ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

SCHOOL OF INFORMATION STUDIES FOR AFRICA

DEVELOPMENT OF AN INFORMATION SUPPORT SYSTEM FOR RADIO SERVICES IN TANZANIA

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF SCIENCE IN INFORMATION SCIENCE

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DEDICATION

This work is dedicated to my wife Angelina and our children Shubila, Mugisha and Muganyizi, who endured the inconveniences of my long absence from home.

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absence. Her contribution looking after our children and towards my achievement is undescribable.

ABSTRACT

This study investigated the Information Support System available for Radio Services in Tanzania, and presented possible ways of strengthening the existing information system and services. The main objective of the work is to develop and enhance the efficiency and effectiveness of Radio services in the country by facilitating access to timely, reliable, relevant, and adequate information to radio services developers, that is, planners, decision makers, executives and experts.

Among various aspects which the study investigated include: the information flow pattern; information resource sharing; application of information technology (IT); the kind of services offered by information centres; and how the radio services developers have benefited by these information centres.

The methodology used by the study takes the form of action research under the information analysis and consolidation. The tools used include a questionnaire to identify the information needs of potential users of the system, application of IT, and also to collect data for designing integrated and specialized databases. Secondary sources of information, on-site visits and interviews were also used for the purpose.

The results of the survey conducted show that the performance of information services supporting the radio services

development in the country are weak. This poor performance originates from ineffective information flow pattern; lack of co-ordination of information centres related to the development of radio services; inadequacy of data/information collection, processing, and dissemination, especially at the Directorate of Information and Broadcasting (DIB); low level of application of Information Technology (IT) in handling and dissemination of information; inadequacy of trained personnel; and absence of computer-based information services.

In order to overcome the shortcomings mentioned above, the establishment of computer-based information support system is proposed, its features elaborated and a plan for its implementation suggested.

The proposed Information Support System for Radio Services, the core of this study, outlines the ISSRS establishment, its management structure, functions, facilities to be used and budget considerations. The main ISSRS function will be to strengthen and enhance provision of information services with emphasis on value-added information products. Appropriate information infrastructure components are identified and their development recommended to ensure efficient execution of ISSRS activities.

The recommendations made following this study include: the establishment of National Policy on Information Systems and Services to direct information services in the country; user studies to identify the sectoral needs; training of workers and attracting/encouraging the available experts; reasonable

attention to be given by the government to information as an important resource for development; strengthening co-ordination among the institutions related to radio services development; improvement of IT application in the radio broadcasting sector; and establishment of the National Information System to co-ordinate the information services in Tanzania. These suggestions are expected to improve the information systems capacity and capabilities in supporting radio services development in the country.

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LIST OF ABBREVIATIONS

BBC	British Broadcasting Corporation.
BS	Booster Station.
CAS	Current Awareness Services.
CCS	Colon Classification System.
CDS/ISIS	Computerized Data System / Integrated Set of Information Systems.
CDTT	Centre for Development and Transfer of Technology.
COMBROAD	Commonwealth Broadcasting Association.
DBMS	Database Management Systems.
DDC	Dewey Decimal Classification.
DIB	Directorate of Information and Broadcasting.
ECA	Economic Commission for Africa.
ERP	Economic Recovery Programme.
ESAMI	Eastern and Southern Africa Management Institute.
ESAP	Economic and Social Adjustment Programme.
ESR	Education for Self Reliance.
GDP	Gross Domestic Product.
IDRC	International Development Research Centre.
IPP	Industrial Product Promotion.
ISSRS	Information Support System for Radio Services.
IT	Information Technology.
KBC	Kenya Broadcasting Corporation.
LAN	Local Area Network.
LC	Library of Congress.
MIB	Ministry of Information and Broadcasting.
MLTC	Makumira Lutheran Theological College.
MSTHE	Ministry of Science, Technology and Higher Education.
NBC	National Bank of Commerce.

NCA	News and Current Affairs.
NCL	National Central Library.
NESP	National Economic Survival Programme.
OPAC	Online Public Access Catalogue.
PADIS	Pan African Development Information System.
RDC	Radio Broadcasting Sector.
RO	Radio One.
RPFB	Rolling Plan and Forward Budget.
RTD	Radio Tanzania Dar es Salaam.
RTD (BS)	Radio Tanzania Dar es Salaam (Booster Station).
RVG	Radio Voice of Gospel.
SAP	Structural Adjustment Programme.
SDI	Selective Dissemination of Information.
SISA	School of Information Studies for Africa.
SISA	System Interface Search Assistance.
TANDOC	Tanzania National Documentation Centre.
TANESCO	Tanzania Electric Supply Company.
TBS	Tanganyika Broadcasting Corporation.
TIC	Tanzania Insurance Corporation.
TLA	Tanzania Library Association.
TLS	Tanzania Library Services.
TNA	Tanzania News Agency.
TR	Tumaini Radio.
TTC	Tanzania Telecommunication Corporation.
UDC	Universal Decimal Classification.
UDSM	University of Dar es Salaam.
UNO	United Nations Organization.
URTINA	Union of Radio and Television in Africa.
VOA	Voice of America.

VZT	Voice of Zanzibar Tanzania.
WAN	Wide Area Network.

CHAPTER ONE

INTRODUCTION

1.1. STATEMENT OF THE PROBLEM

The development of Radio Services in Tanzania using modern electronic computers spans over a period of more than fifteen years. The first computer was installed by the government in the studios of Radio Tanzania (RTD) in 1975. This was an ICT 1500 mainframe computer.[1]

In this period of more than 20 years, many developments have taken place although Tanzania's pace, for reasons common to many developing countries, has been modest. But certainly advances have been made. The number of computers in Tanzania, especially the micros, is still growing slowly; thanks to the Silicon chip revolution that has made Large Scale Integration (LSI) technology feasible, with consequent enhancements in computing power at greatly reduced hardware cost.

The selection and choice of computer products in Tanzania, is almost entirely dependent on the art of salesmanship. The type of computer equipment to be imported is actually under the full control of computer vendors; and donors, in the case of donated equipment. The subsequent customer or user will acquire any equipment that, in the vendor's or donor's view, meets the customer's or user's requirements. As a consequence, there are

access of under-and over-configured computer equipment dependent on the customer's financial ability.

Application of IT in Tanzania is considered broadly under two major areas, namely:

(i). General Data Processing Applications of routine nature such as payroll, accounting, stock control, etc. Such applications generate a lot of information for operational staff or desk officers, and relatively very little information for top management. They bear very little influence on decision making.

(ii). The second area is Management Information Application which includes intelligence applications such as population census, hydrological surveys and statistics, early warning systems, international trade statistics, etc. Applications in this category are brief and concise in reporting but they carry a lot of intelligent expertise. In turn they bear significant influence in the decision making process.[2] This study concentrates in this second area.

In Tanzania, there have been reasonable accomplishments in the category (i) type of applications and relatively very little is on record for category (ii). Assessing this situation in the context of the famous "Management Pyramid", one may say: a lot has been accomplished for the Operational Level; relatively little has been accomplished for the Tactical Level; and almost negligible service is rendered to top management or what is known as the Strategic Planning Level of Management.[3] In the

process, development of the technology suffers because it does not have much influence in the day to day affairs of the planners and policy makers.

Radio Services in Tanzania have been facing the same problems mentioned above. At managerial level, no computer-based information support system is existing. The intelligence applications for decision making is very little because of lack of expertise among planners and decision makers. The planners who are supposed to implement the decisions made, have been dependent on operational officers with computer expertise. Actually, the operational officers are the ones who influence the planners and decision makers on what type of computers should be acquired for information "Storage and Retrieval". As a result, there are different computer brands used in radio services in both public and private radio stations. This has caused different applications of computers within radio services, and there is very little co-ordination and co-operation among these important units in the society. For example, management, organization and exchange of information are facing problems because of lack of proper computer utilization.[4]

The role of radio services being to disseminate information relevant for national development cutting across all sectors, is still facing problems in the storage and process of information operations. Even the existing manual information support system for radio services is still facing the problems because of unsystematic application of IT. The survey conducted

shows that the types of computers used are minicomputers and microcomputers located in different places, for example, offices, studios and libraries with different utilizations. The types of utilizations have been found to be mainly, financial management and communication, for example, E-Mail. There is little use or none in intelligence applications, for instance, Database Management. The number of computers lying idle in each unit (that is, two public and three private radio stations plus seven booster stations), is more than the computers in use because of lack of expertise among the staff.

The absence of an efficient and effective computerization for radio services development in Tanzania has led to an ad hoc approach to planning, implementation of broadcasting policy, a move which has resulted to an unsystematic methods in the provision of services in the country.[5] The problems that have been experienced due to lack of a computer-based information support system for radio services, include: delaying and shifting of programmes; poor information coverage; long time preparation of programmes; incomplete programmes aired; provision of out-of-date and/or wrong data; and unnecessary repetition of some programmes. These problems have been caused mainly by lack of reliable, timely, accurate, relevant, and adequate information for planning purposes.[6]

The shortcomings highlighted above require a solution because Tanzania really aims at meeting its broadcasting sustainability goal, particularly, through organizing and developing the information system for radio services. This includes the

application of computer in utilizing the information facilities, resources and capabilities available in the radio broadcasting sector. In this regard, the study examines the information system particularly focusing on gaining a clear insight on the current practices, procedures and sectoral trend. This goes along with a view to proposing and recommending ways and techniques that can be employed to reorganize or reorientate the existing information system for provision of radio services in a more desirable way.

1.2. JUSTIFICATION

Computerization in Tanzania cannot be claimed to be full fledged. Much still requires to be done to promote the rate of utilization of IT in provision of various services.

In the case of radio services, networking is not yet installed for all radio stations causing a lot of unnecessary duplication of data and efforts. The former parent **Ministry of Information and Broadcasting** (now the **Directorate** in the Vice President's Office) which would install the central node for networking for the purpose of overseeing and guiding the development of broadcasting sector, concentrates on other matters, instead. These include, issuing licences to individuals or companies who ask for establishing private radio stations; or forwarding the individuals' applications for acquisitions of more computers to the Commission for Science and Technology. As a result, there is no arrangement for information resource sharing among these

institutions despite the fact that almost all have computer facilities. This is a great drawback to dissemination of development information in this sector.

The on-going acquisition of computers for only financial management and communication purposes will not at all improve the major role of this sector to the public, but such application will lead to the main responsibilities of radio services remaining stagnant.

The sound information base, today, is developed in any sector if there is a computer-based information support system. Timely, accurate, relevant and also adequate information required by broadcasting developers to enable them perform their tasks smoothly or effectively, is through having a reliable information system. Thus, in order to meet the information needs of the users, that is, decision-makers, planners, operational officers and experts for developing radio services in the country, there is a need for a systematized information system.

Given this understanding, therefore, a sustainable information structure has to be developed to co-ordinate information sharing in all interconnected sub-sectors so as to overcome the shortcomings mentioned earlier. In this context, the findings of this study are expected not only to bring a clear picture of the radio services, but also to improve these services in response to whatever shortcomings the study will reveal.

1.3. OBJECTIVES

1.3.1. General Objective

This study aims at investigating the existing information system for radio services in Tanzania. The general objective of this study is, therefore, to investigate the existing use and effect of computers at different levels with a view to making analysis and identifying the shortcomings; and later coming up with proposals and recommendations for establishing and improving information system through an effective and efficient computerization, in relation to radio services development in Tanzania.

1.3.2. Specific Objectives

For the purpose to achieving the general objective stated above of this study, the following specific objectives are considered:

1. To conduct a survey and analysis of the application of computers in the structure of the contemporary information system for radio services in Tanzania.
2. To examine the growth rate of computer acquisitions, types imported and their locations at managerial as well as operational levels in all radio stations.
3. To identify the types of computer utilization such as word processing, database or financial management, statistical packages, communication, etc.; and the kind of software in

use, for example, Micro CDS/ISIS, dBASE III and IV, Mini ISIS, etc.

4. To examine the methods of acquisition, storage, retrieval and dissemination of information in the existing information system.

5. To observe the information seeking behaviour/trend of the broadcasting developers in relation to their information needs.

6. To find out the status of establishment in terms of qualified manpower, training opportunities and availability of computer specialists.

7. To propose and recommend methods and techniques that would be employed to reorganize and reorientate the existing information system for provision of better radio services.

8. To design prototype information support system that will cater for the effectiveness and efficiency of acquisition, storage, retrieval and dissemination of information in the process of management of programmes.

9. To demonstrate how databases can be used to produce various outputs which would support the users engaged in the development of radio services in Tanzania.

1.4. SCOPE AND LIMITATIONS

1.4.1. Scope

The concern of this study is to examine the computerization in radio services in order to come up with the proposal of an

information support system that will facilitate the development of these services.

The following is the major sub-sectors or institutions engaged in provision of radio services, and therefore were selected for the study:

1. Ministry of Information and Broadcasting - Dar es Salaam.
2. Radio Stations:
   - Radio Tanzania Dar es Salaam (RTD) - Dar es Salaam.
   - RTD Booster Stations - Arusha and Dodoma,
   - Voice of Zanzibar Tanzania - Zanzibar.
   - Radio One - Dar es Salaam.
   - "Tumaini" Radio (Radio of Hope) - Dar es Salaam.
   - Radio Voice of Gospel - Moshi.
3. Data for Computer Acquisitions and utilization:
   - The Tanzania Commission for Science and Technology (COSTECH) - Dar es Salaam.
   - Ministry of Finance - Office of the Director of Computer Services - Dar es Salaam.
   - Bureau of Statistics - Dar es Salaam.

1.4.2. Limitations

As we have seen in the scope above, the study was conducted mainly within the broadcasting sector-that is, the then Ministry of Information and Broadcasting; and five radio stations plus two Booster Stations placed in different zones in the country. The study went into details of examining how each

of these individual information facilities operate to support the achievement of the
goals of research, planning and functional activities of the organs they serve.

Concerning computer acquisitions, types of computers and their utilization, the data were collected from only three institutions mentioned. This is due to the limited time available for this study. In those three selected institutions, the study did not go into details of how each of information facility operates, but only to know the types of computers used, their locations and their utilization in brief.

1.5. APPLICATION OF THE RESULTS

The findings of the study will determine the decision to make recommendations to the Directorate of Information and Broadcasting, how broadcasting sector can utilize better the computer facilities. This means, the Directorate will learn how the entire broadcasting sector can benefit from utilizing an efficient information system for effective information dissemination through the linkage of all the components of the sector.

The users in the radio services will benefit much from the information support system to be proposed by reorientating and reorganizing the existing information system. Since this sector

is very much in need of computer utilization, the results of this study will cultivate the users' interest leading to open grounds for more investment in computerization.

The proposal to be arrived at, will benefit the users, that is, decision makers in the Directorate of Information and Broadcasting; decision makers, planners, programmers, broadcasters, journalists, engineers/technicians, researchers as well as extension workers engaged in radio services development. The main reason is that, the system to be proposed will be a guide for the users to initiate the design, development and implementation of the new information system in the radio services in Tanzania. Another reason is that, often, people need changes and when they are introduced to new technique of performing their duties, they become interested, especially, in adopting modern technology.

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[2] Chris Ndamagi. "National Informatics Policies in Tanzania". A seminar paper on National Information and Informatics Policies in Africa, Addis Ababa, 28 November - 1 December, 1988., p.17.

[3] ibid., p.19.

[4] TOSHIBA. "Approval Drawing for the Development Project for Medium Wave Radio Broadcasting Network in the United Republic of Tanzania", Vol. 1, Dar es Salaam, July 1987., p.67.

[5] ibid., p.69.

[6] BBC Research Department. "Broadcasting Engineering: Transmission Systems Special Issue for Tanzania". London/Dar es Salaam, May, 1989., p.11.

CHAPTER TWO

METHODOLOGY

2.1. DATA COLLECTION AND ANALYSIS

The methodology used in this study is **Information Analysis and Consolidation**, that is, using all clear, efficient and effective structures of communication in data collection.

A combination of methods chosen for collecting data for this study has been determined by the available resources so as to produce adequate, reliable, precise and valid data.

The methods employed in the collection of data for this study were: Questionnaire, Interviews and Discussions, On-site visits and Observations, and Literature Survey.

The field work was conducted between August 1 and October 6, 1995.

2.1.1. Questionnaire

A designed questionnaire was divided into four major parts: (i). Institution's Profile; (ii). Information Needs and Use of the Information System; (iii). Computer-Based Information System Survey; and (iv). Expert's Profile. The questionnaire was designed and distributed in order to collect information about information systems in the institutions related to broadcasting; their methods of handling, processing and dissemination of information, with a view to ascertaining how

they collaborate with each other and the Directorate of Information and Broadcasting, in terms of data exchange.

Furthermore, the questionnaire was used to tap information for profiling institutions, information systems, projects and experts, in the radio broadcasting sector, as integrated databases; and programmes, audience and equipment as specialized (object-oriented) databases. A sample of the questionnaire is given in Appendix 2.

2.1.2. Interviews and Discussions

Interview and discussion schedules were arranged for the administrators and some experts, most of whom did not wish to go through questionnaire. Interviews and discussions were held to extract more details on how the information systems worked in their institutions. That is, the mechanism of capturing, processing and dissemination of information. Also, the other aim was to inquire: how, information being a vital resource for planning and decision making, was utilized; what were the main information requirements in development of radio services; the computer applications; major problems encountered in their day to day activities and how they solved them; how would the computer-based information system be helpful to them; and the general prospects of establishing ISSRS in Tanzania.

Interviews and discussions with some officers, especially at Radio Tanzania Dar es Salaam (RTD) were helpful in systems analysis of the computer-based information system to ascertain

what types of input (data/information), process (procedures) and output (information products and services) were generated to support radio services developers (planners, decision makers and experts) in the planning process.

Inquiries made in different radio stations, also, guided collection of information on the type of software, hardware, system configuration and expertise available in the sector. This aspect included examining whether the resources available in the existing information system constituted an adequate information support system for the radio services development process.

Experts (programmers, journalists, broadcasters, researchers and engineers/technicians) were interviewed to assess the extent of their interactions with other radio stations and the Directorate of Information and Broadcasting, in respect of communication of their findings and the problems that they faced in this regard. The form of interviews used were:
(i) **structured**, where predefined questions were asked in a particular sequence; and (ii) **unstructured**, where the answer to the one question was used as basis for another.

Overall, the interviews and planned discussions, were useful for fact finding in system analysis investigations, to familiarise
oneself with the system, and gain more insight, then identify possibilities of operational alternatives.

