provisions for decentralized or distributed IS/IT, and should not attempt to follow a top-down, centralized, nonparticipatory approach to IS/IT planning and implementation.

Commitment of Financial Resources

This review found that financial sustainability is a problem in some IS/IT projects originally supported by donor agencies (e.g., the IS/IT projects for regional and rural development in the Philippines and Sri Lanka). When donor support ended, the IS/IT projects also stopped, and the planning agencies were able to finance only limited efforts. The Philippine and Sri Lankan examples raise important questions about the donors' responsibility in pilot projects. Clearly, there is a need to explore ways in which the governments could assume financial responsibility for the projects and -- given the high cost of developing IS/IT projects -- project designs should include plans for a follow-on implementation phase if the projects prove successful. Plans for phased withdrawal of donor assistance are also essential.

This review also found that IS/IT projects can be sustained if the parent organizations are willing to fund or subsidize the projects. A review of three projects showed that their parent organizations systematically incorporated willingness-to-fund procedures into their IS/IT project designs. For example, Singapore's NCB reported that it appropriated a substantial budget for the CSCP, and provided about US$100 million for the programme during the last five years. Funding for the Malaysian SETIA
Project came from the federal government budget for ICU's National Operations Room Project. Approximately US$1.3 million was appropriated for hardware acquisition and maintenance as well as software for the SETIA Project. Thailand's Information System for Rural Development Project was funded from foreign loans and from government appropriations for the NRDCC. The USAID provided US$4 million loans in 1987 to strengthen the rural development programme, and the project received US$500,000 for the purchase of microcomputers for seventy-two provinces and thirty central government agencies. The project also received a grant of US$1.880 million from the Japan International Cooperation Agency (JICA) for the purchase of computers and other equipment. The Royal Thai Government provided a counterpart annual operating budget of US$180,000 to the NRDCC and US$280,000 to the IPIED, Thammasat University.

Such projects were financially viable, because the governments guaranteed payment of recurrent costs and provided a steady and dependable flow of financial resources for IS/IT.

TECHNICAL/TECHNOLOGICAL FACTORS

In the successful projects reviewed, IS/IT and supporting services and information inputs were appropriate to the needs of the projects. The projects identified their information needs and were able to translate meeting those needs into information output.

The analysis of the IS/IT projects showed that success is probable provided that the following conditions prevail:

(a) A tested and proven IT, expertise, and application know-how exist that are appropriate to users' needs;

(b) Supporting services (including sufficient, adequate, accurate, and regular data input, data analysis capability, data base, and methodologies) are available and dependable enough to support IS/IT;

(c) IT is integrated with planning operations, using standardized IS and technical architecture;

(d) Data structures promote interchange and sharing of data between applications and data bases for planning; and

(e) In the case of IS/IT projects supported by donor agencies, it would be desirable to provide hardware and software that are well supported locally.

The successful projects will continue to evolve and adapt to new applications. For these projects to maintain their relevance to users' needs, regular evaluations of their performance must be conducted. A major goal for these projects is to become "learning systems" -- systems that continually update their activities, refresh their training facilities, and renew their goals and objectives. The projects serve as learning devices which facilitate the replication of more realistic and adaptive IS/IT on a national scale.
IMPLICATIONS FOR ACTION

The implementation of IS/IT in local/regional planning presents different requirements; the key issues to be addressed are as follows: (a) the use of appropriate IS/IT to support community, local, and regional planning; (b) training of both IS/IT professionals and users; and (c) the role of policymakers, local and regional planners, and IS/IT professionals in IS/IT implementation.

Appropriate IS/IT for Planning

In developing countries, institutional capability is limited because of a lack of resources and trained manpower. The ability of the planning agencies to support IS/IT (such as hardware and software, training facilities, logistical support, and supplies) is very limited. The choice of IT and the method of using that technology therefore reflect the financial and institutional capability of the planning agencies.

Recognizing these constraints, the participants in the expert group meeting agreed that low-resource, low-cost, small-scale, decentralized IS/IT for generating useful, relevant, and timely data for planning, rather than elaborate, costly, and complex systems should be established. The IS/IT should be:

(a) A collaborative effort of IS professionals and community and local/regional planners;

(b) Appropriately structured and organized to engender strong community involvement in data collection, processing, and analysis and in the utilization of IS/IT, as well as to facilitate access to IS/IT; and

(c) Gradually phased and implemented according to a well-ordered plan.

The choice of communication/dissemination techniques to support IS/IT is also critical. A participatory approach can provide a sustainable communication/dissemination system; one that promotes a two-way flow of information, includes an outreach mechanism at the community level, and encourages and motivates the villagers to communicate their ideas and development needs.

These factors point to the need for appropriate donors' inputs to donor-supported IS/IT projects. The prospects for project sustainability can be increased if donors provide: (a) equipment and materials that are appropriate to local conditions and needs and can be maintained at reasonable cost; (b) adequate institutionalization of skills and counterpart training capabilities; and (c) systematic post-project financing.

Training in IS/IT

Inadequate attention to training can lead to the failure of IS/IT projects. The tasks involved in creating successful projects include reviewing training needs and resources, and preparing systematic training
plans. Training should be implemented as a part of the projects’ aims and designs.

To help local and regional planners to use IS/IT, their capabilities must be raised to the level necessary for understanding, using, and innovating with IT. Combined training and capability-building activities must be initiated by planning agencies with IS/IT research and training institutions in the countries. In addition to gaining hands-on experience in using IS/IT, trainees should be given practical training in managing IS/IT, in mobilizing policy, management, and user support, and in training and supervising IS/IT workers.

