INDEX OF INFORMATION UTILIZATION POTENTIAL (IUP) AS AN INFORMATION MEASURE

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by

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A.   INFORMATION MEASURES

Assessment of national information services has been approached through the use of two major methods. The first deals with a survey of the reactions and opinions of a representative sample of institutional and individual users of the services provided. This approach has been used in the evaluation of national as well as international systems such as AGRIS which has been assessed by LANCASTER and MARTYN (1) and BADRAN and others (2). Other evaluation studies using the survey method include the evaluation of MEDLARS by LANCASTER (3). It appears that this method cannot be applied as such for the evaluation of any other system. It may, however, suggest the type of questions that should be asked in other evaluation studies and, therefore , it could be modified for use in other applications.

Another method used in the assessment of national information services is based on the application of statistical indicators. The importance of these indicators, it is observed, lies not so much in the changes that take place in these values over time, since such changes will reveal improving or worsening situations in terms of the availability, accessibility and utilization of scientific, technical and other information resources within a

2

country. LANCASTER (4) discusses this point and provides some guidelines for developing a technique through the use of statistical indicators.

Some of the relevant studies towards the development of statistical indicators themselves include studies of some elements of information such as discussed by SANDOVAL (5), BUTTENKLEPPER (6), and PEREZ-GUINJOCAN (7). They conducted studies examining the quantity and distribution of articles on Latin America published in non-Latin American journals. The studies include the extent to which scientific and humanistic research conducted in Latin America is reported in journals of world prestige published outside Latin America. Studies which apply bibliometric methods are seen to be very limited to this topic in their scope as they do not cover the information infrastructure.

Other techniques include those which concern a particular environment such as a study conducted by KING (8) and KING (9). This work involves a study of statistical indicators of scientific and technical communication in the United States over time. While the study seems to analyze a variety of scientific and technical indicators, the analyses are limited to one country, the United States, and do very little in the way of comparison with social and economic indicators. This type of study is difficult to generalize and it might be impractical to apply it to developing countries, and to Saudi Arabia in particular.

3

Evaluation techniques which take into account the limitations of the previously discussed studies are few. McGRANAHAN (10) attempts to correlate measures of socioeconomic development. The study uses 73 variables which are selected to represent a range of development and structural indicators of both subjective and objective value. This study was sponsored by the United Nations Research Institute for Social Development (UNRISD). In another study, UNESCO attempts to use the same variables introduced by UNRISD to describe socioeconomic development for a study dealing with science and technology. The variables could not be used due to lack of generalizibility of the UNRISD study. It is worth mentioning that the above two studies give little attention to information activities.

In a more recent study, ERES (12) discusses the socioeconomic conditions relating to the level of information activities in developing countries. The author selects 100 variables from the World Bank's Tables for 87 developing countries. Through the use of factor analysis, the author selects socioeconomic indicators which represent a relationship with information activities. The conclusions of the study are general in nature where it seems difficult to focus the study on an information situation for a given country. The study excludes the capital surplus oil exporters, Kuwait, Libya and Saudi Arabia because they "represent unique circumstances not replicable in the remaining 153 countries covered in the World Bank's World Tables", ERES (13 p. 20).

4

B. <u>INFORMATION UTILIZATION POTENTIAL</u> (IUP)

The most recent study of socioeconomic indicators as they are related to information activities is the Index of Information Utilization Potential.

This study of Information Utilization Potential (I.U.P.) has been introduced by H. Borko of the Graduate School of Library and Information Science, University of California at Los Angeles, U.S.A., and M.J. Menou of UNESCO in Paris, France. It is a new method of studying the situation and infrastructure of information activities for a given country, a region or countries of the world. The study is referred to here as the technique.

The technique's objectives are to calculate the information utilization potential measures for a sample of countries to assess their internal and overall development, and to provide orientation for the development and maintenance of information indicators (12).

The development of such a technique is based on the need for a meaningful measure which should :

    1. Estimate a country's ability to receive, use and transfer information.

    2. Allow comparison of information levels among various countries.

5

3. Furnish a profile of a country's status
   in the various aspects of the information
   spectrum and level of advancement in
   information activities.

4. Help the information community to assess
   the state of a country's experience and
   progress in information utilization with
   a view toward implementing positive change
   and further development.

The development of an index of Information Utilization
Potential (I.U.P.) is a response to the need for a quantitative
measure of the information activities within a country and a means
of providing a rank order comparison of countries on the basis of
their ability to utilize information productively. The
Information Utilization Potential (I.U.P.) is intended to recon-
cile the various information measures, and complement them by
means of its coverage and organization. The approach taken by the
Information Utilization Potential (I.U.P.) project is to estimate
not only the quantity of information or intensity of information
activities, but the overall strengths and weaknesses of the
countries in relation to the whole cycle of information. For
this, the technique employs the use of a fairly large number of
indicators related to information needs and use as well as other
capabilities in information activities, such as geographical,
cultural or administrative indicators. The I.U.P. goes from the

6

measurement of information situation as it stands to the information situation that is likely to change by the inclusion of indicators (variables) relating to the dynamics of considered phenomena. This is particularly important in view of the rapid changes affecting most countries of the world and their information activities which are seen in rapid development (14).