The list of persons interviewed, and the interview questions, are given in the Appendices 3 and 4.

2.1.3. Observations

On-site visits to: Directorate of Information and Broadcasting, Radio Tanzania Dar es Salaam (RTD), Radio One, Radio of 'Hope', Radio Voice of Gospel, Voice of Zanzibar Tanzania, and RTD's Booster Stations in Arusha and Dodoma, were undertaken to observe and get additional information about the information infrastructure and existing facilities in these places. However, much data were collected from RTD. On-site observation really supplemented the findings obtained through interviews and discussions. Through observation, the researcher assessed the procedures used in data capturing by the radio services developers.

Existing information inputs and outputs, were examined to gain insight into the type of information and formats which the radio service developers desired. Practices of information seeking behaviour of the radio services developers in relation to their information needs were determined. The aspects of qualified manpower in the broadcasting sector; the availability of computer specialists; and training opportunities, were also observed.

Browsing existing records enabled the documentation of information needed for the design of various databases. Chapter Six gives a detailed design of these databases.

On-site observation method proved to be quite useful in assessing the procedures followed in acquisition, storage, retrieval and dissemination of information, and some of other operations of the systems.

2.1.4. Literature Survey

Different libraries and information systems were searched to get the required information in the literature survey exercise. The literature survey process aimed at getting broader insight on how to develop (improve) the radio services using the available information sources on the sector.

The following libraries/information systems were searched as part of literature survey:

(i). Addis Ababa University Libraries and Documentation Centre;
(ii). University of Dar es Salaam Libraries;
(iii). Radio Tanzania Dar es Salaam (RTD) Libraries;
(iv). Radio Voice of Gospel Library;
(v). British Council Libraries - in Addis Ababa and Dar es Salaam;
(vi). UNECA Library; and
(vii). PADIS Database Resources.

2.2. DATA PROCESSING AND ANALYSIS METHODS

Analysis of surveyed data for the purpose of coming out with an optimal information system that would adequately support

broadcasting sector as a whole, was carried out as thoroughly as practicable. That is, the analysis of the existing information systems at seven radio stations surveyed, was conducted and documented using systems analysis techniques. The software packages that are available at SISA computer laboratory were applied in this analysis. Some of these facilities that have been used are:

- Word Perfect 5.1 for word processing.
- Micro CDS/ISIS for creation of prototype databases.
- Harvard Graphics in Processing graphical data.

The detailed analysis of data is presented in chapter five.

2.3. PROBLEMS ENCOUNTERED DURING DATA COLLECTION

Some of the problems encountered especially during the course of administering questionnaire and conducting interviews and discussions, are highlighted as follows:

2.3.1. Bureaucratic Procedures

One of the major problems encountered was that of the failure to meet relevant officers at their work places for interview purposes. In order to obtain appointments to meet most of the interviewees, the process involved lengthy bureaucratic procedures which require seeking permission or clearance from the personnel officers or department heads and setting appointment time with the earmarked people. As a result, much of the time was unproductively spent in trying to meet the

bureaucratic requirements and getting to interviewees and those intended to complete questionnaire.

For the questionnaire administration, most of the targeted officers were not available for the purpose of filling the questionnaire. Although attempts were made to request for appointments in good time, only few individuals honoured their appointments while others were not available for one reason or another. This pattern was common among almost all radio stations selected for study. Meanwhile, some of the respondents indicated that they would send the filled-in questionnaire to the researcher's address. Unfortunately, I did not receive any of these. I have used 12 completed questionnaire I gathered/received during the period of data collection.

2.3.2. Confidentiality

Access to a large part of information requested in the questionnaire and interview schedule, was not supplied because of its confidentiality. In the first instance, the officials were reluctant at all public institutions visited, for allowing the researcher to conduct the research. For example, at RTD, the researcher had to provide the research proposal and convince the authority that this was a normal activity which can be done anytime by anybody. Since it was approaching General Election (held in October 1995), RTD authority thought it was a political issue.

It was later indicated that only authorized officers were allowed access to certain type of information. This development involved getting the authorized officer in order to complete the questionnaire or conduct the interview. This could always happen when the researcher would be interviewing individuals about their information needs during programme preparation. Some interviewees could emphasize that some programmes are very sensitive and they get information from the government, thus, they cannot disclose the means of acquisition of such information.

2.3.3. Irresponsibility

Some of the responsible officers that the researcher earmarked or was forwarded to, could not be ready to be interviewed. They were sending the researcher to their deputies or their sub-ordinates, claiming to be very busy. This tendency of some people to run away from their responsibilities limited the researcher in getting more data/information as expected. On the other hand, some of the interviewees to be, could refer the researcher to their bosses claiming that they were not authorized to disclose some particular information or not allowed access to certain type of information. This situation contributed to wastage of time of the researcher.

2.3.4. Unorganized Data/Records

At some radio stations visited, the officers interviewed reported the existence of certain required information sources.

Nevertheless, they failed to retrieve them because of misplacement.

CHAPTER THREE

TANZANIA : BACKGROUND INFORMATION

3.1 INTRODUCTION

The United Republic of Tanzania is a union of the two sovereign states of Tanganyika and Zanzibar, formed in 1964. Situated between longitudes 29°E and 41°E and latitudes 1°S and 12°S, Tanzania has an area of 945,234 square kilometres of which 61,500 square kilometres is covered by water. To the north, Tanzania shares borders with Kenya and Uganda; to the west it borders with Rwanda, Burundi and Zaire; to the south-west are Zambia and Malawi; and Mozambique in the south. Tanzania occupies the coastline of about 800 kilometres bordering Indian Ocean to the east.[1]

Physically, the country falls into three main zones. The first comprises the islands and coast zone, the inland plateau, and the lake basins. The second zone is the great rift valley which runs into two forks northwards across the country. The third zone is a system of mountains which are at their highest in the north with the Mt.Kilimanjaro peak (the highest in Africa), and the southern highlands, and the break up of the uniformity of the central plateau in between. Tanzania is a country of climatic variety with five huge drainage basins which are important economically.

3.2 THE PEOPLE

Tanzania consists of four major racial groups namely Africans (98%), while Indians, Arabs and Europeans constitute the remaining 2%. The African population is composed of 126 ethnic groups with different tribal languages and cultures.[2] However, the use of a national language, **Swahili**, which is fluently spoken throughout the country, has strongly facilitated national unity, social integration and communication. English is being used for international communication and at institutions of higher learning. It is also a medium of instruction at the post primary education.

Tanzania's population has been increasing steadily. In 1961 at the time of independence, the country had a population of about 9 million. The 1967 census showed that the population had increased to 12.3 million. It was 14.9 million in 1975 as indicated in a national demographic survey. The 1988 population census gave the total population of Tanzania as 23.2 million. With an annual growth rate of 2.8% in 1988, the population of Tanzania is estimated to be about 28 million at present (1996).[3] A summary of the population between 1961 and 1996 is shown in Table 1.

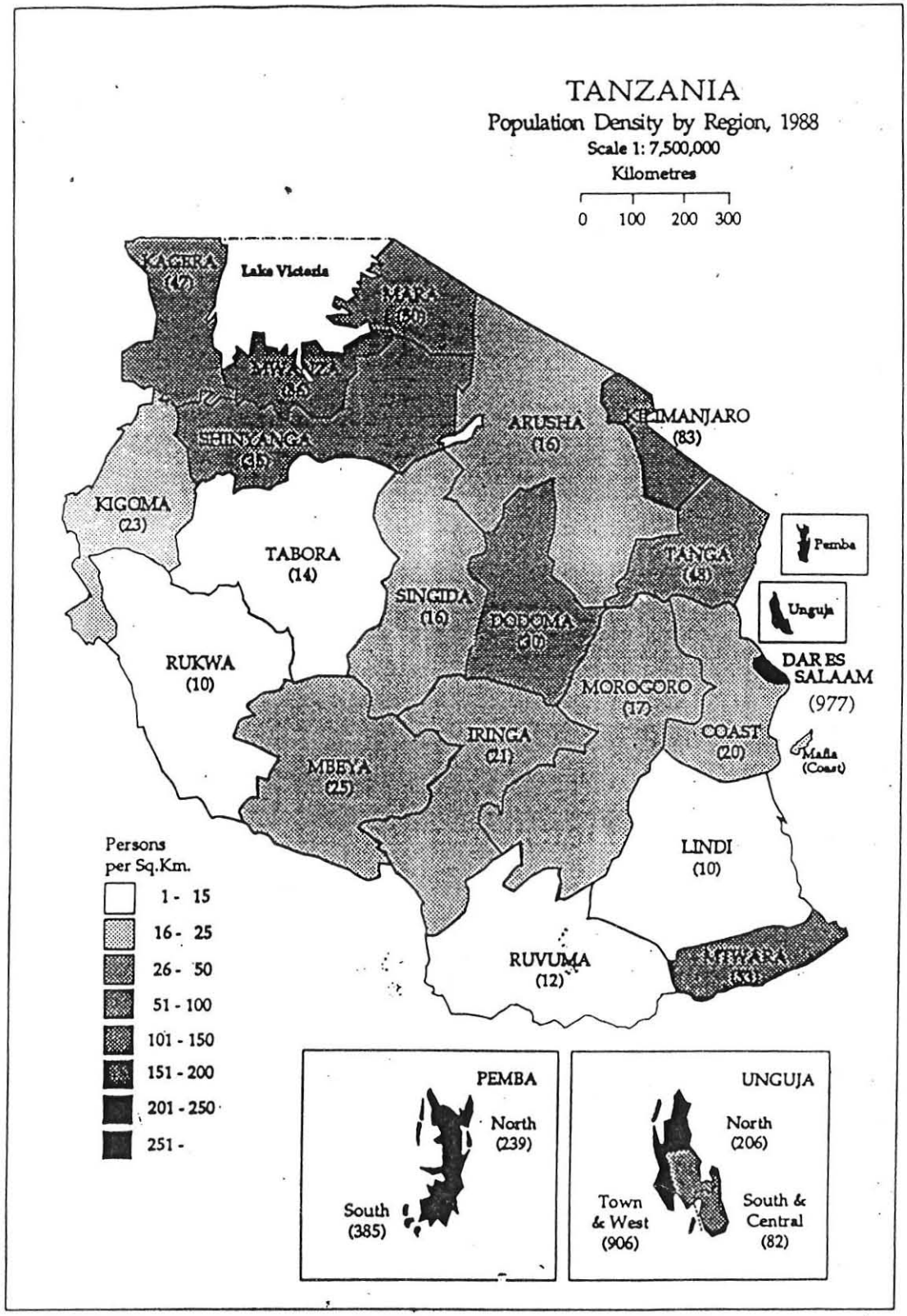
Table 1 : POPULATION GROWTH 1961 - 1996.

Year	Population (million)
1961	9 . 0
1967	12 . 3
1975	14 . 9
1988	23 . 2
1996	28 . 0

Source: Planning Commission. The Demographic Survey. Dar es Salaam: Government Printers, 1995.

The country's population is predominantly rural. Population density amounts to 30 persons per square kilometre with uneven distribution. Some areas are more densely populated with over 250 persons per square kilometre. The densely populated parts are those where agro-ecological conditions are favourable, such as Kilimanjaro, Mwanza and Dar es Salaam regions. On the other hand, there are parts that are sparsely populated with low and unreliable rainfall and mainly infertile soils, such as, Lindi Rukwa and Tabora regions. Moreover, the urban population is only 2.8 million (10% of the total population of the country) of which 50% are living in the capital city, Dar es Salaam.[4] Figure 1 elaborates the population statistics.

Figure 1: Population Statistics.



3.3 EDUCATION

The role of education in the development of the human resource, which is central for the overall development of any nation, places education activities in general and education planning in particular, in direct relationship with the other sectors in the Tanzania. Any changes in the national development priorities, for example, the introduction of the new technologies (which may require new and more sophisticated skills), will have an effect on education planning.

The importance of educational broadcasting cannot be overemphasized for accelerating the pace of national development in general, and for bringing about qualitative as well as quantitative improvement of education in particular. This is felt more significant in developing countries like Tanzania where socio-economic condition is yet to reach a take-off stage; and universalization of elementary education is not fully realized by the people, especially in the rural areas.

The brief historical education provision in Tanzania, indicates that, education in the country from 16th century to date, has gone through a series of changes due to administrative and political influences that have taken place. The indigenous education, first were influenced by Arabs and Christian missionaries, then the Germans, the British, and finally after independence of the country in 1961, the Arusha Declaration introducing a major reform, 'Education for Self Reliance' (ESR) in 1967.[5]

Using what was called "Voice For Development", (that is, the radio) from 1970, the two nationwide campaigns: 'Education For All' and 'Adult Education For Abolishing Illiteracy', were both successful. According to official figures, 93% of men and 88% of women, were literate in 1986; and more than 90% of children aged between 7-13, attended school. However, their percentage has fallen down since 1989, partly because of the decline in the quality and access to primary education. The percentage of children attending school was just below 50% and the adult literacy rate was estimated at 65% in 1993.[6]

In the period between 1970-1983, a proportion of total government expenditure on education was roughly at 12.5%. In the period between 1985-1992 it dropped to 6%. The government budget for 1992/93, showed some improvements in the allocation of resources to education which was around 8%.[7]

During the period of 25 years (1970-1995), major radio programmes in Tanzania have been for facilitating national priorities. In planning and production of programmes, the radio has been emphasizing the following priorities:

- Universalization of elementary education both formal and non-formal.
- Non-formal education for adults, linking education to economic and social activities.
- Development of vocational and professional skills.
- Promoting national unity and integration.
- Providing information about themes of national importance, such as, agriculture, population education, energy

conservation, preservation of wild life, environmental sanitation, nutrition and health.

- Popularizing science with a view to developing a scientific outlook.

In this way, radio services in Tanzania have been regarded as one of the major teaching tools for the national's development, named "Educational Broadcasting".

3.4 POLITICS AND MASS MEDIA

Tanzania is among developing countries in the world. But in spite of its economic problems - or possibly because of them - this country, in the 35 years since independence, has charted out for itself a distinctive and clearly defined set of social, economic, and political policies and priorities. Three themes have been predominant: the establishment of democracy within a single party system (today multiparty system); economic development within a framework of socialism (today market-oriented economy); and the reform and expansion of the educational system to suit the requirements of and to contribute to Tanzania's developing society.[8] Besides these themes, the people in Tanzania have freedom of speech and of religious within the law of the land.

Under one party rule, the party was functioning over and above the government. The function of the government was that of implementing policies that the party had put forward. National policies were practically prescribed, though the influence of

the party was less at the ministerial and local government levels. Throughout one party system, the radio was used as the 'mouth' of the party and/or the government. This practice had changed since 1992 with the introduction of the multiparty system and the market-oriented economy environment, which advocates economic and scientific feasibility of policies rather than political popularity in policy formulation. In 1994, 13 political parties were officially approved and registered by the registrar of the political parties.

Under multiparty system, socialism policy framework has been left in 'shelves'. Today, socialism is no longer effective after socio-economic crisis had started in mid 1980s.

Administratively, Tanzania is divided into regions, districts, wards and villages/streets. After 1995's general election, the country is currently ruled by Chama Cha Mapinduzi (The Revolutionary Party) CCM, the political party which was ruling under the one party system. The current President is not the chairman of the ruling party as it had been the practice before (though he is likely to be elected for this post). There is a Vice President and the Prime Minister under him. According to the constitution, the elections are held every five years. The President is eligible for election for two consecutive terms only.

It is well known that the radio has been assisting in the socio-economic development in various countries in the world. In Tanzania, the radio, besides being the 'mouth' of the ruling

party, has been capable to expose the corruption, graft ineptitude, bribery, mismanagement, and the outright embezzlement of resources meant for national development, by those trusted with the conduct of public affairs.

In this regard, a free press is more capable of unearthing corruption in the government. A free press is also capable of criticizing misconceived development projects. This is to say, a free press, more than a controlled press, can be more effective in assisting the development efforts.

However, the press is still not hundred percent free in Tanzania. The private communication channels, for example, radio, television and newspapers, seem to be open and 'vocal', utilizing the freedom given. Even though, some newspapers have been burnt. One television station has been threatened to be closed down if it would continue to broadcast 'unreliable' news. On the other hand, the public communication channels, for example, government and ruling party newspapers and public radio, have been and are still continuing to play the role of being part of the political propaganda.

While the press freedom in USA is expressly stated in the constitution, in Tanzania (as is in many African countries), it is silent and derived to individual freedom of expression. This is because the interpretation of freedom of the press varies from one country to another, in spite of the universality of the concept.

The relation between the Mass media and the government in Tanzania is still uneasy, especially the government against the private sector since the advent of multiparty politics in the country in 1992.

3.5 THE ECONOMY

Tanzania's economy, like that of many developing countries, is agriculture based. About 90% of population is engaged, directly or indirectly, in agricultural activities which provide about 50% of GDP, and more than 75% of foreign exchange earnings.[9] Table 2 shows the sectoral contribution to the GDP.

Table 2 : Sectoral Contribution to the GDP (in percentage).

Sector	Year and Percentage						
	1986	1987	1988	1989	1990	1991	1992
Agriculture, Forestry and Fisheries	58.9	58.9	62.7	61.6	56.9	54.1	54.9
Commerce and Hoteling	13.8	13.0	14.6	14.3	13.6	14.8	15.0
Transport and Communication	6.5	5.8	5.0	7.5	8.8	10.0	7.9
Finance and Commercial Services	6.2	5.5	5.0	5.7	5.9	5.5	5.0
Industry	6.2	7.4	5.3	4.5	4.5	6.6	5.4
Bank Services Income	1.8	3.2	4.5	5.4	6.1	5.4	4.5
Construction and Building	1.7	3.2	4.1	3.2	5.6	4.5	4.8
Electricity and Water	1.6	2.5	1.6	1.5	1.8	2.2	3.1
Minerals	0.4	0.3	0.2	0.3	1.2	1.3	1.7
Government and other Services	6.3	6.6	6.0	6.7	7.9	6.3	6.7
Total Average	100	100	100	100	100	100	100

Source: Planning Commission. The Economic Survey 1992. Dar es Salaam: Government Printers, 1994.