In developing training programmes in IS/IT, some criteria are needed to define the group (e.g., IS professionals and users) to be trained, the courses and curriculum appropriate for trainees, instructional media and materials, and training methodology.

The Role of Policymakers

The lack of desired success in some IS/IT projects can be traced to inadequate political acceptance and support. A point stressed throughout the meeting was that political support is critical to the effectiveness of IS/IT projects. Innovative ways are therefore sought in terms of ensuring support and commitment by policymakers.

Policymakers can provide a stimulus for IS/IT implementation by:

(a) Formulating appropriate policies on IS/IT;
(b) Sustained commitment, including stable, long-term funding; and
(c) Promoting IS/IT development and implementation through legislation.

The Role of Local and Regional Planners

Local and regional planners should analyse their information needs and develop a strategy for IS/IT development and implementation. The strategy should include:

(a) A framework for IS/IT development and implementation as an integral part of the planning process;
(b) A strategic plan for allocating resources for IS/IT over a period of time;
(c) A plan to identify the types of data that will be gathered and analysed for planning, the methodologies for gathering quantitative and qualitative data, and the procedures for rapid, low-cost data gathering and analysis; and
(d) A plan to identify the components of the information system (including staff for data collection and analysis, plan formulation and implementation, and monitoring and evaluation; training in
data collection, analysis, and dissemination techniques and methods; and actual data collection, analysis, and dissemination).

The Role of Information Systems Professionals

IS professionals should:

(a) Prepare reports and technical training manuals which can be understood and used by nontechnical personnel. Those materials should provide better communication between technical staff and nontechnical planners, administrators, and managers;

(b) Design and implement IS for planning with the concepts of data exchange and data sharing as major concerns. Planning IS must be able to use data from and provide information to all elements of government;

(c) Develop systems that adhere to national and international standards in data management, data communication, and security; and

(d) Assist in developing standards that reflect the need for common methods of data processing and exchange to support planning and other governmental functions.
CONCLUSIONS AND RECOMMENDATIONS OF THE EXPERT GROUP MEETING ON INTEGRATING INFORMATION SYSTEMS/TECHNOLOGY IN LOCAL/REGIONAL DEVELOPMENT PLANNING
CONCLUSIONS AND RECOMMENDATIONS OF THE EXPERT GROUP MEETING ON INTEGRATING INFORMATION SYSTEMS/TECHNOLOGY IN LOCAL AND REGIONAL DEVELOPMENT PLANNING

All participants represented at this meeting express a clear commitment to the use of information systems/technology (IS/IT) in local and regional planning. However, this commitment takes many different forms, from national-level systems to support macroeconomic planning to local-level community systems incorporating villager input into project identification and implementation. With the exception of, perhaps, Singapore, the degree of commitment of the managerial/technical elements within the governments exceeds the commitment of the political components. This creates problems of resource allocation and justification for most IS initiatives within the public sector.

Although all governments have embarked on IS/IT programmes, central coordination and control is minimal. In most countries, this has led to problems with current applications, however, as the use of IS/IT diffuses within the government serious technical compatibility, and data sharing problems may arise.

Within the proposed typology of transaction, information management, and decision support systems (DSS), most of the current systems in the governments fall into the first two classes. However, many decision support applications may have been undertaken without widespread dissemination of the use of DSS concepts for forecasting.

The degree to which IT impacts on planning effectiveness may be largely controlled by the nature and quality of data. Data management should focus on guaranteeing a valid representation of the social, economic, and environmental conditions which form the basis of planning. Top-down technocratic definition of the data needed to meet information requirements should be avoided. Data management processes which encourage representation of the social groups directly impacted by planning should be encouraged. Care must be taken that technocratic definition of data requirements do not systematically eliminate unique and site-specific development considerations which may have the most impact on the local population, or eliminate the needs of those elements of society, such as women, whose direct input to formal governmental planning may be limited.

The expert group meeting recommends the following action:

1. Appropriate technology and methodology should be developed in a participatory manner to aid local villagers in systematically identifying development needs within their community. The use of appropriate technology would allow the villagers to better communicate their ideas and needs to the government technocrats responsible for delivery of services.

2. Over the last five years, the United Nations Centre for Regional Development (UNCRD) has organized two international seminars and two expert group meetings on IS/IT. These seminars and meetings have resulted in a large number of papers, which should now be...
reviewed and analysed for major themes, such as implementation guidelines in the use of IS/IT in local and regional planning.

(3) Communications materials on the use of IS/IT in local and regional planning should be developed. Those materials should focus on explaining IS/IT to the planner and to the policy-making and political elements the planner supports.

(4) Discussion during the meeting has revealed a number of free or low-cost software packages which can be implemented and used in local and regional planning. UNCRD or its designated counterpart international organization (IO), intergovernmental organization (IGO), or nongovernmental organization (NGO) should act as a clearinghouse for freeware, review operational packages, and investigate a data base of professional resources in IS/IT for support of local and regional planning.

(5) While holding four meetings in IS/IT, UNCRD has reached many planning professionals who are interested in using IS/IT. The UNCRD or its designated counterpart IO/IGO/NGO should develop a network of these professionals to diffuse information about IS/IT between national governments.

(6) Recognizing the training requirements for purposes of integrating IS/IT in development planning, UNCRD, in collaboration with concerned UN agencies, should give priority attention to identify these training needs and take appropriate measures to implement them, taking into consideration existing resources and facilities in countries in the region.