The technique permits circulation of a meaningful set of information indicators, and in order to do so, it introduces two hundred and thirty (230) indicators of variables which are selected to represent the various facets of information situation in some selected cases. The two hundred and thirty variables are listed in the technique with a brief description of the procedures of deriving such variables. They are identified through the literature on national information policy and planning.

The technique aggregates the variables into two major groupings, structural and functional groups. The structural grouping of the variables is modified in order to secure a greater homogeneity of each group and to organize the groups in such a way that the variables related to environmental and information factors could be clearly distinguished and manipulated separately. The structural groups are listed as follows:

7

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SG    1.   PHYSICAL ENVIRONMENT
SG    2.   TRANSPORTATION INFRASTRUCTURE
SG    3.   POPULATION
SG    4.   SOCIO-CULTURAL ENVIRONMENT
SG    5.   GENERAL ECONOMICS
SG    6.   ADMINISTRATIVE CONTROLS
SG    7.   AGRICULTURE
SG    8.   INDUSTRY
SG    9.   HEALTH
SG   10.   FOREIGN TRADE
SG   11.   PUBLIC ADMINISTRATION
SG   12.   RESEARCH AND DEVELOPMENT
SG   13.   EDUCATION
SG   14.   LIBRARY, INFORMATION AND DATA SERVICES
SG   15.   OTHER INFORMATION COMPONENTS
SG   16.   INFORMATION MANPOWER
SG   17.   PRIMARY INFORMATION
SG   18.   MASS MEDIA
SG   19.   INTERPERSONNEL COMMUNICATION
SG   20.   TRAVEL
SG   21.   INFORMATION PROCESSING GOODS
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For similar reasons, the same variables are aggregated into functional groups. The functional groups are listed as follows:

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GS    0.   OVERALL CONTROL
GS    1.   INTENSITY OF NEEDS
GS    2.   DIVERSIFICATION OF NEEDS
GS    3.   GENERATION OF INFORMATION
GS    4.   RECORDING
GS    5.   REPRODUCTION
GS    6.   DISTRIBUTION OF PRIMARY INFORMATION
GS    7.   ACQUISITION
GS    8.   STORAGE
GS    9.   ORGANIZATION
GS   10.   DISTRIBUTION OF SECONDARY INFORMATION
GS   11.   ACCESS TO PRIMARY INFORMATION
GS   12.   ANALYSIS, CONSOLIDATION AND REPAKAGING OF
           INFORMATION
GS   13.   EXTENSION AND LIAISON SERVICES
GS   14.   USE AND ASSIMILATION OF INFORMATION
GS   15.   ASSIMILATION AND USE OF INFORMATION IN EDUCATION
GS   16.   EXPORTS OF INFORMATION
GS   17.   IMPORTS OF INFORMATION
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8

More methodological and calculation procedures are detailed in
the technique.

C.   APPLICABILITY OF THE TECHNIQUE

The developers of the technique do not claim that it is a
completely accurate one and they recognize its limitations.
However, the developers do feel that the technique is to be
viewed as a preliminary attempt to characterize and measure the
information utilization potential of a country using statistical
data accumulated for other purposes.   These information indica-
tors are selected after careful study of the literature on
planning, assessment, and evaluation of information activities
and systems.   The approach taken contributes toward the construc-
tion of a model that describes the behavior of information and a
nation's ability to utilize information.   A study applying this
approach lays the groundwork for the development of national and
international information policies (15).

It has beeen mentioned that the technique does have some
limitations that might be considered weaknesses of the technique.
One major weakness is that the technique uses statistical data
developed generally by international directories and statistical
yearbooks (16).   It is suggested that international statistical
yearbooks and directories are most of the time out of date
because of the lack of prompt provision of current data by a
majority of the members of international organizations.   This

9

particular weakness does affect the selection of countries, the collection of data, the time period on which the study should focus and, therefore, the results of the study and their validity and reliability. This difficulty of data collection and its effect on the study in general may become a greater weakness of the technique when dealing with countries which are developing rapidly (17). However, the technique seems to offer some guidelines and insight for a measurable investigation and could be used as a framework to assess the infrastructure of information activities in any particular environment for the following reasons:

1) the comprehensiveness of the technique in covering many aspects of socioeconomic conditions.

2) it attempts to relate the numerous socioeconomic indicators to information situation through its rationalization of the selection of the indicators.

3) it applies numerical indicators, which greatly facilitate characterization of the magnitude of information on related activities in various environments.

4) the technique is flexible enough to allow deletion and/or addition of certain indicators which might be characteristic of a particular environment.

5) indicators can be treated independently with respect to each other and the absence of some indicators may not affect the conduct of the study.

10

The above mentioned points may be considered as the positive aspects of the technique. However, the technique is seen to have certain negative aspects, such as the following:

1) the technique tends to be biased towards industrialized or developed countries as reflected by some indicators.

2) it allows estimation and approximation of missing values as substitutes of actual values.

3) the effects of some indicators on information activities are based on assumptions which have not been substantiated.

4) the results of the calculations of the various indexes of the technique seem to introduce suggestive instead of indicative conclusions. This may call for the use of other measures for further interpretation.

As can been seen, the positive aspects of the technique outweigh the negative aspects. Further, since there does not seem to be a similar technique employing a wide range of indicators, it is felt that the technique could be employed as a research instrument.

11

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12

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