Since the mid 1970s, the country's economy has declined. The sharp rise on oil prices, low export commodity prices, Tanzania -Uganda war of 1978 - 79, and the break-up of East African Community in 1977, were among some of the reasons for declining of the country's economy.[10] Performance over the last five years has been encouraging, following measures taken under the government's Economic Recovery Programme (ERP) (1986/87 -

1988/89), and following successive years of favourable weather.[11]

According to the World Bank figures, in 1989 Tanzania's Gross Domestic Product (GDP) was equivalent to US$ 3079 million (at the 1987/88 exchange rates). The per capita income was put at US$ 120. The annual inflation rate declined from 42.9% in 1984 to 28.2% in 1985. However, the inflation shot up to 44% in 1986 before it was reduced to about 19% in 1990. Table 3 shows the country's GDP growth by sector, for a period of 5 years.

Table 3 : GDP Growth by Sector (in percentage) - (Actual and Projected growth).

Sector	Year and Percentage				
	1993	1994	1995	1996	1997
Agriculture	7.3	2.7	4.1	5.2	5.8
Industry	2.1	5.7	6.5	6.9	7.4
Mining	-19.1	8.9	10.6	11.4	12.3
Construction	-4.2	7.5	5.3	6.0	6.7
Services	4.0	5.0	4.9	5.9	6.4
Overall GDP Growth	4.1	4.4	4.8	5.8	6.3

Source: Planning Commission. The Economic Survey 1993. Dar es Salaam: Government Printers, 1994.

3.6 VEGETATION

More than half of Tanzania is covered by Miombo Woodlands together with bushland thicket. Wooded grassland occupies another quarter of the area of this country in scattered

patches. There is grassland in a little over one percent of Tanzania's land which is cultivated in widely distributed areas. About two thirds of the country is entirely uninhabited.

3.7 CLIMATE

Tanzania has a great diversity of climate conditions, with mean annual temperatures ranging from 24° - 34° C, while the mean annual rainfall varies from below 500 millimetres to over 2500 millimetres per annum. This situation depends on altitude and latitude.[13] The major characteristics of Tanzania's climate are governed by its proximity to the equator; the influence of Indian Ocean; and other large bodies of water in the interior.

In relation to the mentioned physical zones in section 3.1 above, Tanzania is divided into three main climatic zones:

The first zone is the warm and humid coast with temperatures seldom below 27° C during October - May period, and averaging 21° C during the year. There are two distinct rainy seasons between October and May. The short rains occur between October and November, and long rains occur from March to May. The period from June to September is mainly dry throughout the country with the main airflow being from south or south-east.

The second is the hot and dry central zone which lies between 500 metres and 1000 metres above the sea level. The mountain ranges from lake Nyasa (southern part) to Morogoro (eastern

part), give a large rainfall shadow over the central zone and the Masai steppe (northern part). As a result, the rainfall in this zone is rather low about 75 centimetres per year on an average.

The third zone is the semi temperate regions of Kilimanjaro and Usambara mountains which are in the north and north-east, and the southern highlands in the south-west of Tanzania. The topography of these areas has a marked effect on the rainfall. For example, in the south-west, the combined effect of the alignment of lake Nyasa and the local topography, causes large amounts of rainfall in Rungwe district. There is a similar effect of lake Victoria in Kagera region in the north-west of the country.

3.8 INFORMATION INFRASTRUCTURE

Information Infrastructure is the installed information components consisting of information resources, systems and services, such as: documentation centres, information centres, libraries, archives, computer centres, manpower (professional) training institutions, and data banks. However, for these systems to be effective, they need to be supported by other agencies dealing with generation, processing/enumeration and transfer of information, such as: the publishing industry, the statistical bureaux, the telecommunication system (i.e. the facilities) including informatics, and the mass media.[14]

3.8.1 Information Policy

Information Policy is a set of principles and plans for better handling and dissemination of information in the society. An information policy can be formulated at the institutional, national, regional or international level.[15]

In this regard, information policy is essential because it will be used as the government's commitment to do the following: (i) to place the information sector on its appropriate position; (ii) to be involved fully in the expansion and development of information infrastructures; (iii) to allocate enough funds to this sector; (iv) to encourage and utilize information technology (IT) properly; (v) to encourage and promote the effective generation and use of information in various sectors; (vi) to co-ordinate and channel all the information resources into national information systems and services;[16] (vii) to decrease the dependence of information from foreign countries which have different information needs; (viii) and most important, to conscioutize people through mass media channels to use information as one of the resources for solving their fundamental or crucial problems.

For a long time, Tanzania organized and ran its information infrastructure without any elaborate policy to direct them. However, the fast changing socio-economic environment in the world in general, and Tanzania in particular, has been drawing more attention of the country towards effective handling of information. The economic structural adjustment programmes

which were launched one after another in the 1980s, that is, NESP (1981), SAP (1982), ERP (1986) and ESAP (1989), had implications on the information infrastructure in the country.[17] The RPFB, a new approach to planning and budgeting introduced in Tanzania in 1993, singles out reliable data as the backbone of effective planning.

The opening up of Tanzania's economy to a more competitive economic ventures, meant that, planning in all sectors required more reliable information and data for the economy to be able to compete. This, however, calls for more efficient information infrastructure.

The 1990s have witnessed several measures being taken to improve the existing information infrastructure. In 1991, a study of existing information infrastructure in Tanzania was conducted. The study, among other things, came up with a proposal for the establishment of a National Information Policy on Information Systems and Services in the country.[18] At about the same time, Tanzania Commission for Science and Technology (COSTECH), prepared a project proposal on the establishment of a National Information System for Science and Technology.[19] Later in 1993, the government appointed a task force to review the Science and Technology Policy of 1985. The review aimed at rationalizing the policy with the changes which took place in the socio-economic policies starting in the 1980s as mentioned above. Among the important changes in the economy ere privatization of state owned enterprises or parastatals and the introduction of free market economy.

At present, the National Information policy proposed by Sekimang'a (1992), is the most comprehensive and articulate document for the effective mobilization of information infrastructure in Tanzania. It provides for all other sectoral information systems, of which broadcasting sector is one. In the proposal, the National Information Co-ordination Chart puts radio services sub-network under the Sectoral Sub-networks which are under the Directorate of Information and Broadcasting, in the Vice President's Office, the co-ordinating office.[20] Nevertheless, the government has not yet adopted the proposal.

3.8.2 Information As A Sector

Information has not been recognized as a sector, thus, it has been shifted and/or changed from one ministry to another. Sometimes it has been reduced to the department and sometimes upgraded to the directorate or division level. This is because there has been no information policy on information systems and services in Tanzania for more than three decades. Lack of clearly defined information policy has caused inappropriate placement of information as an important sector. Following, is the summary of changes showing how information as a sector has been moved from one ministry to another in the government structure.

Dates:	Placement of Information:
1960 - 1970	Main division in the Ministry of Information and Broadcasting - (information was regarded merely as news).
1971 - 1980	Directorate under the Ministry of Education - (influenced by the literacy campaign. In relation to this, information was considered as knowledge).
1981 - 1985	Directorate in the Ministry of Culture, Social Welfare and Information - (influenced by nationalism spirit under the ruling party's socialist ideology).
1986 - 1990	Department under the Ministry of Communication and Transportation - (influenced by the adoption of information technology (IT)).
1991 - 1995	Main Division under the Ministry of Information and Broadcasting - (influenced by information professionals

	after presenting information Policy proposal).
1995 - Todate	Directorate under the Vice President's Office - (the reason was to reduce a number of ministries after last November's General Election).

This trend has led to the following: information has not been realized, recognized and treated as an important sector on itself and as a resource for the national development; information infrastructures have been dispersed working or performing in isolation, thus, no close co-operation among them; information infrastructures have been weak because of being underestimated, allocated little funds, underutilized of the resources, especially manpower; and a very slow application of IT has been dominating in most of public institutions compared to private institutions. Therefore, it is clear that, the absence of formal and clearly defined information policy limits the commitment and the involvement of the government in developing the information infrastructures.

Moreover, it is still difficult to achieve a strong co-ordination and co-operation among information infrastructures and other institutions related to informatics. For example, presently, information is under the Vice President's Office; matters relating to IT fall under the Ministry of Finance; Telecommunication is under the Ministry of Communication and Transportation; then there is the Tanzania Commission for

Science and Technology under the Ministry of Science, Technology and Higher Education. These are four different administrations which could be two or even one if there was a separate ministry responsible for information. The current administration set up is bound to slow down the desired progress of information, IT, and information infrastructures in general, due to possible administrative bottlenecks and choice of priorities, in different sectors. This is one area to be effectively addressed by policy makers in the country.

3.8.3 Information Technology

Information Technology (IT) refers to technologies that pertain to human communication processes and the information they handle. It is the new science of the collecting, storing, processing and transmitting of information. It refers more particularly today to how computers store, process, and transmit information through, for example, satellite, telephone lines, teletext and cable.[21]

According to the survey conducted in 1992/93, Tanzania is at the Operational level (that is, the third level from the bottom) in the application of IT. The first level is called Initial, while the second level is Basic. The characteristics of this third level are as follows: There is extensive understanding of computer in government (and private) decision centres. Among the numerous computer installations, there are some very large machines. There are centres of education and training in computer technology and some centres of excellent

quality. They offer degree programmes in computer or Information Science. There is design and production of software and some manufacturing of hardware. Computers are affecting many disciplines, particularly science, engineering and medicine.[22] All these characteristics are identified in Tanzania except one. Some Tanzanians are developing software but there is no hardware manufacturing in the country. This is the only characteristic missing because in the country there is no semi-conductor and electronic industry to manufacture IT hardware. May be in the future because the strategy for IT development already exists.

Tanzania Commission for Science and Technology, from the time of its establishment in 1986, has been advocating for scientific information systems, including computer systems, as vital tools and components in strengthening the country's scientific and technological capacity. At the same time, the government has been and is still, working on strengthening the necessary infrastructure for appropriate implementation and development of IT.

The Planning Commission has stated that Tanzania is now trying to catch up with the next and last level - which is the stage of extensive managerial dependence on computers for decision making as well as strategic planning.[23] However, the situation is that, computers are very sparsely used. The few in use have not been utilized efficiently, due to lack of trained personnel, just as is in most other African countries.

Moreover, many institutions lack funds for purchasing computers and training their staff members.

3.8.4 Libraries

Libraries have historically been the major suppliers of information in Tanzania. Many Tanzanians and leaders in particular, have started to see the need for accurate and reliable information to be used in formulating policies and economic planning. The growing number of information sources made their work become more difficult as they have to attend to a wide and complex range of subject areas. These factors, plus many others, have, therefore, called for expanding library services in the country.[24]

The potential for the application of IT in most libraries in Tanzania, especially Special and Academic libraries, is quite high taking into consideration the fact that most of these institutions have access to computer facilities.

The use of computers is increasing in libraries and documentation centres in the country. This development reflects an increasing awareness among libraries in their value. In broadcasting sector, radio services in particular, each sub-sector (i.e. radio station) has its own library/documentation centre where the experts are utilizing the available material for their day to day activities.

3.8.4.1 Public Libraries

Tanzania has government owned public libraries maintained in 15 (out of 25) regional headquarters and other branches in 18 districts. This is the largest library system in Tanzania, called Tanzania Library Services (TLS), with its headquarters in Dar es Salaam, the capital city. The headquarters of this library system is called The National Central Library (NCL).

Besides providing lending and reference services to the registered members of the community, reasonable loans are offered to academic institutions, community centres, industries, etc. NCL co-ordinates the operation of all public libraries in the country.

However, a larger number of public libraries in Tanzania, are not well conversant with the applications to which computers can be used to provide better services. Another problem has been a severe shortage of trained manpower in the field of information. This situation is being rectified by conducting orientation courses aimed at equipping library managers with necessary knowledge and skills in library services, especially library automation.

3.8.4.2 Academic Libraries

In this group of libraries, the college and university libraries are considered. Tanzania has 18 institutions of higher learning and a good number of educational, commercial,

agricultural and other college libraries.[25] Among the institutions of higher learning, there are three universities: the University of Dar es Salaam, Sokoine University of Agriculture, and the Open University. The university libraries which are relatively better stocked and staffed, have not yet made effective use of IT. The traditional card catalogue retrieval system, is still the predominant method. This creates problems against easy accessibility of information sources.[26] The inadequate fund allocation to these libraries also reduces their efficiency in rendering services.

University libraries are important in disseminating new knowledge and ideas. The dissertations/theses, and research reports which are deposited in the library, constitute an invaluable source of new knowledge from different departments' research projects.

3.8.4.3 Special Libraries

Special libraries are maintained to support the activities of government ministries, parastatal organizations, non-governmental organizations, etc. For example, there are more than 30 libraries under the Ministry of Agriculture in its research centres and colleges.[27] The Special Libraries range from book corners to well built information centres , maintained by qualified personnel. This kind of libraries is the predominant in Tanzania. They are likely to be found in every institution/organization; where they cater for their users' information needs.

3.9 NATIONAL INFORMATION NETWORK

A National Information Network (or System), is basically a network of existing information resources together with new services for identified gaps, so co-ordinated as to reinforce and enhance the activity of the individual units, and thus, enable specific categories of users to receive the information relevant to their needs and abilities.[28] Management of national information network/system implies a policy plan to define priorities, a problem-oriented co-ordination of resources, and a systematic but flexible approach to information problems.

In Tanzania, Information Network for all sectors is not yet widely in place. Only a few parastatal organizations, such as, National Bank of Commerce (NBC), and Tanzania Electric Supply Company (TANESCO), have their own information networks because their information systems are computerized.

Tanzania Library Services (TLS) has stated clearly the types of relationships that would cater for national information system implementation according to UNESCO proposal guideline.[29] Briefly, the main types of relations between data centres, information services, and library networks stated are:

- an independent data centre network and an independent library network under the guidance of different governmental offices;
- an integrated data, information and library network under the same supreme authority, or under different but co-operating authorities;

- documentation activity included in the library network;
- library activities included in the data and information service network; and
- library network without data and documentation network.[30]

In addition, the main links of a National System of Information Services stated are:

- state authorities for planning and co-ordination of the system of service in the country;
- a national centre (or centres) for data, documentation and referral;
- a network of specialized (subject or mission) information and data services which would be gradually built up according to the needs of economic, scientific and technical development; they could include state-run centres and specialized centres of private enterprises, industrial centres, centres of agricultural research, etc;
- a national network of information collections, either independent or integrated with other services that have lending arrangements to cover information needs in special technical and scientific field;
- service centres to handle specialized materials and primary publication services, such as, patent literature, standard literature, translation, etc.[31]

The above points are well and clearly stated, but the implementation is minimal because of lack of: funds, co-ordination and co-operation among different public and/or private institutions.

Turning to broadcasting sector, the special library/documentation centres have been established in each sub-sector (i.e. radio station). Since these special libraries play an important role in the integrated system of information services, the establishment of a network for information and data exchange among these sub-sectors is necessary. The assignment of these specialized centres should be closely linked with the acquisition and collection of the relevant information sources in their subject (i.e. broadcasting) field. Each centre should utilize relevant information sources in the country or abroad.

However, the availability and dissemination of data via data centres are, in general, handicapped by the isolated locations of these radio stations and their low production of the national data. At present, each radio station uses its experts to search personally for the data they need and spend a lot of time and effort in doing so. As the result, few radio stations can analyze the gathered data and give out the same information; while the rest always broadcast different information about the same topic. In such case, it is desirable for all radio stations to launch programmes for systematic observation, collection, process and dissemination of relevant and reliable data to be used in their day to day activities. Therefore, the information system in the radio services in Tanzania, is to be restructured so as to become a strong or stable network in the sector.

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CHAPTER FOUR

RADIO SERVICES DEVELOPMENT IN TANZANIA

4.1 INTRODUCTION

The broadcasting medium is becoming increasingly important in developing countries, Tanzania being one of them. The importance of broadcasting falls in such areas as, literacy campaigns, distance learning, health education, agricultural and agro-meteorological information service, support to technology transfer, etc. These activities do not take place only in urban areas, but also in rural areas. Along with the expansion of media and broadcasting facilities, issues relating to the control of communication and airspace, freedom of and right to information, etc., have also arisen. Management of information broadcasting services covers not only allocation of frequencies to broadcasters, reservation of frequencies for defence and security purposes, but also the collection of audience statistics, licence fees, hire charges, etc.[1]

In this regard, information support systems are very much needed, for example, in: - channels and emission frequencies management;

- broadcasting network management;
- programmes management;
- equipment management;
- advertisements management;
- audience statistics;

- licence fees, hire charges and other revenues.

The information system that will be discussed in chapter 6, is mainly for supporting administration although it will also provide information to support decision making and planning.

Below, is an illustration of how radio services: technically and administratively, are developing in Tanzania.

4.2 THE SITUATION OF RADIO SERVICES IN TANZANIA

Tanzania is trying to develop radio service capabilities through the recently established policy which allows for competition between public and private sectors. Each side has shown the use of technology capability in day to day management, such as, collection of audience statistics, arrangement of advertisements, programme preparation, and broadcasting in general.[2]

Through the application of IT and considering the interest of the nation, the radio programmes prepared have shown how the use of radio can be integrated with socio-economic activities. The programmes have established a decentralized production and broadcasting capability, and created the sectoral structure for management of its use by a variety of the different field services and the people in villages.

4.2.1 Public Broadcasting Sector

This is the dominant and well established sector compared to private sector. The public radio was introduced in 1951, ten years before Tanzania's independence. This was called Tanganyika Broadcasting Corporation (TBC). After Tanganyika had united with Zanzibar in 1964, it was named Radio Tanzania Dar es Salaam (RTD) up to now.[3]

Tanzania islands (that is, Zanzibar and Pemba) have their own public radio named Voice of Zanzibar Tanzania (VZT). This was established in 1964. It is quite audible throughout the islands and other parts along the coast in the mainland, especially, Tanga, Morogoro, Coast, Dar es Salaam and Lindi regions. VZT is not very audible in southern, western and northern parts of Tanzania because it is not powerful enough to cover the whole country. Therefore, it is only RTD, the main public radio, which is audible throughout Tanzania and outside the country, that is, eastern, central and southern Africa. RTD is opened at 5^{oo} am and closes at 12^{oo} midnight, East African time. This means, it is on for 19 hours a day.