(7) UNCRD should assist planning agencies in the identification of appropriate technology, as well as in implementation and training in the IS/IT field.
APPENDICES
APPENDIX 1: LIST OF PAPERS

Año, Daisy Elena F.
Use or Potential of Information Systems/Technology in Regional Planning in the Philippines

Batty, Michael
Informative Planning: The Intelligent Use of Information Systems in the Policy-Making Process

Coiner, Jerry C.
Information Systems Applications in Regional Planning

Elam, Joyce J.
Critical Success Factors in Developing and Using Optimization-Based Decision Support Systems in Local/Regional Development Planning in Developing Countries

Kitisak Sinthuvanich
Information System for Rural Development in Thailand

Lee Kwok Cheong
The Computerization of the Singapore Civil Service

Monu, Erasmus D.
Delivering Relevant Development Information to the Rural Poor

Morapaya, R. B.
Regional Planning Situation Report on Sri Lanka

Nik Ibrahim bin Nik Mahmood
Information Systems and Technology for Regional Planning in Malaysia

Patel, Nitin and Shams, Khalid
New IT Applications for Decentralized Development in Asian and Pacific Countries

Polestico, Rachel
Community Information and Planning System

Rahman bin Jamal, Abdul
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Raman, K. S.
Application of Information Technology in Small and Medium Enterprises in Singapore

Roslan Zaris, Dading Sugandhi, and Gardiner, Peter
Development of an Urban and Regional Planning Information System: A Case Study

Seshagiri, N.
The Role of Information Systems in Development Planning in India: A Case Study of DISPLAN on NICNET
Yunus Tamin, Mohd.
SETIA: An MIS Tool Promoting Development in Malaysia
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44. Hidehiko SAZANAMI Director, UNCRD
45. J. S. EDRALIN Information Systems Planner, and Coordinator, Research Project on Information Systems for Local/Regional Development, UNCRD
APPENDIX 3: PROGRAMME

Venues: Monday-Thursday, 31 October-3 November 1988: Royal Suite, 15th Floor, Hotel Royal
Friday, 4 November 1988 (Closing Session): Conference Room, AMIC

MONDAY, 31 OCTOBER 1988

08:30-08:50 Registration
08:55 Arrival of Guest of Honour
09:00 OPENING CEREMONY

Master of Ceremonies: Benjamin V. Lozare

Welcome Addresses

Hidehiko Sazanami, Director, UNCRD
Vijay Menon, Secretary-General, AMIC
David M. Thorup, Deputy Regional Representative, UNDP Malaysia, Singapore, and Negara Brunei Darussalam

Keynote Address

The Honorable Tan Chin Nam, Chairman, National Computer Board of Singapore

Break

Departure of Guest of Honour

10:15 Meeting Overview

Introduction of Participants

Briefing on Administrative Matters

11:00-12:30 THEME I: COUNTRY REGIONAL PLANNING SITUATION AND OUTLOOK IN THE CONTEXT OF INFORMATION SYSTEMS

Moderator: Hidehiko Sazanami
Rapporteur: Khalid Shams

(1) Information Systems and Technology for Regional Planning in Malaysia
Nik Ibrahim bin Nik Mahmood (General Manager, Kelantan Selatan Development Authority)

(2) Integrating Information System/Information Technology in Regional Development Planning in Malaysia: A Quick Review
Abdul Rahman bin Jamal (Director, Regional Economics, Economic Planning Unit, Prime Minister's Department)
Discussants: Michael Batty  
Colin MacAndrews  
Roslan Zaris  
K. S. Raman

12:30-  
14:00 Lunch (hosted by AMIC)

14:00-  
15:45 THEME I (Continued)

Moderator: Hidehiko Sazanami (Continued)

Rapporteur: Khalid Shams (Continued)

(3) Use or Potential of Information Systems/Technology in Regional Planning in the Philippines
Daisy Elena F. Aho (Senior Economic Development Specialist, National Economic and Development Authority, Region IV)

(4) Regional Planning Situation Report on Sri Lanka
R. B. Morapaya (Additional Director, Regional Development Division, Ministry of Plan Implementation)

15:45-  
16:00 Break

16:00-  
17:00 Discussants: Jerry C. Coiner  
Abdul Rahman bin Jamal  
Delia Torrijos  
Mana Sithikornkul

19:30- WELCOME DINNER (hosted by AMIC)
Venue: AMIC Lawn

TUESDAY, 1 NOVEMBER 1988

09:00-  
10:45 THEME II: INFORMATION TECHNOLOGY-BASED LOCAL/REGIONAL PLANNING: SELECTED COUNTRY CASE STUDIES

Moderator: Michael Batty

Rapporteurs: R. B. Morapaya and Delia Torrijos

(1) The Computerization of the Singapore Civil Service
Lee Kwok Cheong (Director, Project Management Department, National Computer Board of Singapore)

(2) Development of an Urban and Regional Planning Information System: A Case Study, by Roslan Zaris, Dading Sugandhi, and Peter Gardiner
Presented by Roslan Zaris (Sub-Director of Urban Planning II, Institutionalization of National Urban Development Strategy Project, Indonesia) and Peter Gardiner (Data Management Consultant, Directorate of City and Regional Planning, Indonesia)
Discussants: Joyce J. Elam  
Mohd. Yunus Tamin  
Daisy Elena F. Ano  
Chan Foo Tuck

10:45-  
11:00 - Break  
11:00-  
12:30  

**THEME II (Continued)**

Moderator: Michael Batty (Continued)  
Rapporteurs: R. B. Morapaya and Delia Torrijos (Continued)

(3) Information System for Rural Development in Thailand  
Kitisak Sinthuvanich (Chief, Monitoring and Evaluation Section, Rural Development Coordination Division, National Economic and Social Development Board)

(4) SETIA — An MIS Tool Promoting Development in Malaysia  
Mohd. Yunus Tamin (Deputy Director, Management Information Division, Implementation Coordination Unit, Prime Minister’s Department)

(5) The Role of Information Systems in Development Planning in India: A Case Study of DISPLAN on NICNET  
N. Seshagiri (Director, National Informatics Centre, Government of India)

Discussants: Erasmus D. Monu  
Khalid Shams  
Rachel Polestico

12:30-  
14:00 - Lunch (hosted by AMIC)  
14:00-  
15:45  

**THEME II (Continued)**

Moderator: Michael Batty (Continued)  
Rapporteurs: R. B. Morapaya and Delia Torrijos (Continued)

(6) Delivering Relevant Development Information to the Rural Poor  
Erasmus D. Monu (Director, Division of International Training and Outreach, International Institute of Rural Reconstruction)

(7) Community Information and Planning System  
Rachel Polestico (Training Coordinator, Philippine Partnership for the Development of Human Resources in Rural Areas)

(8) New IT Applications for Decentralized Development in Asian and Pacific Countries, by Nitin Patel and Khalid Shams  
Presented by Khalid Shams (Coordinator, Research Programme on Public Management Systems, Asian and Pacific Development Centre)
DISCUSSION GROUPS (DG): ACCELERATING IMPLEMENTATION OF INFORMATION SYSTEMS IN LOCAL/REGIONAL PLANNING: IDENTIFICATION AND ANALYSIS OF KEY ISSUES

DG 1: Economic, Financial, and Related Issues

DG 2: Project Design, Technical/Technological, and Related Issues

DG 3: Policy and Institutional, Political and Sociocultural, and Organization and Management Issues

WEDNESDAY, 2 NOVEMBER 1988

09:00-10:45 DISCUSSION GROUP LEADERS' PRESENTATION OF GROUP REPORTS

Moderator: Joyce J. Elam
Rapporteur: Rachel Polestico
DG 1 Leader: R. B. Morapaya
DG 2 Leader: Frank van Steenbergen
DG 3 Leader: Abdul Rahman bin Jamal

COMMENTS ON KEY ISSUES PRESENTED

Commentators:

Colin MacAndrews
Koto Kanno
Peter Gardiner

10:45-11:00 Break

11:00-12:30 THEME III: STRATEGIES TO GUIDE THE USE OF INFORMATION SYSTEMS/TECHNOLOGY IN LOCAL/REGIONAL PLANNING

Moderator: Jerry C. Coiner
Rapporteur: Koto Kanno

(1) Informative Planning: The Intelligent Use of Information Systems in the Policy-Making Process
Michael Batty (Professor of Town Planning, University of Wales at Cardiff)
Discussants: N. Seshagiri
Nik Ibrahim bin Nik Mahmood

12:30-14:00 Lunch (hosted by AMIC)
14:00-17:00 FIELD STUDY VISIT

National Computer Board of Singapore
Coordinator: Loh Chee Meng (Assistant Director, Planning Department, National Computer Board)

THURSDAY, 3 NOVEMBER 1988

THEME IV: INFORMATION SYSTEMS APPLICATION IN PLANNING

Moderator: Erasmus D. Monu
Rapporteur: Daisy Elena F. Ano

(1) Information Systems Applications in Regional Planning
Jerry C. Coiner (Principal, Remote Sensing and Information Systems Co., Kailua-Kona, Hawaii)

(2) Application of Information Technology in Small and Medium Enterprises in Singapore
K. S. Raman (Senior Teaching Fellow, Department of Information Systems and Computer Science, National University of Singapore)

Discussants: Claud Burril
Moehammad Budiman
Michael Batty

10:45-11:00 Break

11:00-12:30 Opportunity for Presentation of Voluntary Papers by Other Participants/Discussion of Research and Training Priorities
Moderator: Erasmus D. Monu (Continued)
Rapporteur: Daisy Elena F. Ano (Continued)

12:30-14:00 Lunch (hosted by AMIC)

THEME V: CRITICAL SUCCESS FACTORS IN THE DEVELOPMENT AND IMPLEMENTATION OF INFORMATION SYSTEMS/TECHNOLOGY IN LOCAL/REGIONAL PLANNING

Moderator: Benjamin V. Lozare
Rapporteurs: Abdul Rahman bin Jamal and Chan Foo Tuck
Critical Success Factors in Developing and Using Optimization-Based Decision Support Systems in Local/Regional Development Planning in Developing Countries
Joyce J. Elam (Associate Professor, Department of Management Science and Information Systems, Graduate School of Business, University of Texas at Austin)

15:45-16:00 Break

16:00-17:30 DISCUSSION
Moderator: Benjamin V. Lozare (Continued)
Rapporteurs: Abdul Rahman bin Jamal and Chan Foo Tuck (Continued)
Discussants: Michael Batty, Jerry C. Coiner, Erasmus D. Monu