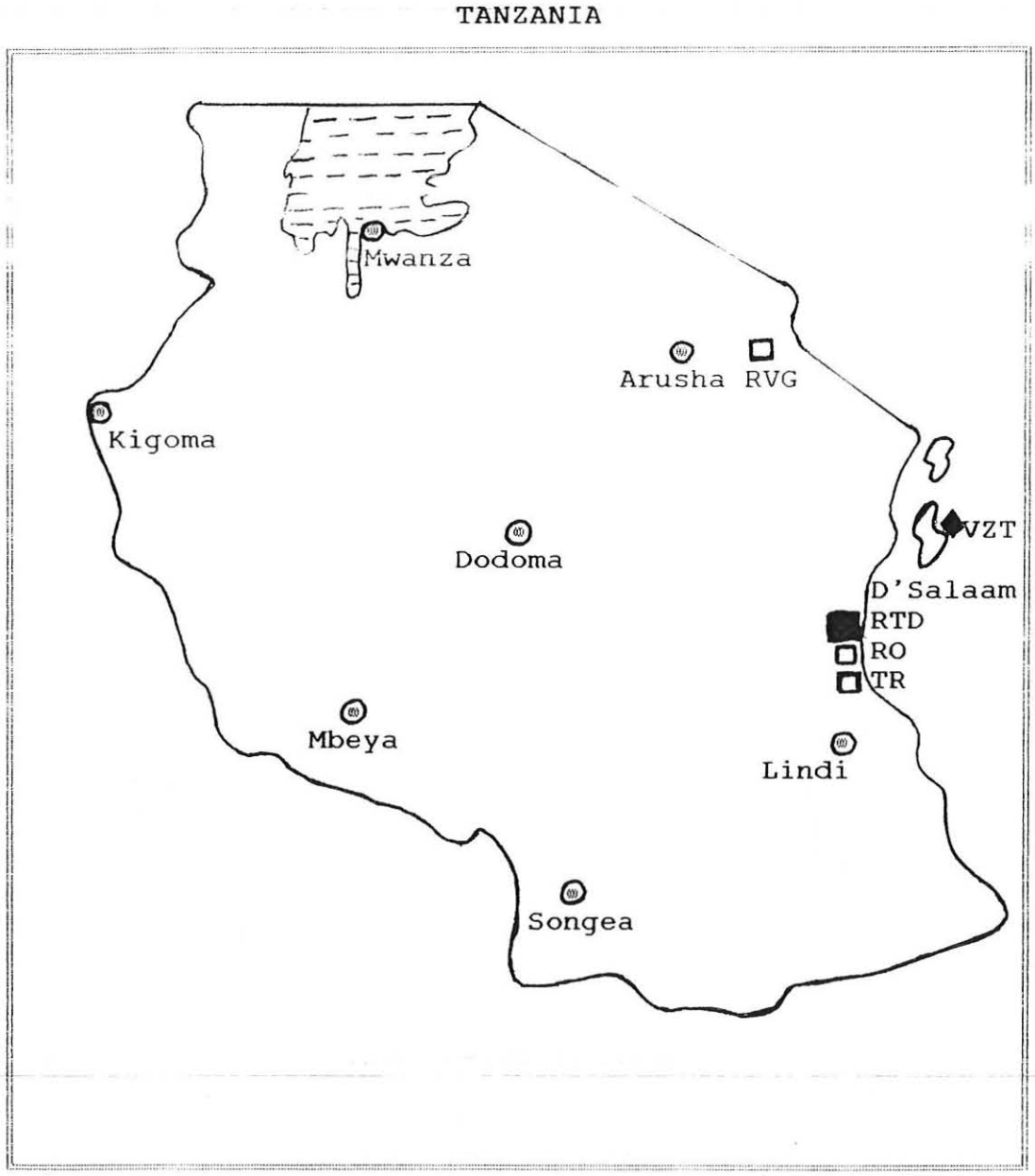
Being the dominant radio, RTD is based in the capital city, Dar es Salaam, with seven booster stations in different places in Tanzania. In each radio booster station, there are transmission facilities and experts, such as, broadcasters and technicians. Information needed by the head office is gathered by these experts, from rural and urban areas, and sent to Dar es Salaam, using fax, telex or telephone. The computer is not yet being

used. Moreover, some programmes are prepared in those radio booster stations and sent to Dar es Salaam. This depends on the capability of experts in those places. Some radio booster stations are able to prepare seven to ten different programmes which are aired by RTD, while some radio booster stations can prepare, may be, not more than five different programmes.[4]

Besides all these RTD's transmission stations, there is one station called RTD External Service. This is also in Dar es Salaam preparing and transmitting its programmes in English. RTD External Service does not work 19 hours a day but only eight. It is opened at 6^{oo} am and closed at 8^{oo} am; then opened at 12^{oo} noon up to 2^{oo} pm; and opened again at 6^{oo} pm and closes at 10^{oo} pm, East African time.

Below, figure 2 shows the distribution of the transmission stations in the country: public and private radios.

Figure 2 : The Distribution of public and private Radio Transmitting Stations in Tanzania.



Key:

- Radio Tanzania Dar es Salaam (RTD) Main Station.
- Voice of Zanzibar Tanzania (VZT).
- RTD Booster Stations.
- Private Radio Stations.

Broadcasting has become the matter of national concern and interest. This is because of the role played by RTD throughout its 42 years of existence. After independence in 1961, RTD's role was to act as "trustee" for the national interest. The Parliament and the Government had the right of ultimate control. In this sense, the director of RTD had limited freedom although he was told by the government to have executive power, and that he had to work as key person with great vision, initiative and imagination. As we have said in chapter 3, the radio has been used as the government's "mouth". Thus, RTD's director who could not consider that, he/she would be released of his/her post immediately. In such a situation, the director and other senior officials of RTD, could work unconfidently, without self-motivation, and also under fear.

Some experts, about 20, have been resigning and joining other radios outside the country because they have been underutilized and/or getting very low incentives compared to their tasks. Some of those experts joined BBC, VOA, Radio Deutsche Welle, UNO, Channel Africa (in South Africa), Radio Japan, Radio China, Radio Moscow, and URTINA.[5] Most of these experts are programmers and broadcasters of Swahili programmes in those radio stations mentioned.

The private radios established in 1993, got almost all their current experts (programmers, broadcasters and technicians) from RTD. These experts joined the private sector because of the attractive remuneration packages, which are offered,

including opportunities for further development, such as, training attachment and career prospects.[6]

By all means, the public sector under the powerful RTD, is still dominating, by far, all radio broadcasting activities in Tanzania compared to private sector.

4.2.2 Private Broadcasting Sector

This is a very new sector in Tanzania broadcasting system, being only three years old. With exception of one radio station (i.e. Radio Voice of Gospel), private radio stations were established in 1993. These are: Radio One, under IPP Group of Companies; and 'Tumaini' Radio (Radio of Hope), under the Roman Catholic Church. Both are based in Dar es Salaam.[8] Another radio to be established later this year, under a group of individuals, will be based in Mwanza town, northern part of Tanzania.

Radio Voice of Gospel(RVG), was first established 30 years ago, under the Lutheran Church. Ten years later, that is, in 1976, it was closed down by the government with the reasons not explained to the public. Radio Voice of Gospel resumed its services in 1993 when private radios were allowed to operate. RVG is based in Moshi town, north-east of Tanzania.

These three radios mentioned above, are low power stations compared to public radios. According to the waves produced by these private radio stations, they can be heard, during

daytime, between 300 and 500 kilometres by means of their ground waves. At night, through the medium of reflected sky waves, they are heard at greater distances because the sky waves are not absorbed by ground conditions as the ground waves are.[9]

Besides the above deficiency, broadcasters, technicians, and other experts from private sector, have contributed in the radio service development exercise. Many of the most innovative and successful uses of private sector expertise in broadcasting, have been in the education, health, and population. Some radios have prepared very good educational programmes, aired them, and then stored them in computers for further retrieval or rebroadcasting. This approach has attracted public radios to buy computers and invite experts from private sector for training of their staff. Some of the computer experts who have been going for such assistance, were former workers of public radios, who resigned and joined the private radios for better remunerations/packages. This example indicates ways in which communication skills and resources of the private sector can be drawn into directly developmental roles.

In other words, offering training locally, is a significant contribution and is highly appreciated by the Directorate of Information and Broadcasting. With proper government control, these training opportunities should go a long way in alleviating the prevailing problem of computer skilled manpower shortages in the public sector. The private sector has yet not

effectively gone into the areas of application of software support and related consultancy services. There are a number of software houses which have sprung up since 1992, but they are (and probably not) worth individual mentioning at this particular stage in time.[9] But they provide a service to some degree and the potential for growth is there.

4.3 TREND IN RADIO SERVICES DEVELOPMENT IN TANZANIA

"Development" is about the development of people as well as about addressing their physical needs. If it is logical to invest in education for the information and knowledge needed by children and adolescents, it is equally logical to invest in communication systems for adults and children not in school.[10] Communication systems(in our case broadcasting systems), like other systems, such as, transport systems, form part of the infrastructure for national development. Their role is the development of the people. Different broadcasting systems (radio and television) together form a sector which plays important role in macroeconomic planning.

In this regard, Tanzania government started to improve and expand radio services in 1970s. The aim was to make sure that RTD is heard throughout the country. The first radio booster station was installed in Dodoma (central Tanzania) in 1972. After four years, that is in 1976, three other radio booster stations were installed in Mwanza, Arusha and Mbeya. Five years later, in 1981, Kigoma got its radio booster station. Finally,

in 1985 and 1986, two radio booster stations were installed in Songea and Lindi respectively. It is now ten years (1986 - 1996) since RTD has been audible throughout the country and also outside Tanzania.[11]

From 1987, RTD's Dodoma, Arusha and Songea stations, were able to prepare some programmes. After the preparation they send them to Dar es Salaam to be aired. Today, programmes are prepared in all seven radio booster stations.

All RTD's booster stations use their experts to gather people's views and opinions concerning RTD's services. These experts report the gathered information to the head office in Dar es Salaam. All these have been considered as radio services development activities.

Since 1993, there have been a competition between public and private radios in providing services, especially, on business advertisements. Prior to 1993 decision of introducing private radios, RTD had enjoyed a virtual monopoly. Within this period of three years (1993 - 1996), Tanzanians have witnessed a tug of war between public and private radios. This is because before 1993, all business companies, whether public or private, had no choice, but only to use RTD for all their radio advertisements. This kind of competition has enabled both sides (public and private) to improve their services. They are now accurate in following up the customer's request to his satisfaction. Of course this is determined by the customer's payment(s).

Some experts in these radios have realized that different perception of information and of the broadcasting sector are possible and needed.[12] From their realization, experts in broadcasting sector have proposed steps to be taken by the government upon improving/developing radio services in Tanzania. One major proposal is that, better radio services will be achieved through developing the information systems in the sector by: establishing and strengthening co-ordination and co-operation among sub-sectors; improving information infrastructures by purchasing modern facilities and employing more experts; applying IT as soon as possible; and training of existing staff. The other suggestion was that of improving the information generation through conducting scientific research - that is, allocating funds for experts to conduct the research; and to establish the publishing industry in the sector.[13] In the following chapter, the discussion will point out how these suggestions were received by the government and what has been done up to now.

Generally, Tanzania government has, long time ago, realized the significance of broadcasting and how, specifically, radio services should be developed in order to contribute for national development.

4.4 INFORMATION NEED FOR RADIO SERVICES DEVELOPMENT

Information plays a vital role as an input to and output of every area of human endeavour cutting across all sectors. From

this fact, many nations have become aware of its importance, and they are properly organizing and managing it as a resource in their development activities.[14] Thus, we need information in order to get access to the knowledge generated, so as to utilize it as a problem-solving resource. Being a resource, information is always incorporated in the national development plans.

There are so many benefits when we assess the value of information. Some of these benefits are that information contribute to the:

a. Improved capability of a country to take advantage of existing knowledge and "know how" achieved elsewhere.
b. Rationalization and systematization of the country's research and development efforts in light of knowledge already available.
c. Wider knowledge base for the solution of problems.
d. New alternatives and approaches to the solution of technical problems, and options for minimizing future ones.
e. Improved effectiveness and efficiency of technical activities in the production and services sectors.
f. Strengthening Information Support Systems through the application of IT.
g. Above all, better decision-making in all sectors and at all levels of responsibility.[15]

Information is needed in broadcasting sector in order to: achieve the institutions' internal goals projected, and

externally to satisfy the public demands. This is in the form of Information Systems.

Information Systems do not operate independent of organization/institution; they exist to support organizational process and the achievement of the organizational goals. Information systems are therefore termed "Support Systems".

An Information Support System is a purpose oriented system that can help in problem identification and/or finding solutions to problems, or it may even be a goal seeking system. Such a system should be capable of presenting analyzed and synthesized data in readily usable form to different user groups at different levels.[16] The different sub-systems of an information system are always designed to relate to and be compatible with each other. The information support system is going to enable the institutions perform their duties better as required.

Three major aspects have combined to make information for radio services development so important. These are: the growing complexity of modern society; the introduction of scientific management; and computer technology. Information is essential to guide broadcasting developers in all main or basic activities they perform. In this regard, information is used at every level of this institution: from ordinary activities, such as, organization of workers' open files in the registry, or recording and filling the past news bulletins in the library, up to technical activities, such as, programme preparation or channels and emission frequencies management.

Therefore, in order to develop the radio services in Tanzania, the precise organization of information is necessary. This will be achieved by establishing the computerized information support system for radio services in all sub-sectors.

4.5 INFORMATION MANAGEMENT FOR IMPROVING RADIO SERVICES

Management is the process that involves guiding, directing, communicating, monitoring and evaluating a group of people towards organizational goal.[22] Management decides what the objectives of the organization are; what must be done to achieve them; communicate these objectives to the people whose performance is required to achieve them; and then determine how progress on the accomplishment of these objectives is to be measured.

Up-to-date information is critical for effective management. An early application of computers was the use of their data storage and processing capability for management. A large body of software now exists for management information systems in a wide range of applications. Computer technology is normally meant for avoiding the production of unimportant information, consumption of papers and bureaucratization in an organization/institution.[18]

In the case of broadcasting developers (planners, decision-makers and experts) in Tanzania, their work advances by agreements, plans, decisions and commitments in relation to

specific objectives of the sector and nation at large. An innovative
computer-based management information system is able to convey relevant data needed for these management activities for all involved in individual tasks.

4.5.1 Channels and Emission Frequencies Management

This is mainly the task of radio engineers and technicians. It is management activity which needs technical skills, especially in electronics and telecommunications. These managers (engineers/technicians) have enabled other managers, such as, programmers and broadcasters feel that their professions are possible. At the same time, the engineers and technicians have felt successful through the programmers and broadcasters. That is, when the former hear what has been prepared and announced is heard by the audience (radio listeners), they are satisfied with what they are doing.

The activity of managing and controlling the broadcasting "product", is not at all an easy task. It needs knowledge, skills and commitment. In the process of managing channels, the managers have to consider the standard broadcast band, which is divided into three principal classes: clear, regional and local.

A Clear channel is one on which the dominant station or stations render service over wide areas and which is cleared of

objectionable interference within its primary service areas and over all a substantial portion of its secondary service areas.

A Regional channel is one on which several stations may operate with powers not in excess of 5 kilowatts. The primary service area of a station operating on any such channel may be limited, because of interference to a given field intensity contour.

A Local channel is one on which several stations may operate with powers not exceeding 250 watts. The primary service area of a station operating on any such channel may be limited, because of interference of other channels.[19] All countries are permitted to use all regional and all local channels subject to power limitations and standards of prevention of objectionable interference. The clear channel is assigned to developed countries which have enough and powerful transmission facilities.

Having that in mind, the managers in Tanzania, can set up broadcasting equipment upon any wave-length desired and control their use. In most cases, the duties of these managers are to: (i). classify radio stations; (ii). prescribe the nature of the service to be rendered by each class of those stations; (iii). assign bands of frequencies or wave-lengths to the various classes of stations, and individual stations, and determine the power which each station shall use, and the time during which it may operate; (iv). determine the locations of stations, or classes of stations; (v). regulate the kind of apparatus to be used with respect to its external effects and the purity and

sharpness of the emissions of each station and from the apparatus therein; (vi). make such regulations not inconsistent with law as it may deem necessary to prevent interference between stations.[20]

All these tasks will be performed accordingly by Tanzanian managers in this department once they have modern and sophisticated equipment, such as, the computer.

4.5.2 Broadcasting Network Management

Radio broadcasting network refers to: a group of broadcast stations interconnected by leased channels on wire, microwave, or satellite to one or more central feed points for the purpose of receiving and rebroadcasting programme material of a timely nature. Networks make it possible to broadcast live programmes simultaneously to the public through affiliated radio stations; they make national and regional markets available to advertisers and offer stations quality entertainment and public service programmes.[21]

This is what the managers in Tanzania are supposed or expected to perform. Today, networks of terminals and computers are serving the needs of business, education, government, industry, medicine, recreation, and other forms of human endeavour. These systems, both public and private owned and operated, manage and direct the movement of data between stations (terminals, computers, and other sources of digitally encoded information) and across networks.

The advancement of information technology (IT) has reached the stage that, computers, networks and databases have introduced new media for communication and learning. But advances in digital technology are doing more than this: they are merging many of the familiar communication channels. The digital telephone and broadcasting can use the same satellites, transmitters and receivers or the same optical cables.[22] This calls for a concrete management to the broadcasting sector to take account of these interface.

In order to succeed, according to the above theory, we need facilities that will be networked. These are ground transmitting and receiving facilities, such as, radio uplink dishes of about 4.5metre-diameter to be allocated on the roof of a building; and receiving dishes between 3metres to 10metres in diameter to be at various radio stations. The sizes normally depend on the transmitting and receiving signal strength patterns of the orbiting satellite antenna. In this case, we need to be attached to the satellite distribution systems.[23] This means, these satellites remain essentially stationary with respect to terrestrial locations, approximately about 35,800 kilometres above the surface of the earth.

With computers, the target will be towards installation of Local Area Network (LAN) at each radio station, and thus, Wide Area Network (WAN) for all radio stations for data/information exchange and other messages.

4.5.3 Audience Statistics

The audience is the radio listeners, who without, the whole radio broadcasting activity is useless. Normally radio listeners are the majority in the community, especially, in developing countries which have very few television broadcasting systems. The true function of broadcasting relates quite specifically to the community it serves. It bears upon the needs, the differential needs, of that community. The function of the broadcaster or programmer is not to force his own opinions or attitudes upon his audience, but to listen to the voices of his community which express the needs and problems of individuals who are his listeners and viewers, and to attempt to satisfy these voices.[24]

Not all listeners like the same things. Some listeners prefer music, others local events, others news, others sports or stories or plays, others children's programmes, and many other programmes. Even if some listeners like music, their tastes differ depending on the type of the music. Therefore, if the radio station expects to provide a certain type of music, it must make sure that certain particular audience for such music is large enough to become a market which will support the station.[25] Another example is that, if a radio station expects to compete with the network outlets by stressing, say, sports programmes, it must make certain that there is a sufficient audience in the market, as well as sufficient events to make up a schedule.