19:00- FAREWELL DINNER (hosted by UNCRD)
Venue: Raffles Ballroom, Raffles Hotel

FRIDAY, 4 NOVEMBER 1988

09:00-12:30 FIELD STUDY VISIT (Optional)
Science Centre of Singapore

12:30-14:00 Lunch

14:00-17:00 CLOSING SESSION
Venue: Conference Room, AMIC
Moderator: Colin MacAndrews
Rapporteur: J. S. Edralin

Summing Up
J. S. Edralin

Conclusions and Recommendations
Drafting Committee Chairperson (Jerry C. Coiner)

Closing Addresses
Hidehiko Sazanami, Director, UNCRD
Benjamin V. Lozare, Joint Deputy Secretary-General, AMIC
APPENDIX 4: KEYNOTE ADDRESS

INFORMATION TECHNOLOGY AND GLOBAL ECONOMIC LINKAGES

Tan Chin Nam
Chairman, Singapore National Computer Board

It's a great pleasure for me to address such a distinguished international gathering. We, in Singapore, are indeed fortunate and honoured to be chosen to host this Expert Group Meeting on Integrating Information Systems/Technology in Local/Regional Development Planning. My congratulations go to the Asian Mass Communication Research and Information Centre (AMIC) and the United Nations Centre for Regional Development (UNCRD) for organizing this important event, and for attracting participants from so many countries.

Here in Singapore, the strategic importance of information technology (IT) was formally recognized by the government in 1981, when the National Computer Board (NCB) was established. This commitment to IT as an agent of economic development was reemphasized in 1986, when the government launched the National IT Plan as an important component of its new economic strategy.

In the context of Singapore, because of the small size of our country, the word 'regional' has an obvious international connotation. I have, therefore, adopted the theme Information Technology and Global Economic Linkages for this address.

The operations of today's multinational corporations (MNC) span the globe. An MNC may source for raw materials in South America, perform research and development in North America, manufacture components in Asia, assemble the end product in Europe, and export it to the whole world. In this way, an MNC could fully capitalize on the different comparative advantages existing in each country. Each of the countries in this value-adding chain would also be able to maximize its economic development potential in the process. This trend of globalization of business was reaffirmed by three panels of international participants, representing the US, Europe, and Japan, in the Global Strategies Conference held in Singapore last week.

IT plays an important role in supporting this business globalization aspect of regional development. It is, in fact, a critical element of the infrastructure supporting the coordination of business operations on a global scale. The kind of global business scenario which I have described would be impossible without a corresponding IT infrastructure.

Government has a meaningful role to play in developing the information infrastructure to support the globalization of business. A competitively priced telecommunication service with good international connectivity is an important prerequisite. Beyond that, value-added networks need to be developed to facilitate the exploitation of the telecommunication infrastructure.

For example, here in Singapore, the National Computer Board has been developing an extensive computing and data base infrastructure serving
practically every aspect of government. Recently, we began to apply the concept of electronic data interchange (EDI) to facilitate the interchange of information between government and the private sector. The first of such systems to be operational will be TradeNet, an EDI system serving traders, air and sea port operators, freight forwarders, transport companies, and the government customs and regulatory agencies. The data standards adopted by TradeNet conform to the internationally endorsed EDIFACT standards. This will simplify the linking of TradeNet to similar systems in other countries.

Seen from this perspective of global business, the design of government information systems need not be limited to just the operational requirements of government. Such systems could have much wider potential economic impact.

Information technology and information systems are making the world even smaller than air transport could. Just as we invest in building international airports, so must we also invest in information infrastructure. International economic cooperation and business linkages could reach new heights with the development of global information networks. I believe this is the ultimate contribution of IT to local and regional development.

You have a very interesting conference programme ahead of you for the rest of the week. We, at the NCB, are very much looking forward to your visit on Wednesday. Let me conclude by wishing you a successful meeting and an enjoyable stay in Singapore.
APPENDIX 5: WELCOME ADDRESSES

WELCOME ADDRESS

David M. Thorup
Deputy Regional Representative
United Nations Development Programme
Malaysia, Singapore, and Negara Brunei Darussalam

About four years ago, when I was dealing with the planning of new regional projects to be supported by the United Nations Development Programme (UNDP), I encouraged the Economic and Social Commission for Asia and the Pacific (ESCAP) to set up a facility which would help to advise and provide a means for consultation on technical requirements and technology choices in the management information systems (MIS) of governments in the region. Our motivation for such a project was the need of many governments to share their experience with others in order to help in defining the right options and, equally, to help steer clear of unnecessary waste and time lost through insufficient knowledge and ill-advised experiments and decisions.

Your meeting, which will soon be under way, only helps to emphasize how rapidly the resources of information systems and technology are expanding and reaching every part of our work and how quickly the sophistication of processes and techniques brings about the need to renew our knowledge, to update our approaches, and to do so by sharing our most recent experience with our colleagues from other countries. What you will be discussing during the rest of this week might, at first, seem to an outsider to be quite theoretical or abstruse, and yet my organization, UNDP, which is not actually making any substantive input to this meeting, is actively involved in supporting the use and practical application of exactly the technology which you are here to discuss.

A few months ago, UNDP completed a project, the second of two exercises in Malaysia which have worked to help improve the planning methods at the level of State Economic Planning Units. The first of these was in the State of Kedah, the latest in Kelantan. As you know, one of your speakers at the first technical session this morning will tell you much more about the use of IS in that same part of Malaysia, and no doubt will recall some of the work in which our planning expert collaborated.

Later this year, UNDP is planning to assign a pair of consultants to work in Malaysia in order to fulfill a special intellectual task which my Headquarters has decided to carry out on a global scale. UNDP has decided to prepare a series of monographs on Government Systems of Monitoring and Evaluation of Development Planning. One of the monographs will focus on the pioneering work of the Implementation Coordination Unit of the Prime Minister's Office. You will have this same work described to you by the Deputy Director of that Unit at your session tomorrow morning. It is a welcome coincidence that the Central Evaluation Office of UNDP has identified the very same government body, as a leading example of work in this field, about which you will also learn in detail.
Here in Singapore, UNDP is presently embarked on a very challenging project aimed at creating a Land Information Data Base. This is a pilot work, which, we hope, will provide an example to be replicated on a world-wide scale. The objective is to bring together, through a system which can allow access by all users, all data which are collected and maintained by all government departments concerned with land use and planning. The conceptual work leading up to implementation of the present project, as our keynote speaker knows already, was done by a member of his staff at the National Computer Board (NCB), who will also be participating in your deliberations.

As you can see, our association with many of the government representatives participating in this meeting is already very stimulating and fruitful. Certainly, the same can be said of our cooperation with our colleagues at the United Nations Centre for Regional Development (UNCRD), and it is for this reason that it is such an honour and privilege to be invited to assist in welcoming you all to this meeting. Of course, it is also a great privilege to participate in a meeting which is being hosted by our friends in Singapore. I am sure that you will find, during the brief period of your stay here, that your hosts at the Asian Mass Communication Research and Information Centre (AMIC) and in the Government of Singapore will be doing everything possible not only to make your discussions most fruitful, but to make your stay so enjoyable that you will go away feeling stimulated and inspired as well as grateful for the opportunity to work in this environment and enjoy this wonderful city.

May I, therefore, thank our hosts and wish you well in your work.
WELCOME ADDRESS

Vijay Menon
Secretary-General
Asian Mass Communication Research and Information Centre

It gives me great pleasure, on behalf of the Asian Mass Communication Research and Information Centre (AMIC), to welcome you to this expert group meeting.

Information technology (IT) has been described as the driving force behind a revolution in which we are all participating. We can then describe this gathering as a meeting of revolutionaries. Not destructive but constructive revolutionaries, fostering a beneficial revolution.

There are a number of critical issues surrounding the spread of technology. The appropriateness of technology-led growth is often questioned in the developing countries, for resources are usually scarce and alternative uses, many. And performance does not always match promise. However, with information technology, the question is not whether it will have an impact but how great will be the impact and how quickly it can be harnessed to moderate growth and development. Indeed, as a statement at a recent seminar (TIDE 2000) aptly summed it up, "information technology is a major new force in the development of our economies and societies." The implications of this force are so persuasive, so diverse, so radical, and so profound that almost no human action, no industrial and other economic activities, and no social organization will remain untouched by it.

But the exploitation and optimization of opportunities presented by IT call for planning. The initiative taken by the United Nations Centre for Regional Development (UNCRD) in organizing this meeting to examine the many aspects of integrating IT in development planning is both timely and highly commendable.

We are glad to have the National Computer Board (NCB) as a cosponsor. It provides an outstanding example of what planning and determined action can achieve. "NCB leads Singapore into the future," said a recent headline. That is indeed what it has done. To cite just one example, that of manpower development, the number of computer professionals has increased almost tenfold since 1980 -- from about 850 to 8,000. In the short span of its existence, the NCB has built up an enviable record of achievement. It is, therefore, ideally positioned to advise and assist other countries in the region in the adoption and utilization of IT.

The United Nations Development Programme (UNDP) has done invaluable work in assisting developing nations to acquire IT skills by providing equipment and expertise. We are glad to have UNDP's Deputy Regional Representative with us today.

We would also like to recognize and thank the International Development Research Centre (IDRC) of Canada which has sponsored some of the delegates to this meeting. It is also assisting us to computerize our documentation facilities and, more importantly, actively aiding the formation of regional networks.
For those of you who are unfamiliar with our organization, I would like to tell you briefly about AMIC. AMIC is a nonprofit regional organization, serving the cause of mass communication in Asia from its secretariat in Singapore. It was founded in 1971, with the joint support of the Government of Singapore and the Friedrich-Ebert-Stiftung, an independent foundation in the Federal Republic of Germany. Today, AMIC strives to assist in the raising of standards of teaching, training, research, and the practice of mass communication in the region. It does this through five principal activities: Documentation, Publication, Research, Training, and Consultancy Services. AMIC also organizes workshops and seminars, such as this one, at which problems of concern to Asia are discussed, issues clarified, and recommendations for action formalized.

What is most gratifying is the support extended to us by so many institutions and individuals. This is best exemplified by our seminar participants, many of whom have travelled long distances to be with us today.

I would like to thank our chief guest, the Honourable Tan Chin Nam, Chairman, NCB, for being with us this morning. His presence is indicative of his deep interest. It is my hope that the NCB will play an active role in any follow-up activities that may result from this meeting.
WELCOME ADDRESS

Hidehiko Sazanami
Director
United Nations Centre for Regional Development

As Director of the United Nations Centre for Regional Development (UNCRD), I am pleased to welcome the participants in this Expert Group Meeting on Integrating Information Systems/Technology in Local/Regional Development Planning. This meeting provides an opportunity for development planners, information and communication specialists, and scholars from nine countries and from United Nations and other international and regional organizations, to talk to each other and exchange information on the problems and ways of designing and implementing information systems (IS) and information technologies (IT) for planning. At present there is little communication and interaction between information specialists who produce the data and development planners who use the results. This lack of dialogue may lead to the creation of information systems/technologies far too sophisticated for, or irrelevant to, the needs of planners in developing countries.