Radio Tanzania Dar es Salaam (RTD), has been using a number of research methods (in current use) to assess the **size, nature** and **tastes** of its audiences. The common ones have been the sampling survey, questionnaire, interviews, and the special programme titled People's Opinions.

Sampling Surveys carried out in all 25 regions of Tanzania for 20 years (1974 - 1994), were used to measure the size of the RTD's audience and to get the information about the listening conditions and habits of the population. Listeners covering many parts of the country provided programme reactions and information about their reception conditions.

From time to time, questionnaires have been distributed to get listeners's reactions (for those who can read and write). These questionnaires have been targeting to cover a wider range of opinions on programme improvement and other radio services modifications. However, about 50% of the respondents were not active or co-operative to return the filled questionnaires to the relevant places.

Listener group, listener competitions inviting criticism of output, and analysis of letters, all have helped RTD managers to get a good picture of their audience and their tastes. In addition, visitors to Tanzania are normally interviewed and they give their opinions.

Feed-back systems are important tools in the process of management of all communication channels. In radio

broadcasting, audience statistics exercise include feed-back systems. This will not, however, substitute basic research aimed at comparative assessment of the social, economic, cultural and educational effects, seen from a broader point of view. The feed-back material and documentation are important source of information for the researcher who will use it extensively for the benefit of the broadcasters, programmers, engineers/technicians and also decision makers and planners. All the findings are to be diligently preserved for the purpose of being used as one of the major tools in planning for better service provision.[26]

Having received the findings of the survey, the managers have to go through the researcher's analysis and come up with a decision. This is to say, the managers should think of how to undergo the audiences' needs, requests, comments or views in general; what measures are to be taken; what programmes are to be deleted or introduced and why; which programmes should be given more emphasis/time and which ones are to be given less emphasis/time and why; etc. These are some of the questions which need answers in the process of improving radio services.

4.5.4 Programmes Management

The radio sets (and also television receivers) in many countries, have become part of everyday equipment to an extent which books, newspapers and other printed material, film, tape recorders and other communication media, are not. Radio broadcasting, therefore, contributes greatly to the shaping of

life of the family of man. This is because, most of the programmes broadcasted, whether in a form of play, music, lecture, interview, or documentary, etc., are very much educative. The educativeness of the programme is built-up upon the way it was planned, prepared and supervised; how the selected themes were incorporated and rehearsed; and the communication skills used for presentation (that is, the pace, rhythm and frequency of presentation). This is the 'programme management' referred to in this study. This task is always performed mainly by programmers and broadcasters.

The term 'broadcasting' signifies a specific process of communicating a message. As any other process of communication, it consists of three basic elements: (i). the message itself, its content and the manner in which it is presented; (ii). the medium through which the message is conveyed; and (iii). the recipient (audience) and his capacity to receive the message.[27]

Same programmes in various radio stations differ depending on how they are prepared. These deferences depend upon the level of communication skills, imaginations, initiatives, innovative ideas, environment and experience of the managers (that is, programmers and broadcasters) in relation to the needs of the community they are serving.

The responsibility for management and development of radio services is with these managers. At RTD such managers are called Programme Organizers (that is, Senior Programmers). Their responsibility include: formulation of policy; programme

planning, production, utilization, evaluation and feed-back; training of personnel; providing support material; and publicity.[28]

Management of the programmes by its nature must address itself to the mass audience. This is because, broadcasting generally must serve the national interests and goals. But it is also necessary that broadcasting should take cognizance of local needs, language differences, cultural variety and other similar factors. Therefore, besides national framework within which the priorities, broad area, themes, objectives, utilization and evaluation procedures of broadcasting should be spelt out, similar action should also be taken up at regional, national and even local levels. Planning, production and evaluation, should be a collaborative venture involving various experts from all sectors in the country. Even peasants may be involved in planning, production and evaluation for ensuring credo and reality in programmes.

In view of the above considerations, the authorities in broadcasting sector in Tanzania, especially in the Directorate of Information and Broadcasting (DIB), have been conscious to assist radio services development exercise in the country. DIB officials have observed the problems, obstacles and limitations hindering this sector, and now they are giving out guidelines to all institutions (public or private) providing radio services, so as to improve their services. Their main target of concern has been at programmes management.[29] We hope that these given guidelines by the government will be keenly followed by

the relevant managers in the broadcasting sector, plus their own views and initiatives, in the process of improving radio services in Tanzania.

4.6 PROSPECTS AND CHALLENGES

Much research worldwide have concluded that each medium of communication has advantages over others for certain purposes and in specific situations. Hence, if Tanzania government is to develop the capacity of its people and institutions, it needs to be concerned with the best use of all communication media.

Radio is the primary medium of communication in Tanzania, though newspapers and television are also needed. The radio is the most extended in the country, that is, about 80% of adult Tanzanians are radio listeners.[30] With the exception of the External Service of RTD (using English), all radio stations in Tanzania use the national language, Swahili, which is spoken almost by everybody. These are two aspects that give the decision makers and planners the strength when they are planning for radio service development.

In relation to the above factor, an example that can be realized is that, during the 1970 election campaign in the country, the Director of Elections pointed out that, the only way he could communicate last minute instructions to the election officers surpervising the campaigns and voting all over Tanzania's vast expanse of territory, was to broadcast them over the radio.[31] Only in this way could he be reasonably

sure that the vast majority of the supervisors in the rural centres would hear of a change of plan in time to implement it, whereas communication by post might take anything up to 10 days.

So long as there is no doubt about the language of communication and the number of radio listeners, the emphasis should be to encourage and attract the audience to listen to more programmes everyday. What the broadcasting planners should bear in mind is that, although information is a part of environment and an essential element of development, consciousness and understanding of it is just beginning to many thousands in Tanzania. Therefore, the best communication channel to disseminate information and reach the majority of Tanzanians, both in urban and rural areas, in a very short time, is the radio.

One way of improving the radio services is through application of information technology (IT). When we talk of the capability of solving problems and manipulation of data by performing prescribed operations (mathematically or logically) on data, and supplying precisely and immediately the results of these operations, we mean the application of IT. The techniques for storing and searching large quantities of data and making selected data available; the methods to recover specific information from stored data; and to communicate information in all forms, are performed better through application of IT.[32] This is a very big challenge in Tanzania, that, there is no way we can improve/develop radio services without IT application.

The computer has become essential to mass communication. It is without doubt the most important tool in the information age. It is rapidly becoming available to the mass market. The computers will soon be used by the audience of the radio almost as much as the broadcasters. The computers will indeed allow audiences to become part of the communication process, participating in the organization of messages to fit their requirements.[33]

The radio will not be so much for entertainment but for information, education and work. The radio is going to change people's way of life because the major use of radio will shift to information and education. If that is the case, the number of programmers, broadcasters, journalists, technicians and other experts will grow, for they will be called upon in ever-growing numbers to: gather, process, and make judgements about the data that will be put into the storage banks for personal and specialized use. This will offer greater access to information than is available today.

However, this success in Tanzania will depend upon the decision makers and planners who will give out decisions and plans; plus operational officers who will shape the radio services through implementing those decisions and plans.

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CHAPTER FIVE

ANALYSIS AND EVALUATION OF INFORMATION SYSTEM AND SERVICES IN TANZANIA: FINDINGS OF THE STUDY

5.1 INTRODUCTION

This chapter presents the analysis and evaluation of information systems and services that support radio services development in Tanzania. The chapter also analyzes the information requirements of the radio developers (decision makers and planners) and experts (journalists, programmers, broadcasters engineers/technicians and researchers). The findings of this study will also identify the existing information flow pattern in different radio stations and the shortcomings of the existing situations.

A large part of our discussion will cite Radio Tanzania Dar es Salaam (RTD) main station as an example because this is the biggest and well established institution in the sector. Moreover, most of the gathered data were obtained from RTD main station in Dar es Salaam.

5.2 INFORMATION SYSTEM AT RADIO TANZANIA DAR ES SALAAM (RTD)

5.2.1 Institutional Structure

Radio Broadcasting unit falls under the department of Broadcasting which has two units: Radio Broadcasting and Television Broadcasting. This is one of the two departments, which are: Information and Broadcasting. These two departments form the Directorate of Information and Broadcasting (DIB). This directorate is currently placed in the Vice President's Office.

RTD being the public institution, is directly answerable to the directorate of Information and Broadcasting. The director of RTD is nominated by the President of Tanzania but normally it is DIB which propose the name and send it to the President's Office. DIB again nominates RTD's deputy director and heads of departments, the team which form the management of RTD. This RTD management nominates heads of RTD's booster stations.

RTD has four departments namely: Administration, Programmes, News and Current Affairs and Engineering. The section of libraries is under the department of programmes, while accounts section is under the Director's office. With about 500 employees all over the country, RTD's institutional structure and the formation of its departments are shown in the following figures:

Figure 3: Institutional Structure of Radio Tanzania Dar es Salaam (RTD).

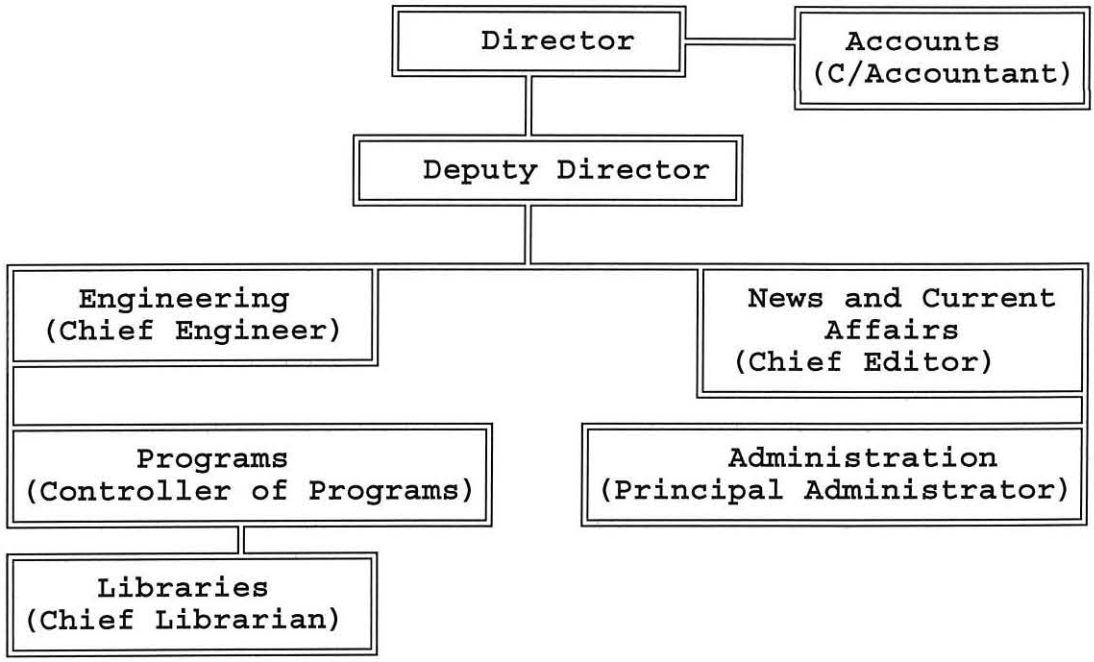


Figure 4: Department of Engineering

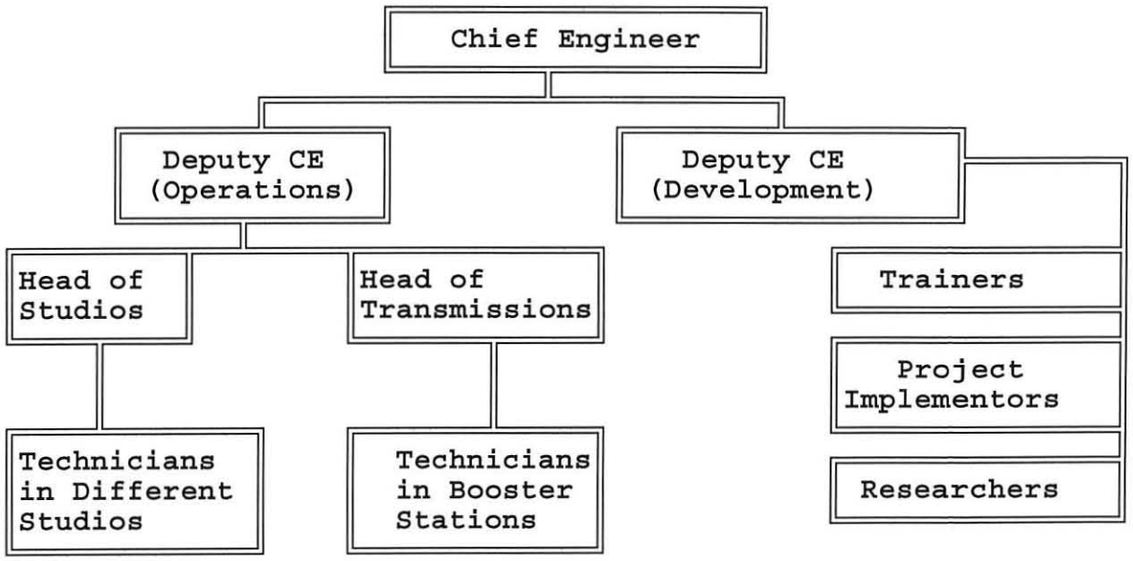


Figure 6: Department of News and Current Affairs

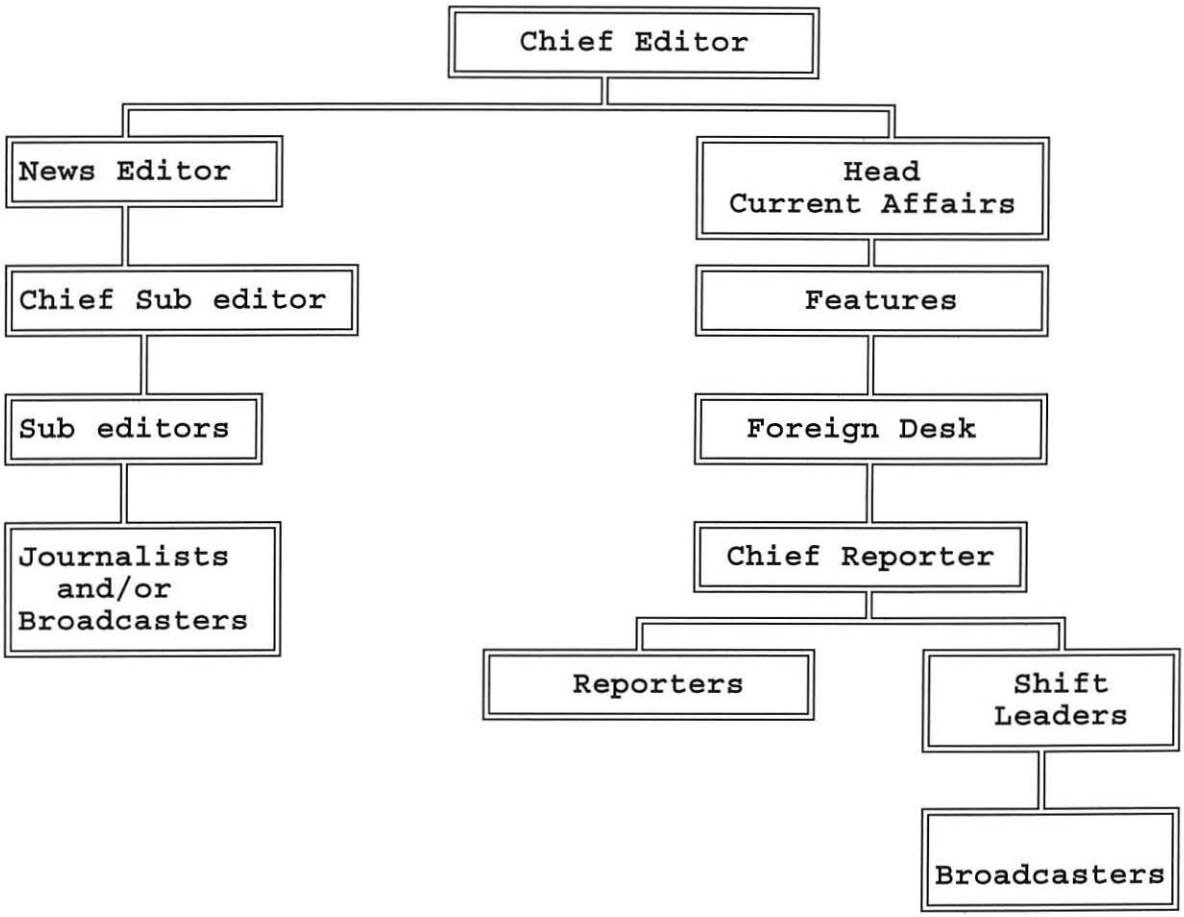
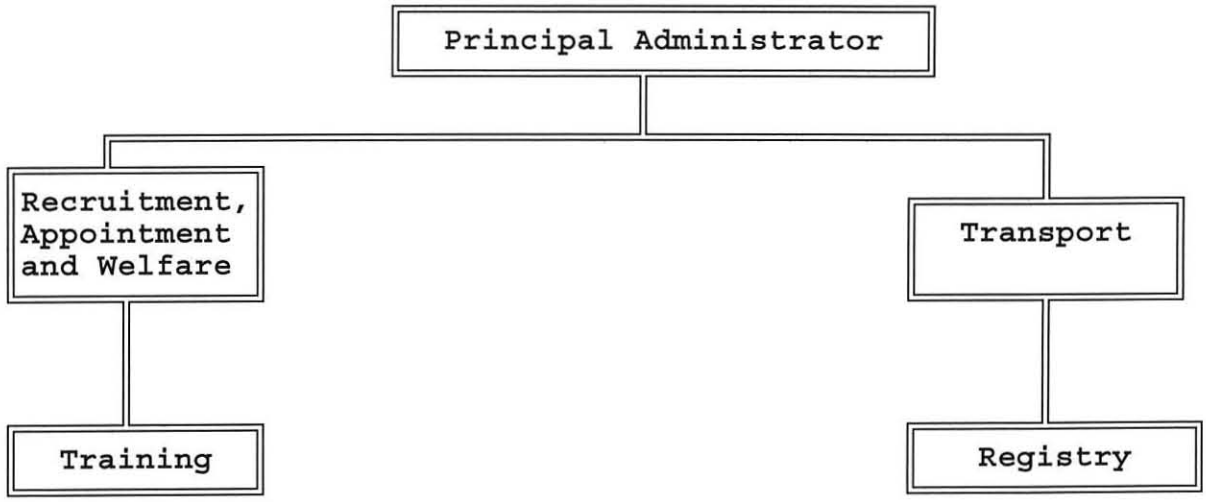


Figure 7: Administration Department



5.2.2 The Information Support System

There is a Library with various books, journals, research reports and newspapers supporting Radio Services Development at Radio Tanzania Dar es Salaam (RTD). This library was established to cater for the information needs of the four RTD's departments shown in the section 5.2.1. This Library of Documents (as used to be called), seem to have enough material according to the purpose it was established for, but it is not well organized. At the time of the survey (September 1994), this library had been in operation for 25 years. However, the documents available at that time were not properly catalogued or classified. Some documents were grouped in order of the subject they addressed in broadcasting and mass media in general. Other documents of other fields, such as, Political Science, Geography, Music, Sociology, Religion, Information Science, Art, Management, Engineering, Medicine, Philosophy, etc., were placed in the labelled shelves according to these fields. This temporary arrangement devised by RTD is called "In House Based on Subject Matter Classification".