The capacity of local/regional development planners to use new communication and information technologies for their development and planning duties and day-to-day tasks is an important concern, and is of special interest to UNCRD. We at UNCRD recognize that if development planning is to be improved, we must continue efforts to assist planners in strengthening their capability to formulate and implement effective plans.

Within this context, it is my expectation that this meeting will achieve its objectives, and that it will deliver a tangible product. I encourage participants to discuss and share their concerns, so that the report of the meeting will represent a consensus of participants' views.

No one could be more pleased than I am to join our host and collaborator, the Asian Mass Communication Research and Information Centre (AMIC), our cosponsor, the National Computer Board of Singapore, and our cooperating organizations, the United Nations Development Programme, the International Development Research Centre (IDRC) Regional Office for South East and East Asia, and the Department of Sociology of the National University of Singapore, in conducting this meeting. I believe that this expert group meeting represents the practical advantages of international and institutional cooperation in the solution of international development problems.

In many ways, UNCRD shares the same concerns as AMIC. Inasmuch as we are deeply committed to the same goals, it might be useful to look back and see how the UNCRD Research Project on Information Systems for Local/Regional Development has developed.

UNCRD initiated the project in 1983 and has been documenting and disseminating the research findings through publications and international seminars or meetings. The research findings gathered to date allow us to draw several firm conclusions about the use and effectiveness of information systems in support of development planning.
The first conclusion is that information systems for planning in developing countries are still evolving. The costs of developing information technology-based information systems are great, and the inadequacy of financial and information resources, and limited information and communication technologies, facilities, and technological know-how are among the fundamental constraints to improving information management in developing countries.

A second conclusion is that, although progress in the implementation of information systems projects has been slow, planning agencies are now beginning to recognize the value of systematizing information for more effective application in their planning activities. They are beginning to recognize that information systems have an important function to fulfill in local/regional development planning. Thus, the emergence of information systems projects is one of the more hopeful developments in local/regional planning in developing countries.

A third conclusion concerns the need for adequate training to harness information technology to enhance the quality of information for planning in developing countries. In particular, there is a felt need for training in the following areas: (a) Management skills and techniques; (b) Organizational change; (c) Economic and social development; (d) Planning and project methods, models, and implementation and monitoring and evaluation techniques; (e) Information systems, including understanding the organizational environment, establishing goals, the economics of information, information systems tools and capabilities, service delivery mechanisms, and effective provision of information systems capabilities; (f) Personal skills and attitudes; and (g) Training, including the training of trainers.

The ongoing UNCRD Research Project on "A Study of Critical Success Factors in Information Systems Implementation in Developing Countries" attempts to respond to this training priority. In order to respond to the main objective of the research project -- to develop strategies to guide the use of information systems/technologies in planning -- UNCRD decided to organize this expert group meeting jointly with AMIC.

To accomplish the objectives of the expert group meeting, the following issues will be discussed:

1. What are the critical factors that contribute to the successful implementation of information systems projects?

2. How should information systems/information technologies be used in the local/regional development planning process?

3. What are the implications of using information systems/information technologies in local/regional development planning?

These key issues will be extrapolated from the country experiences with information systems/technology and used to identify important lessons that can be learned about the continuity and sustainability of information systems projects in developing countries.

I urge the participants in this meeting to provide new insights and inspiration on the themes of the meeting, so as to improve the usefulness
of the results to developing country users. One of the outcomes of the meeting will be recommendations to improve the implementation of information systems/technologies for planning in developing countries.

In a final note let me state clearly that AMIC has greatly honoured us by collaborating in this meeting. Dr. Vijay Menon, Secretary-General was understanding of our purposes; and Dr. Benjamin V. Lozare, Joint Deputy Secretary-General was ingenious and helpful in finding ways and means to accomplish them. We are grateful to them and trust that they will accept our thanks on behalf of UNCRD. To all the members of the meeting we are grateful for their participation. Most of all we are grateful to Mr. Tan Chin Nam, Chairman of the National Computer Board, and Mr. David M. Thorup, UNDP Deputy Regional Representative, for coming to the opening ceremony to deliver speeches and to meet participants from different countries and from various development and planning organizations.

Thank you.
APPENDIX 6: AIDE-MÉMOIRE

SPONSORS

The United Nations Centre for Regional Development (UNCRD) and the Asian Mass Communication Research and Information Centre (AMIC) will be holding an Expert Group Meeting on Integrating Information Systems/Information Technology in Local/Regional Development Planning on 31 October-4 November 1988.

Organizers and sponsors: UNCRD and AMIC

Cosponsor: Planning Department, Singapore National Computer Board

Venue: AMIC Headquarters
39 Newton Road, Singapore 1130, Republic of Singapore

BACKGROUND

For a few years the UNCRD has sought ways to stimulate the interest of local/regional development planners in developing countries in the use of information systems (IS)/information technology (IT) in planning. Its research project on information systems has done a consciousness raising job -- by carrying out comparative case studies on the state of the art of IS for urban and regional planning in Asian metropolitan regions, on training needs in IS for local/regional planning in South Asian countries, and on the strategic use of IT for achieving a competitive advantage in public and private sector planning; by organizing the First and Second Kawasaki International Seminars and an Expert Group Meeting; and by publishing and disseminating the research results.