Both the Chief Librarian and the person in charge of the Library of Documents, explained that, there were plans to develop this Library of Documents of RTD to enable it meet the needs of the Radio Broadcasting tasks. Some of these activities expected to be taken (as mentioned during the survey), include:

(i). cataloguing/classifying documents using one of the internationally known cataloguing and classifying methods, such as: the Library of Congress, Dewey Decimal Classification, Universal Decimal Classification, etc.;

(ii). identification of information needs of decision makers, planners, journalists, programmers, broadcasters, researchers and engineers/technicians at RTD and in the whole broadcasting sector with a view to organizing the library of documents to meet these needs;

(iii).establishing linkages and exchange of data and information between RTD and private radios so as to strengthen the information system;

(iv). computerizing the information system to make it more efficient and effective.

Other information systems besides the Library of Documents are: Library of Music, Library of Programmes and Library of Events. These three libraries are often used by programmers and broadcasters.

According to the arrangement in the Music Library, the biggest library among the four libraries at RTD, it was realized that, Music Library could provide original music composed to evoke a wide range of human emotions and information, such as: happiness, sadness, melancholy, conflict, liveliness, danger,

the future, the ancient times, religious/educational/commercial aspects, the military, environment, the country, love affairs, marriage life, childhood, and many others.[1] This Music Library has been providing music arranged according to the subject matter, in a variety of styles and textures. The Programmers and broadcasters are the main users of this library everyday by going through the documents and selecting the suitable music (discs or tapes) for the programmes they are preparing. The users fill the special form for borrowing music facilities. Below, figure 8, is the requisition form that belongs to Tape Library (within Music Library).

Figure 8: The sample of the user's requisition form for borrowing music facility from Music Library

R.T.D. TAPE LIBRARY
REQUISITION FOR TAPE TL/ NO. 0125

Name of Borrower_____

Name and Date of Programme_____

TAPE NO.	TAPE NO.

Authorized by_____
Head of Section_____
Designation_____
Kindly return tape(s) quickly after Programme.
Signature of Borrower and Date_____

This arrangement was claimed to be permanent even after computerization of the system. However, it could be better if there would be two kinds of forms: one for issuing tapes and the other for issuing discs. This is because in other Libraries (i.e. Library of Events and Library of Programmes) the materials they issue are also tapes. Therefore, one form could

be titled: R.T.D. MUSIC (TAPE) LIBRARY while the other one could be R.T.D. MUSIC (DISC) LIBRARY.

5.2.3 The Application of Computer

All four libraries at RTD are not computer-based systems. However, the institution has seven computers, IBM microcomputers. One is located in the Director's office; another in the Chief Engineer's office; the third one is placed in the office of the Co-ordinator of Projects; the fourth is located in Chief Accountant's office; and the rest three are in the newsroom. Three microcomputers are IBM PC PS/02 modes 386SX HAS 1.44" floppy disc drives, 101 key board, VGA colour monitors, each with a parallel and two serial ports and memory capacity of 2MB and a hard disc capacity of 80MB. The other four are IBM XT 286 machines and all have floppy disc drives of 3.5", 101 key board, VGA colour monitors, each with a parallel and two serial ports and memory capacity of the range of 512K and 640K, and a hard disc capacity of 32MB. These computers are stand alones, and at the time of the survey, their applications had not extended to activities related to information storage and retrieval. In the newsroom the journalists were using the computers for preparing (typing) news scripts. In other offices the computers were used for clerical activities, such as preparing letters.

One engineer with computer skills but who has no access to the available computers in the institution (RTD), commented that, "In this institution computers are only 'glorified

typewriters'. What I mean is that the computers here are just for secretarial duties".

The software found in use at RTD was Word Perfect 5.1. Other software available but not in use were Micro-soft Word for Windows, dBase III and dBase IV. These dormant software could be used in creating and maintaining records of documents and statistical data in the information system.

5.2.4 Mode of Dissemination of Information

The information system is still not well organized. The methods used to disseminate information are mainly statistical outputs of various kinds of data for radio broadcasting and current affairs; for the requests of users; and for users reading the documents. There is no Current Awareness Services (CAS) and Selection Dissemination of Information (SDI) offered presently.

5.2.5 Information Users

Although the Library of Documents is open to all staff of RTD, it was established specifically to cater for the needs of mainly programmers, researchers, engineers/technicians and somehow broadcasters, journalists and administrators. The administrators (that is, the director, deputy director and heads of departments), have not been using this Library of Documents claiming that they have enough material in their offices for their day to day activities. Some administrators said that, they were mainly dealing with files and that in most

cases they did not need referral information from the library of documents. Other administrators lamented that, they could go in the library to read newspapers, but they were receiving newspapers in their offices. However, all administrators appreciated the importance of information in successful handling of their activities. Meanwhile, the actual users of this Library of Documents (programmers, researchers, engineers/technicians and broadcasters), raised concern that there was inadequacy of relevant and up to date information to suit their needs.

Majority of respondents, stated that the usefulness of the Library of Documents was largely confined to radio services development. As this is a multisectoral activity, they recommended that, information ranging from all sectors should be generated and disseminated to enhance the capacity of planning and decision making for the radio services development.

5.2.6 Data Sources

The Controller of Programmes with the support of Chief Librarian, expressed concern that, up to the time of the survey, the government , through the Directorate of Information and Broadcasting, did not provide adequate financial support to help the library acquire adequate information from different sources to meet the users' demands. It was also mentioned that, the way of collecting data and information from various institutions related to radio services development, was not

quite systematic. The Chief Librarian revealed that, at that time, the Ministry of Information and Broadcasting (currently the Directorate of Information and Broadcasting), was working to design special kind of forms to be filled every three months, by all radio stations, to facilitate data collection on: radio resources utilization; audience demands; programmes development - that is, changes and improvements; technical equipment requirements; training - that is, demands, opportunities, fields, duration and sources of sponsorships.

The following were identified as the sources of existing data and information output in the system at the time of the survey:

- Research reports conducted by RTD, The Directorate of Information and Broadcasting, VZT and Radio One;
- Data and information gathered by Tanzania News Agency (TNA).
- Socio-economic survey conducted by Bureau of Statistics, COSTECH, Ministry of Finance and The Prime Minister's Office;
- Radio Services Development Annual Reports from the Directorate of Information and Broadcasting and RTD;
- Statistical data and information from different Ministries/Sectors compiled time to time;

- Reports (annual/time to time) from foreign broadcasting agencies/corporations, such as, BBC, VOA, UNO, URTINA, Commonwealth Broadcasting Association (COMBROAD), KBC, Deutsche Welle, Channel Africa, Radio China, Radio Japan, etc. These data sources are captured by the 'Foreign Desk' in the department of News and Current Affairs at RTD. It is a daily activity known as Foreign Radio Monitoring.

5.3 USERS REQUIREMENTS ANALYSIS

In order to ascertain the information requirements of different categories of people in the process of radio services requirements analysis, a survey was conducted. This survey used interviews and the questionnaire. Responses received from different administrators and experts (who would eventually be the users of the proposed information support system) show that:

The programmers mostly needed the socio-economic information from Tanzania and outside; the current affairs, from inside and outside Tanzania; and audience requirements, - for preparing general programmes.

The programmers again needed specific facts from various fields in all sectors, for example, geographical environment of the country or a specific part of the country, population statistics, economic growth, education development statistics at different levels, technological advancement, political

situation, agriculture, forestry, fisheries, energy, minerals, telecommunications, transport, industry, trade, health, etc. What was revealed is that, the information and data from any sector, are always needed when a special programme is being prepared.

The programmers in different radio stations always collaborated with various experts from others sectors in preparing special programmes. Ten programmers out of twelve interviewed said that, always, they did not get enough material for their work from the library of documents, thus, they had to go to search for relevant material in the documentation centres or special libraries of a particular sector or Ministry, depending on what one was preparing. If a programmer failed to get what he/she was after in these documentation centres/libraries, he/she would ask for assistance from relevant officials in that particular sector.

It was realized that, most of the personnel officers did not normally use the documentation centres/libraries. Out of four personnel officers interviewed, three of them claimed that they had circulars and other documents in their offices, and therefore, the documentation centres/libraries could not help them. The fourth one, at RTD main station, admitted that, he was going in the library of documents everyday for reading newspapers and sometimes for searching information for his duties. It was finally found that, there was only one user of documentation centres from the department of Administration in all institutions visited. Most of these personnel officers said that their daily work was to deal with files of employees, and

that most of the information they needed could be available within these files. They added that, sometimes they could consult circulars and other relevant documents available in their offices for special or complicated cases.

Experts in different departments interviewed, and others who responded to the questionnaire, all required information services provided by the information centres (libraries/documentation centres) in their institutions, in carrying out their duties. However, 60% of the respondents said that, the available information resources were inadequate for their needs. They added that, they normally used Libraries/Documentation Centres of their institutions, Foreign Cultural Centres, University Libraries, Public Libraries and also Special Libraries situated in various institutions/colleges and Ministries.

Most of the respondents said that, they had been going to these libraries/documentation centres outside their institutions to seek information for special purposes, such as: performing technical duties; preparation of programmes; preparation of interviews; research and operational duties.

Some of the mentioned factors regarded to be most important for one's requirements were: relevant information to the use of immediate needs; relevant information for developing a programme; timely information; reliable information; and information presented in a simple and direct form. The

respondents also expressed concern that, the type of information they required for their needs included: summarized information; full document; critical summary; abstracts; statistical; and information contained in books and journals. No body recommended full database or CD-ROM media because they did not know about it. With the computerized information support system, these are going to be among types of information they will require most.

5.4 NEED FOR COMPUTERIZED INFORMATION SUPPORT SYSTEM

All people interviewed in various departments at RTD, VZT, RVG, Radio One and "Tumaini" Radio, emphasized that Radio Broadcasting is an important agency for promoting development activities by facilitating increased communication and awareness in rural and urban areas between the country and other countries. They added that, increased awareness promotes responses from various social and economic groups leading to mobilization of resources for development; information on development opportunities through radio broadcasting stimulates the business community to respond to government incentives and policies, and thus, promote economic activity. The interviewees agreed that, the above aspects would be reached if the information systems in all radio stations are strengthened. The strength would come through having facilities, especially the computer. This facility would contribute a lot in the activity of capturing, storing, processing and dissemination of information required for radio services development.

Also, the need for having an effective and efficient information support system to cater for radio services development in Tanzania, has been confirmed by the results of questionnaire distributed to administrators, journalists, programmers, broadcasters, researchers and engineers/technicians, at all radio stations surveyed. The questionnaire had items to identify the nature of work of the respondent, the type of data/information needed, where such data/information has been obtained from, whether there is an information or documentation centre/library devoted for their work, and if there are any problems encountered as a result of deficiencies in information provision.

Out of 22 questionnaire distributed, only 12 were completed. The response showed that all 12 respondents needed computer-based information support system to avoid or to get rid of deficiencies, and thus, ease: preparations of radio programmes; operation of studio equipments and machines; research activity; and planning of radio services development. The summary of respondents from different radio stations surveyed about establishment of computer-based information support system is shown in table 4.

Table 4: Response about the establishment of the Computer-Based Information Support System in the Sector among the returned questionnaire.

ITEM	RADIO STATIONS							
	RTD (Dar)	RO	TR	VZT	RVG	RTD (Dodoma)	RTD (Arusha)	Total
Number of Questionnaire Distributed	9	2	2	2	2	3	2	22
Number of Questionnaire Completed	6	1	-	1	2	1	1	12
Percentage of Respondents	66.7	50	0	50	100	33.3	50	54.5
Positive Response	6	1	-	1	2	1	1	12

At RTD, the respondents recommended all four departments to have computers for the Local Area Network (LAN) activities. They also expressed that, through the computer, it will be easy to store, retrieve, process and disseminate news bulletins, local and foreign events, research reports, music statistics, previous programmes, subject matter statistics about programmes, and even theories of programme preparation. A journalist in the newsroom at RTD main station revealed that, copies of news bulletins were kept in the library of documents

for one month, then sent to the store. He complained that, "if you want the copy of news bulletin which was read two or three months ago, you have to go in the store to find it whereby you spend a lot of time". He emphasized that, "if such information was kept in the floppy or hard disc, it could be easy to retrieve it without moving from your desk".

The deficiencies mentioned, which could be avoided include: lack of up-to-date and reliable sources of data/information; delayed research reports; difficulty to get research report; unavailability of needed information to cater for various activities, for example, programme preparation; getting accurate information; lack of photocopy machines; few copies of documents; misplaced items/documents in the library; and that, the manual system was not efficient.

However, although every respondent preferred the computer-based information system, most of them admitted that they lack computer skills. Out of 12, only 4 were trained in the use of computer in word processing. They suggested that two experts with computer skills, that is, one engineer at RTD and another, a programmer at Radio One, could teach other experts locally in their institutions as well as other experts in other radio stations.

5.5 SURVEY OF INFORMATION CENTRES IN OTHER SUB-SECTORS

Seven Information Centres other than RTD's main station libraries, were selected for this study. All information centres provided services in the form of libraries and documentation centres. These are: two documentation centres at Radio One (RO) and "Tumaini" Radio(TR); and two libraries at Voice of Zanzibar Tanzania (VZT) and Radio Voice of Gospel (RVG) respectively. The other two libraries were at RTD's Dodoma and Arusha Booster Stations. The selection of these documentation centres/libraries was based on their being very instrumental to radio services development process in Tanzania. The services rendered by these documentation centres/libraries, the computer resources available, and the magnitude of their co-operation in data/information exchange and dissemination, with RTD and DIB, were assessed. Copies of the Questionnaire were sent to each of these sub-sectors (radio stations), and were supplemented by interview and on-site observations. The findings of the survey are presented in the following sub-sections.

5.5.1 RTD Booster Stations: Dodoma and Arusha

Arusha and Dodoma are the biggest transmission stations of RTD compared to other five transmission stations. These two were the first to be established and currently they have enough facilities capable for boosting RTD programmes, preparing programmes and broadcasting them. The transmission facilities

at Arusha and Dodoma radio booster stations are connected with other transmission facilities in all other booster stations and of course, connected with RTD main station in Dar es Salaam. At each radio booster station, there are programmers who are also broadcasters. They are also performing journalistic duties. There are engineers and/or technicians who are controlling technical section.

The information centres in these two radio booster stations are providing services in the form of libraries. These are one library in each station with two main sections. One section is dealing with printed materials, such as, books, magazines, journals, research reports, previous news bulletins and newspapers. The other section is for music tapes/discs and other tapes for recorded programmes or recorded events in the country. These libraries are not classified. All the materials in both sections in each library are arranged and shelved (with labels) according to the subject matter or field.

The available material seemed to be enough for users whose duties are limited compared to RTD main station. The person in charge of each library revealed that, the experts, mainly the programmers/broadcasters used the library when they were on the programme preparation exercise or when they were preparing their reports to be sent to Dar es Salaam. They claimed that the available materials were adequate for the users. These experts (programmers/broadcasters and engineers/technicians) were not available to be interviewed. By that time they were in different regions to gather information about election

campaigns for last year's Tanzania General Election, held in October, 1995.

At the time of the survey, there were plans to classify these libraries using known schemes, such as, Library of Congress (LC), Dewey Decimal Classification (DDC), Universal Decimal Classification (UDC), Colon Classification System (CCS), etc. The in charge of Dodoma library revealed that, he had received the guidelines of the plan from headquarters in Dar es Salaam and he was waiting for experts from Dar es Salaam for implementation. He repeated almost the same statement about developing the information centres of RTD given by the Controller of Programmes and Chief Librarian at RTD main station in Dar es Salaam (refer section 5.2.2.). The in charge of the library at Arusha station did not go in details, but only stated that, they wanted to expand and improve the services provided by his library.

It was revealed that, data and information resources were mainly through researches/surveys conducted time to time and from Tanzania News Agency (TNA) which has branches in all 25 regions of Tanzania.

In each of these two libraries: Arusha and Dodoma, there was one microcomputer, Epson model. These microcomputers were located in the offices of the in charge of the library. The main activities
utilized by these microcomputers are for Word Processing using Word Perfect 5.1 software.

5.5.2 Voice of Zanzibar Tanzania (VZT)

At Voice of Zanzibar Tanzania (VZT), the survey revealed that the information centre was providing the services in the form of a library. There were five workers performing different duties. Every duty was performed manually since the whole institution had no even a single computer. One section of this library is for printed material, such as, books, journals, research reports and newspapers. The other section is for music tapes/discs, programme tapes and recorded events.

The person in charge of this library explained that, the classification scheme used by this information centre was Universal Decimal Classification (UDC). However, no indexing was conducted. He added that, this library was linked to the Documentation Unit in the Ministry of Information and Broadcasting of the Zanzibar Government. It was revealed that, the data/information and views, which VZT received from listeners, were mainly useful to programming section, broadcasting section, technical section and also to decision makers.

Some of the shortcomings identified according to the existing manual information system, were that: the system was not efficient in storage, retrieval and management of information in general; the information retrieval exercise could not be fast since the files and catalogues are not arranged in such a way that they can be picked or seen easily upon demand; security of these files was also not guaranteed; data are not

obtained on time and information was unco-ordinated. These shortcomings were revealed regardless of the first statement from the library's in charge that his information centre was performing its duties well. However, the in charge of this library admitted the presence of the above mentioned shortcomings, and that, the establishment of the computer-based information support system would enable this information centre to overcome them.

5.5.3 Radio One (RO)

The Documentation Centre at Radio One (RO) was basically in its infancy. However, the plans envisaged to develop it, as explained by the person running it, were quite encouraging, if at all they would be implemented. Nevertheless, it appeared that these aspirations were just a broad goal, which had no clear strategies worked out of the implementation. No study had been taken at the time of the survey to try to understand the nature of the intended undertaking.

At the time of the survey, the information system at RO, still did not provide comprehensive services to radio services development decision makers and planners to support their various planning tasks. The survey revealed that, the coverage of data, and information generated, had not yet met the needs of radio services development decision makers, planners and researchers. This makes radio services development planning process (in this sub-sector) deficient, a situation which is prone to risky decision making.

All 3 experts working as both programmers and broadcasters interviewed, admitted that sometimes they were forced to perform their duties without adequate information base, as a result of a narrow coverage of information in the documentation centre. This tendency is prone to erroneous decision making which can do much harm instead of bringing the much needed development.

The documentation centre at Radio One is not a computer-based system. Moreover, there is not any computer facility in this small documentation centre. All activities are manually performed by one person. However, this radio station has two microcomputer: ATNT 486X, and Morse System Computer 486DX. These are stand alones, one being located in the Director's Office and the other was in the Chief Programmer's Office. Using Word Perfect 5.1, these computers are used for normal clerical duties.

5.5.4 "Tumaini" Radio (TR) (Radio of Hope)

Same as it was revealed at Radio One, The Documentation Centre at "Tumaini" Radio (TR) was in its infancy. This documentation centre is even smaller than that of Radio One; and it is the smallest and most unorganized than all documentation centres visited in the sector. This documentation centre was run by one person who seemed as if he was not sure of the type of documentation activities conducted, and the type of information services offered to the users. When asked who were the main information users according to the material available at that

time, the operator answered that any member of the staff was the user. However, she could not tell how frequently the users were visiting this documentation centre. At this small radio station situated in the Roman Catholic Church premises, there were 10 employees. These are: The Director, 6 experts (5 programmers/broadcasters and one technician), one documentalist, one driver and one sweeper/messenger.

It was revealed that, the material available were mainly religious books, journals, magazines and newspapers from various countries, especially East African countries: Tanzania, Kenya and Uganda, and European countries: Italy, France and Belgium.

It was known through the interview conducted that, these documents were mainly assisting the programmers and broadcasters in their daily duties of programming/broadcasting. Two people interviewed were both programmers and broadcasters. They said that most of the programmes are meant for Catholic Christians. They added that there are other few programmes of common concern to the society, such as, News Bulletin, Campaign For Better Health, Education For All, Newspapers' Weekly Review, Sports News, Human Rights, and Women And Children Development.

This institution has no computer facilities. The experts are using the typewriters to prepare the programmes. At the time of the survey, there was no plan to purchase the computer facilities due to lack of funds. What the institution was

intending to do according to one interviewee, was to expand its documentation centre so as to cater for all programmes preparation duties.

5.5.5 Radio Voice of Gospel (RVG)

This is the biggest private radio compared to Radio One and "Tumaini" Radio. As we have seen in chapter 4, section 4.2.2, Radio Voice of Gospel (RVG) was established before the other two private radios.

The information centre at RVG is providing services in the form of a library. This is a well organized and the biggest library in the sector. With well trained 5 librarians and 10 library assistants, it provides services to staff members as well as users from outside the institution who have acquired membership.

The Chief Librarian explained that his library offered various services to the users, such as, reference services, technical/specialized services, and common services, for example, lending library materials, photocopy and binding services.

The classification scheme used by this information system was Library of Congress (LC). Furthermore, this RVG library conducted indexing. That is, all library material were catalogued, by author, title and by subject. Every material: books, journals, research reports, theses, magazines, video

cassettes and music tapes/discs, was shelved according to its class number. There were seven sections, namely: Acquisitions, Cataloguing, Reference, General Collection, Periodicals, Circulation, and Photocopy and Binding.

It was identified that, this is a general library with abundant material of different fields for various users. However, it was noted that, material on religion and broadcasting (radio and television), were more than other fields/subjects. This showed that, the parts labelled "RELIGION" and another "BROADCASTING" were well furnished. This is due to the fact that, RVG is a religious institution under the Lutheran Church of Tanzania and its main activity is to provide radio services. The Chief Librarian said that, this library was accommodating various users within the institution and from other related or not related institutions, various government offices, parastatal organizations, NGOs, international organizations/agencies, secondary schools and colleges, and also individuals, such as, businessmen and farmers/peasants who were living nearby.

This RVG library is linked to another big information system - that is, the main library of Makumira Lutheran Theological College (MLTC), near Arusha town. MLTC is also an institution under the Lutheran Church which trains and provides certificates, diplomas and degrees to priests. These two information systems exchange data and information relevant to their users once in a week, and sometimes jointly, they conduct seminars and/or workshops.

Although RVG library is very big, well organized and also well furnished compared to other information centres in the sector, however, it is not a computer-based information system. The Chief Librarian appreciated the computerized information system that, it is better than non-computerized information system. She pointed out that, they lacked computer experts among themselves, at RVG. In addition, she said that, they had already sent advertisements in various local newspapers for the Systems Analyst/Designer who could assist them in the whole exercise of computerizing their library. At the time of the survey, RVG had not yet received the applications. This computerization exercise was planned to include the establishment of Local Area Network (LAN) and Wide Area Network (WAN) with the linked MLTC library; and provide Online Public Access Catalogue (OPAC) service.

Two experts (one programmer/broadcaster and another journalist) interviewed said that, they were satisfied by the services provided by the RVG library because there were adequate information resources for their duties. However, both preferred the computer-based information support system for better services, pointing out OPAC.

There are three microcomputers located in different sections of RVG library. The model of all these computers are IBM XT 286, and their printer in possession is Epson LQ-1170. These are stand alones and their applications had not extended to activities related to information storage and retrieval.

The software found in use at RVG library was Word Perfect 5.1 which was used only in word processing in the system.

5.5.6 Networking

Information Systems Networking is a relatively new concept in Tanzania arising from the need to come together to facilitate easy access of information, and also sharing of resources. The need for networking arises out of problems faced in information transfer due to rapid rate of growth in production and use of information.[2]

The information resources required in the generation, processing and dissemination of information, such as, skilled manpower, finance, and other materials, make it difficult for a single institution to generate or acquire alone, all the necessary information resources for various purposes by users. Networking facilitates sharing of resources which alleviates most of these problems. In addition, the developments in information technology provide possibilities to get fast access to a wide range of information resources.[3]

In the seven radio stations surveyed, all the computers are stand alones. However, all these sub-sectors expressed willingness to work for a networking mechanism. It was discovered that, most of the information centres personnel talking on this issue, had only a vague idea about networking. The importance of networking and the advantages occurring from it, seemed to be vaguely appreciated. Three respondents from

Radio Voice of Gospel, Radio One and RTD's Dodoma Booster Station, expressed their concern about data security and privacy. It was only after the discussions that they realized that more advantages are gained from networking systems.

At the time of the survey, there was no mechanism which effectively linked the information centres among themselves or with that of the Directorate of Information and Broadcasting (DIB). This hinders possibilities of smooth communication of new discoveries originating from research activities. The research findings become useful only when they are communicated to people who can put them into practice. It is this application of the findings which actually brings development to a nation.[4]

5.6 INFERENCES FROM THE SURVEY FINDINGS

The following are the inferences drawn from the findings of the survey carried out in different selected radio broadcasting institutions:

- The existing information support facilities to the institutions related to radio broadcasting, have very little contribution at present towards the development of radio services in Tanzania. This results from the missing link existing between these information centres and that of the Directorate of Information and Broadcasting (DIB). The survey conducted through the questionnaire and interviews, revealed

that, the research reports produced by some of these institutions, such as, RTD, RVG, etc., do not reach DIB information centre.

- The responses revealed that, up to the time of the survey, the information flow pattern between the information centres surveyed and that of DIB, was poor. Valuable information sources emanating from radio services findings remained on the shelves of the libraries/documentation centres without reaching the Directorate of Information and Broadcasting (the former Ministry of Information and Broadcasting) responsible for radio services development. Except for the annual reports, which have to be submitted at a given time by regulations, there is no stipulation arranged for research findings in the institutions dealing with radio services development, to be made available in the DIB. The research findings which could push forward radio services development, fail to contribute towards the end. It is a fact that, fast development in the developed countries has always depended much on research hence the term "Research and Development" (R & D).[5] In addition, it was identified that, the unsystematic ways of collecting data and information, and the absence of effective linking mechanism among information centres in the sector, added to the weakness of their development in providing services.

- The situation found in almost all radio stations, is that, the application of computer technology for the development of day to day activities, was still at the Basic Level. The characteristics of the Basic Level which is above Initial Level

are that: there is some understanding of computers among decision makers and experts. A few computer installations are found. Very few staff members are involved in computer operations and some with computer expertise are doing other activities manually. There is some education and training in computer technology in some radio stations, especially private ones. Generally, computers are used in basic operations, for example, clerical duties - in top offices; general data processing applications, such as, payroll, accounting - in accounts section, and stock control.[6]

Below, tables 5, 6 and 7, show the number , type, location and utilization of computers in the institutions (radio stations) surveyed.

Table 5: The Number and Types of Computers used in Different Radio Stations

TYPE	RADIO STATIONS							
	RTD Dsm	RO	TR	VZT	RVG	RTD Dodoma	RTD Arusha	Total Number
Main-Frame	-	-	-	-	-	-	-	0
Mini-Computer	-	-	-	-	1	-	-	1
Micro-computer	7	2	-	-	8	1	1	19
Total Number	7	2	0	0	9	1	1	20

Table 6: Location of Computers by Information Centres

LOCATION	RADIO STATIONS							
	RTD Dsm	RO	TR	VZT	RVG	RTD Dodoma	RTD Arusha	TOTAL
Location in the Library/ Documentation Centre	-	-	-	-	3	1	1	5
Location in the Parent Institution's Different Offices	7	2	-	-	6	-	-	15
Total Number	7	2	0	0	9	1	1	20

Table 7: Extent of Computer Utilization in the surveyed Institutions

ACTIVITY	RADIO STATIONS							
	RTD Dsm	RO	TR	VZT	RVG	RTD Dodoma	RTD Arusha	TOTAL
Word Processing	5	2	-	-	7	1	1	16
Database Management	-	-	-	-	-	-	-	0
Financial Management	1	-	-	-	1	-	-	2
Statistical Packages	-	-	-	-	-	-	-	0
Data Processing	1	-	-	-	1	-	-	2
Total	7	2	0	0	9	1	1	20

- Almost all radio stations worked in isolation except RTD's booster stations which communicate with RTD main station through telephone, telex and fax. The information centres supporting these institutions, especially private sector, work in accordance with stipulated organizational framework. There is very little

connection with information centres outside the institutional boundaries. This is not helpful in resource sharing efforts.

- Information needs are varied and complex. No one information centre, however powerful, can serve all the users' needs.[7] A resource sharing information system in radio services, is thought to be very important to meet the various information needs for radio services development exercise in the country.

- The available manpower in the libraries/documentation centres is inadequate in most of these information centres surveyed. Currently, there are less than ten qualified librarians/documentalists in the whole sector. Basing on the mentioned plans which have been put forward to strengthen the information centres in the sector, more qualified manpower is required.

- Most of the libraries/documentation centres in this radio broadcasting sector have experienced budgetary constraints. This limits their capacities to meet the needs of users. The over-dependence on donor agencies for their development have not helped for a speedy progress of these information centres. The DIB needs to include the developmental plans of the libraries/documentation centres in its budget. It was revealed that, the DIB's broadcasting policy acknowledges the importance if information towards sustainable radio services development.[7] This is a good reason for the DIB to spend as much as possible to step up the radio services development endeavour.

- Although the use of information centres is appreciated in the radio broadcasting sector, some users were unanimous to point out that, the services provided by the libraries/documentation centres in their institutions, were inadequate to meet their needs. This inadequacy has contributed to provision of out of date and/or wrong data/information; unnecessary repetition of same programmes due to long preparation of the new ones; delaying and shifting of programmes unnecessarily; poor information coverage and incomplete programmes aired. These shortcomings have been caused by lack of reliably, timely, accurate, relevant and adequate information.

- There have been an exercise of exchange of programmes, especially news bulletins, special programmes and advertisements, between RTD and VZT for about 20 years. However, it was noted that, this exercise has not been systematically implemented due to inefficient transmission facilities, unreliable electricity supply in the country, delay in preparation of those programmes, and the interference of politicians to radio authorities forcing them to air major political event(s), for example, speech(es), which would be taking place by that time.

- The absence of coherent national information policy for information systems and services, makes the information acquisition, processing and handling to be done in isolation, without taking into consideration that, they are a subsystem of

the national information system supposed to contribute to the country's overall economic and social development. This problem has even resulted in a random acquisition of computer hardware and software to a level whereby there are numerous different brands. This can cause problems in networking efforts because of compatibility and protocol difficulties. At the moment, a draft proposal on national information policy on information systems and services, worked out by Sekimang'a, former SISA student, in 1992, has not yet been adopted by the government.

The shortcomings discovered in this survey need to be rectified if the whole question of radio services development is to be successful. As we have said earlier, all experts and administrators in the sector need adequate, accurate and timely information to discharge their duties effectively. Otherwise the planning, decision making or research undertakings may lead to sheer wastage of scarce financial and other material resources, without achieving any reasonable development.

Information is a valuable resource which, in order to take full advantage of it, requires a properly structured information system to handle and disseminate it effectively. Effective handling and dissemination of information will contribute to faster development of the radio broadcasting sector.

It is by taking these factors into consideration, that, the next chapter proposes a Computer-Based Information Support System for Radio Services (ISSRS) in Tanzania. The proposed system suggests some approaches thought to be a remedy for the

existing shortcomings in the present information centres for the radio broadcasting sector.

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CHAPTER SIX

THE PROPOSED INFORMATION SUPPORT SYSTEM FOR RADIO SERVICES IN TANZANIA (ISSRS)

6.1 INTRODUCTION

Data processing and information handling, as a major social activity, has been rapidly changing due to the existing information technologies that are helpful tools in managing the huge amount of data available in today's society. That is, the increasingly growing amount of data available in the modern society made the challenge in the data processing environment more complex.[1] The on-going technological advancement in computer and related technologies, have continued to change the data processing and information handling in both business and service sectors including radio broadcasting sector.

Shortcomings of the current information support for the radio services development in Tanzania have been discussed in chapter 5. The situation presented in the analysis in chapter 5 calls for efforts to strengthen this information system so that it can meet the requirements of planners, decision makers, executives and experts for sustainable development in the radio broadcasting sector.

An information system should meet needs of the organization it serves, and applications should meet the needs of its users. The requirements of the information system are therefore

determined by the strategies, goals, procedures, and behaviour of individuals within the organization acting individually or collectively.[2] According to the survey of this study, the majority of respondents stated clearly that all information related problems affecting the radio services development now, could be solved by establishing information support system, which can link the Directorate of Information and Broadcasting (DIB) with all radio stations and also other institutions related to radio services development, for example, Tanzania News Agency (TNA).

It is apparent that, redesigning and modification of the existing information support system, is the only rational approach to arrest the identified shortcomings.[3] Information is viewed as a resource much like land, labour, and capital. It is not a free commodity. It must be obtained, processed, stored, retrieved, manipulated and analyzed, and then distributed. An organization with a well designed information system, will generally have a competitive advantage over organizations with poorer systems.[4]

An underlying point here is that, the information support system proposed in this study, is to hinge on the premises that a well designed information system adds value to the organization. The proposed information support system focuses at alleviating the information related stumbling-blocks currently affecting the effective development of radio services in Tanzania.

6.2 OBJECTIVES

Information is a vital ingredient for the operations and management of any organization. The scope of an information system in an organization is limited by the data that can be obtained, the cost of obtaining, processing and storing the data, the methods of communication, the value of information to the users, and the capability of humans to act on the information.[5]

Having identified that the existing information support services related to radio services development in Tanzania are weak; and that the weakness of these information support services have led to a slow process of radio services development, the design of the proposed information system intends to rectify these shortcomings, to perfect the radio services development activities.

The objectives of the computer-based information support system for radio services are to assist the Tanzania Radio Broadcasting System in attaining its goals. To achieve these goals, the following undertakings are expected to be derived from the new system, thus:

(i). To facilitate the selection, processing and communication of radio services development information from the point of generation and availability to their potential users at all levels;

(ii). To ensure that the information made available is precise, exhaustive and accessible with minimum delay, presented in a manner more convenient to the respective users and the service is provided at the minimum cost;

(iii).To strengthen the link between existing information centres in all radio stations with that of the Directorate of Information and Broadcasting (DIB).

(iv). To enhance the capacity of the old radio services information centres by introducing a computer-based information support system;

(v). To create and/or design different referral as well as specialized databases. Referral (or integrated) databases will include: bibliographic records, profiles of experts, institutions, information systems, and profiles of projects. Specialized databases being designed are: programmes, audience and equipment. These databases aim at meeting the information needs of the administrators and experts engaged in radio services development as identified in the survey. The prototype databases are going to be designed in a way commensurate with the needs of the identified radio services development users.

6.3 STRUCTURE OF THE PROPOSED ISSRS

The proposed new information support system to be based in the DIB, is computer-based. The computer-based information system uses computers to store data about organizations and make these data available to the organization's personnel.[6]

The decision to opt for a computer-based information system lies on the fact that the computer is the most powerful tool for the fast handling of large quantities of data/information. Whatever the field, the computerized information service will more and more become a tool for those working with new configurations of knowledge in the future.[7] The computer provides the capability for doing highly complex searches organized on any of the fields in a record and massive quantities of data. This applies to whatever type of information which is made machine readable whether bibliographic, citations, summary statistics, raw numeral data, or full text.[8]

In addition to the computerized information support system in the DIB, there will be a back-up in the form of a documentation centre which currently even the manual information centre is unorganized. Hard copies of various reports from institutions engaged in radio services development in the country, plus other documents from other data sources outside the country, will be kept there and made available to users, besides the computerized data and information.

Below, figures 9 and 10 show the organizational structure of the radio broadcasting sector incorporating ISSRS, and the proposed structure of the ISSRS itself, respectively.

Figure 9: Organizational Structure of the Radio Broadcasting Sector in Tanzania.