The 1986 UNCRD Expert Group Meeting on Training in Information Systems for Local and Regional Planning assessed the opportunities and limitations for training in developing countries, and looked into the potential benefits of international institutional collaboration in strengthening training capabilities and in promoting the development of IS for planning.

The forthcoming meeting is designed to assess the capability of local/regional development planning agencies to integrate IS/IT into their planning-implementation process. The meeting will look at both successful and unsuccessful cases to identify the factors that are most critical to project success. The meeting will provide an important benchmark in our learning process about the problems faced by planners in implementing IS. The findings of the meeting should help those implementing new IS projects in developing countries.

The meeting will serve as an international forum for institutions and experts involved in the application of IS/IT in local/regional planning.
OBJECTIVES

The specific objectives of the meeting are as follows:

1. To bring together the knowledge and experience of IS project managers, IS professionals, local/regional development planners, and scholars for the purpose of reviewing strategic problems and issues of integrating IS/IT in local/regional development planning in developing countries;

2. To review methodologies, approaches, trends, and practices concerning the application of IS/IT in local/regional development planning;

3. To identify "lessons learned" based on country regional planning situation analyses of information needs and on IS project case studies, and to discuss ways these lessons can be applied during IS project design and implementation;

4. To discuss the implementation issues that impact the successful integration of IS/IT in local/regional development planning;

5. To make recommendations to planners for integrating IS/IT in local/regional development planning;

6. To make recommendations to the meeting sponsors with respect to future research and training activities in IS.

The meeting is being held to review the results of Phase I of the UNCRD Research Project on "A Study of Critical Success Factors in IS Implementation in Developing Countries."

THEMES

The meeting will be organized around five major themes:

I. Regional Planning Situation Analysis in the Context of Information Systems

II. Information Technology-Based Local/Regional Planning: Selected Case Studies

III. Approaches, Methodologies, Problems of Integrating IS/IT in Local/Regional Planning

IV. Information Systems Applications

V. Implementation Issues in Integrating IS/IT in Local/Regional Planning

ISSUES FOR DISCUSSION

To accomplish the above objectives, the meeting will focus on the following issues:
1. What is a successful IS project?

A factors checklist that was developed by the UNCRD research project may be used to analyse the IS projects. The factors are: (a) clearly defined goals; (b) organization structure and policies; (c) resources (human and financial); and (d) technical strategy.

2. What are the appropriate methodological, technical/technological, and institutional approaches to IS/IT integration in local/regional development planning?

3. What is the effect/impact of IS/IT on local/regional development planning?

4. What are the IS project benefits and costs?

PAPERS/PRESENTATIONS

Papers/presentations will include: (a) Resource papers presenting an overview of selected concepts, trends, or issues; or providing a mix of scholarly advances, reviews of important developments, and applications; (b) Country case studies assessing information systems projects; or describing the design, development, and/or experience with a new IS/IT application; and (c) Country regional planning situation and outlook reports describing and assessing the regional planning process and the present situation, trends, problems, prospects in the adoption of IS/IT in regional planning.

EXPECTED OUTPUTS

The meeting will:

1. Generate resource papers, country reports, and case studies for possible use as resource materials for training courses in IS.

2. Document findings and recommendations to share with IS and planning practitioners;

3. Result in the publication and dissemination of a report and summary of proceedings and a book containing selected meeting papers.

PARTICIPANTS

Participants will include IS project managers, IS professionals, local/regional development planners, and academic and research institutions involved in the application of IS/IT to local/regional planning and administration. Representatives of relevant United Nations and other international development agencies will also attend.
For further information, please contact the organizers:

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About UNCRD

The United Nations Centre for Regional Development (UNCRD) was created in 1971 by an Agreement between the United Nations and the Government of Japan to promote local/regional development in developing countries. The principal aim of UNCRD is to enhance the capabilities of the developing countries in local/regional (subnational) development and planning. Towards this aim, UNCRD organizes training courses and seminars, promotes collaborative research on substantive issues in regional development, extends technical advisory services, serves as a forum for exchange of experiences, and disseminates publications which include the UNCRD Newsletter (semiannual), the Regional Development Dialogue (quarterly), books, meeting reports, and country bibliographies. UNCRD is organized into seven major operational units for undertaking research and training: (1) Urban Development and Housing Unit (UDHU); (2) Regional Development Management Unit (RDMU); (3) Environmental Planning and Management Unit (EPMU); (4) Regional Disaster Prevention Unit (RDPU); (5) Information Systems Unit (ISU); (6) Social Development Unit (SDU); and (7) Industrial Development Unit (IDU).

About AMIC

The Asian Mass Communication Research and Information Centre (AMIC) is a non-profit mass communication organization serving Asia from its headquarters in Singapore. It is jointly sponsored by the Government of Singapore and the Friedrich-Ebert Stiftung, an independent foundation in the Federal Republic of Germany. As a regional documentation centre, AMIC works in cooperation with UNESCO to promote dissemination of information pertaining to mass communication. In addition, AMIC also acts as an independent foundation charged with the responsibility of raising the standards of teaching, training, research, and practice of mass communication in the region. It meets this responsibility by convening conferences and seminars, by organizing refresher courses, by offering consultancy services and through a publication programme which includes a quarterly journal, Media Asia, a bimonthly newsletter, Asian Mass Communication Bulletin (AMCB), monographs, occasional papers, bibliographies, etc. AMIC was established in 1971.