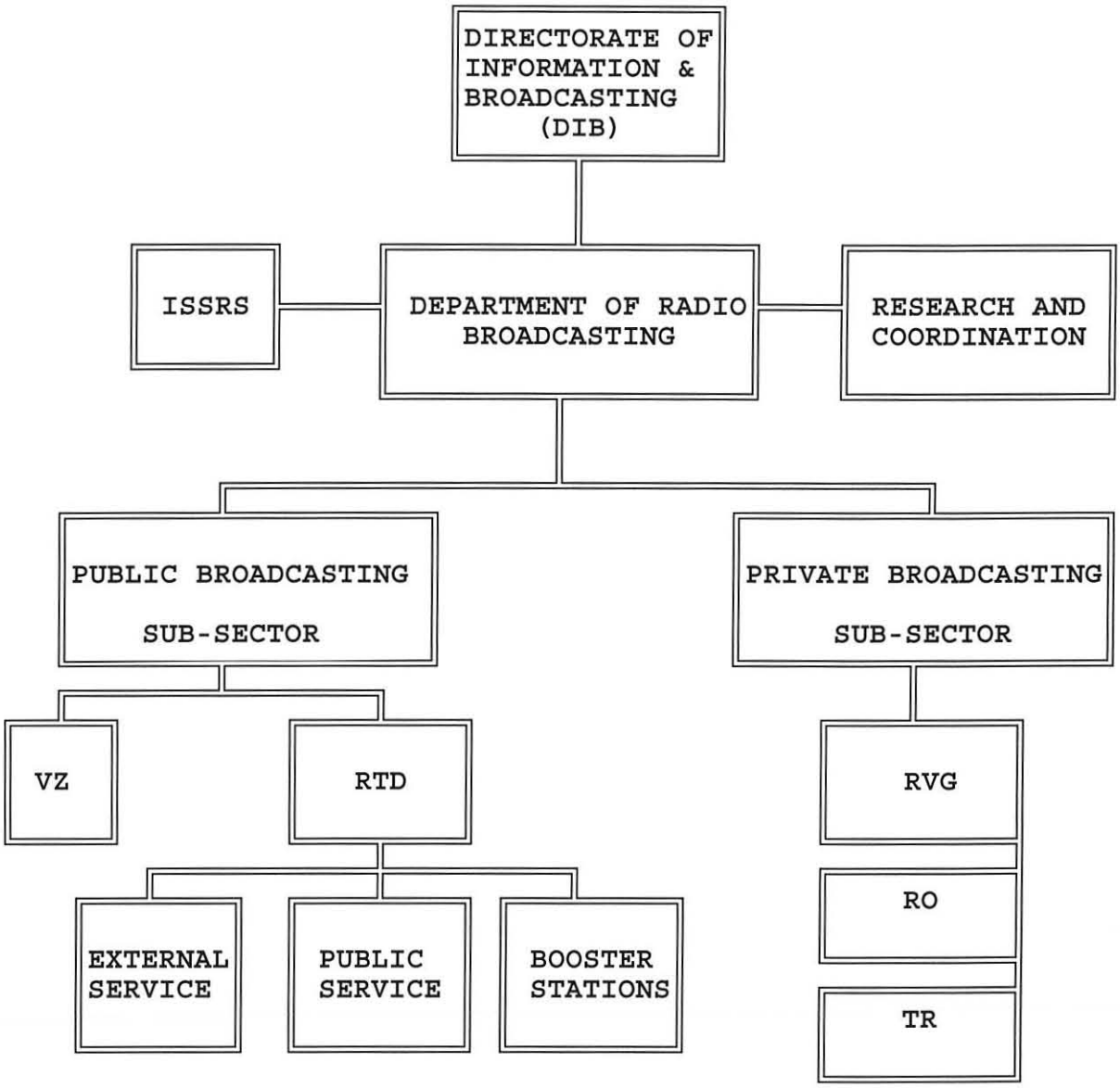
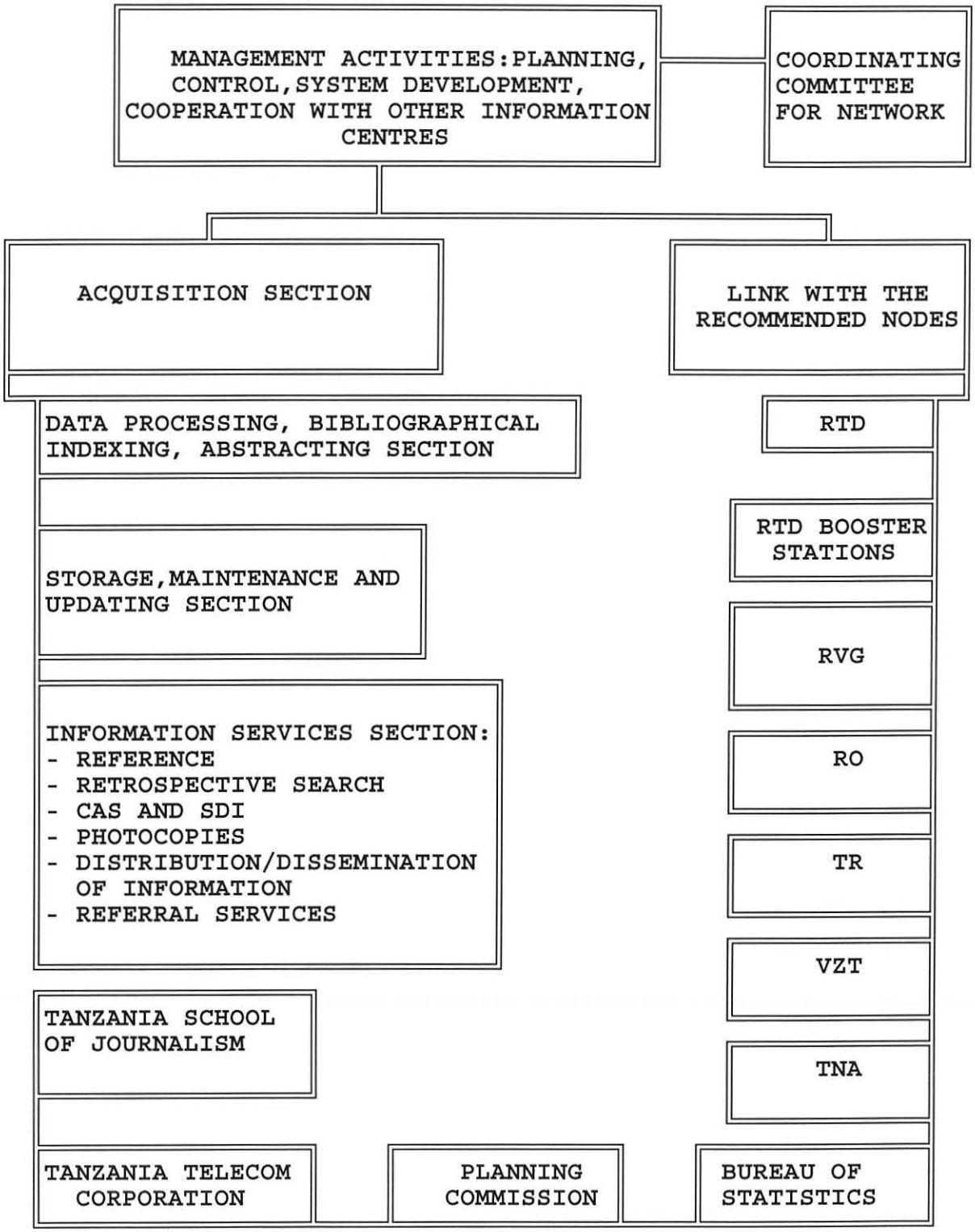


Figure 10: Organizational Structure of the Computer-Based Information Support System for Radio Services Development in Tanzania (ISSRS).



This information centre in the DIB is going to specialize in the collection of information about broadcasting generally. The following activities are expected to be carried out by the new system:

- it will reduce duplication of efforts among different radio stations in the country;
- it is going to support tight managerial control since material and human resources of such a system are to be concentrated in a specific central area; and
- it will simplify the protection of privacy and may limit access to secured information.

An information system to support radio services development should be compatible with the current administrative structure of the radio broadcasting sector. This computer-based information support system (ISSRS) will have links with other information centres to facilitate smooth and effective flow of information to it. The linking mechanism will be through the nodes to be established for that case. These nodes will be installed in the functional radio services development institutions, that is, all radio stations and RTD's booster stations. Other nodes will be in institutions that assist radio services development activities in one way or another. These institutions are: Tanzania News Agency, Tanzania Telecommunications Corporation, Bureau of Statistics, Planning Commission and Tanzania School of Journalism.

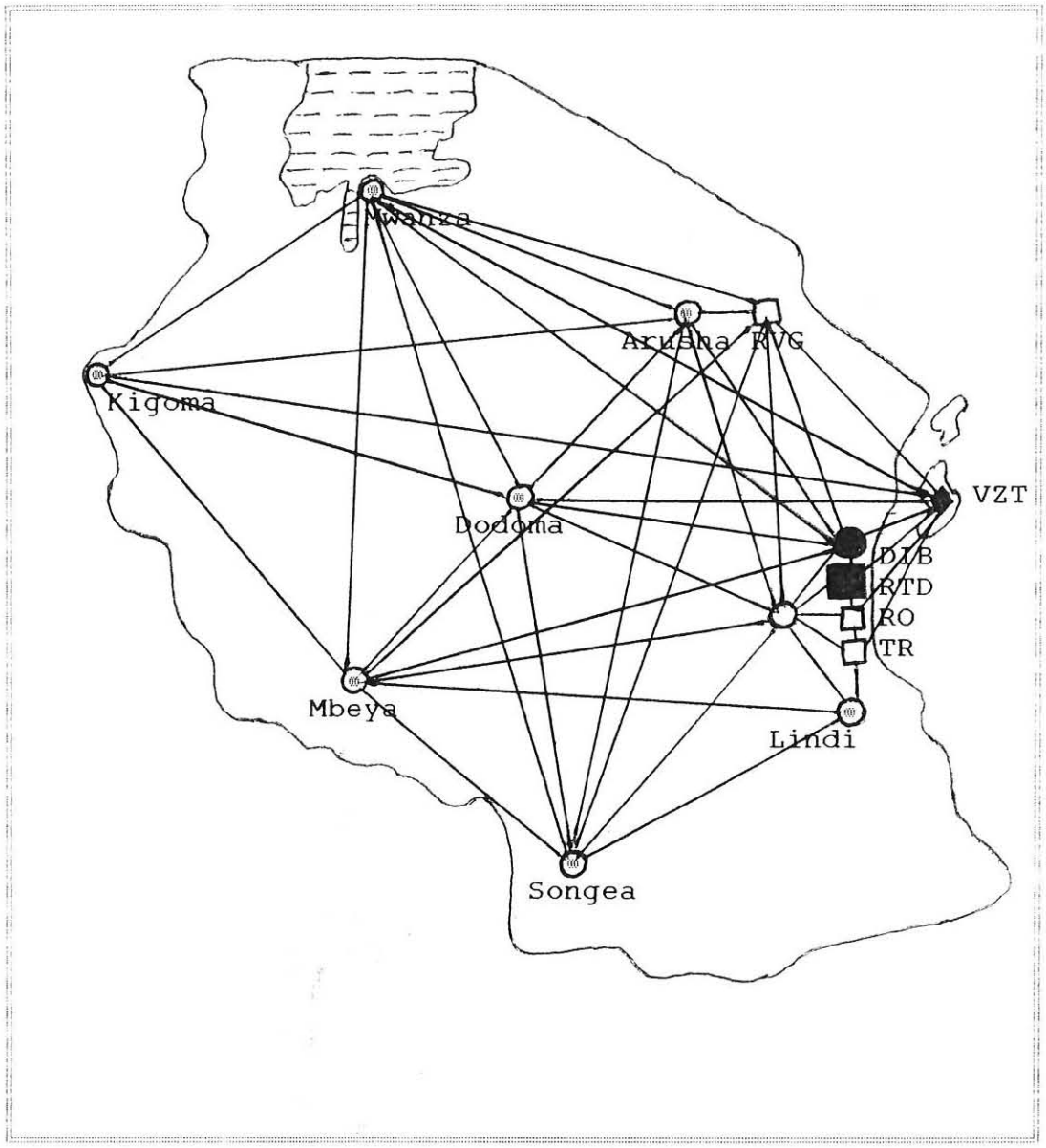
This proposed ISSRS is designed to co-ordinate existing information centres in all these institutions earmarked for

better performance. These institutions are aware of radio broadcasting goals and vital role the radio plays within the national plan processes. Therefore, the need for a link and co-ordination of information services which are related to radio services development through the proposed nodes, arise from the quest to rectify the shortcomings discovered during this study.

The following figure (figure 11), shows how the nodes (information centres) are going to be connected to one another and to the central node in the DIB in Dar es Salaam.

Figure 11: The ISSRS Networking Structure of Nodes in Different places of Tanzania under the Central Node in D'Salaam.

TANZANIA



Key:

- Directorate of Information and Broadcasting (DIB).
- Radio Tanzania Dar es Salaam (RTD) Main Station.
- Voice of Zanzibar Tanzania (VZT).
- RTD Booster Stations.
- Private Radio Stations.
- Other related Institutions to Radio Services Development.

6.4 INFORMATION FUNCTIONS, ACTIVITIES AND SERVICES

6.4.1 Information Retrieval

6.4.1.1 Interactive Search

Computer-based information systems increasingly involve online interaction between the user and machine.[10] The interface consist of screens, keyboards, languages, etc., as means by which the information searcher can exchange inputs and outputs with the computer. The proposed ISSRS is to have this service. Section 6.10 of this chapter exemplifies the demonstration on procedures that can be carried out step by step for retrieving. This illustrates how a user can conduct both the interactive and retrospective search of the databases.

6.4.1.2 Retrospective Search

Retrospective Search services are going to be rendered also, by the proposed ISSRS. Using the computer, the user can search for the information in the databases to meet his/her requirements. The search in this case, may be by author, subject or by title.

6.4.1.3 Reference Services

Reference Services will be discharged also by the proposed ISSRS. Reference services add value to the information system because they help users in shaping correctly their queries. The best sources to get the information they may be looking for, are normally communicated to them depending on how the user intends to utilize that information. The reference services help users to know which catalogues, directories, files, secondary publications or databases to consult so as to get the required information to solve a specific problem. This is expected to be quite useful to the users developing radio services in the DIB, in all radio stations, or other related institutions.

6.4.2.4 Referral Services

Referral Services are among the functions and activities which the proposed ISSRS is going to discharge. Referral services do not normally, provide the user with the document or the actual information required by the user, but refers the user to the relevant sources where he/she can get the required data or information. The database storing records such as research reports, profiles of projects, experts, institutions and information systems, are going to be helpful in rendering this service. The experts in the radio broadcasting sector, are expected to benefit by this service because they will be directed to the sources, whether documentary, institutional or

personal skills to do consultations and solve whatever problems they experience in radio services development activities.

6.4.2 Current Awareness Services (CAS)

A Current Awareness Services (CAS), is an attempt to try and find solution to some of the problems raised above. It is a system for notifying a user of an information service on a periodic basic of acquisition of information which should be of interest to the user or group of users.[11] This is expected to reform the services of the old system by breaking away from the traditional or passive approach ("wait for the user to come for it"), by affectively getting involved in taking the information to them (users) at periodic intervals - every week, every two weeks, every month, etc.

CAS is a modern services which aims at improving the exploration of documentation centre/library materials and giving individualized services to the experts.[12]

The Current Awareness Services (CAS) may take the form of Selective Dissemination of Information (SDI), preparing of bulletins, indexing and abstract services, and accessions lists, of the new additions in the documentation centre/library collections, to information users. Another form is for the documentation centre/library to maintain a collection of cuttings from newspapers and journals and a system for recording or ensuring access to current affairs recordings from radio broadcasts.

For example, at RTD main station, CAS may be provided by the Current Affairs Section in the department of News and Current Affairs (NCA) since this section facilitates the circulation of information.

Instead of using photocopying to produce copies for circulation, the method which has been delaying the service (that is, circulation of information), the information is going to be circulated through the computer-network. All the current materials received in the documentation centre/library for the users to browse, can be circulated using the computer (network) operating in LAN and WAN environments.

6.4.3 Selective Dissemination of Information (SDI)

Selective Dissemination of Information (SDI) is another service which is going to be introduced with the ISSRS. This is a highly refined and personalized form of Current Awareness Services (CAS). The system assumes that, the information manager knows and fully understands the user's information requirements, needs and demands; and the latter has full confidence in the information manager to the extent that, he/she is prepared to delegate information searching to him/her.[13] The essential elements to be incorporated in the SDI include:

- -selection and acquiring documents for input;
- -indexing of incoming documents;
- -users needs identification and selection;
- -matching of documents against profiles;

-production of outputs (abstracts, full texts, citation, etc);

-transmission of output to users; and

-evaluation and modification of the SDI system.

6.4.4 Networking

Resource sharing represents advanced levels of formal co-operation which utilize computer networks and telecommunication technology. In addition, resource sharing implies a partnership in which each member of the network has something useful to contribute willingly to others.[14]

It has been realized that, a network is formed by diverse autonomous information sources which are linked in a formal relationship to provide increased access to materials and services from other information centres. It provides a conducive environment in which the information professionals, such as, information scientists, librarians, documentalists, etc., can exchange ideas and share resources. The network therefore, provides the organizational structure which facilitates resource sharing.[15]

The ways in which optimum co-operation between the information centres engaged in radio services development and others which are related, and the ISSRS, will be based on Wesley's principles[16] which, among other things recommend that:

(i). In the information resource sharing endeavour, each unit should have something useful to give to others. It is not "I join so that I get, but I give so that I receive".

(ii). A two-way co-operation model will be used to ensure that, there is a shared responsibility where each centre contribute to the network.

(iii).An agreement on objectives of the network and the joint action necessary to achieve those objectives, is to be worked out.

(iv). A network co-ordinating committee should be formed to prepare a written work plan and getting their commitment for its implementation. This is meant to enhance effective co-operation between information centres and the ISSRS.

(v). The resource sharing shall aim at securing adequate resources and efficient communication.

(vi). There shall be a provision for legal responsibility for the realization of the network objectives to develop the radio broadcasting sector.

(vii). Training activities will be required to ensure the successful implementation of network programmes and procedures adopted for the network.

(viii) Efforts will be made to ensure commitment to network standards, procedures, policies and activities.

(ix). To ensure that every participant (information centre) understands that the key of the success of the network lies in the participants themselves, in the support they provide, in their willingness to surrender a certain amount of self-sufficiency, and in their determination to make the programme succeed.

6.5 PROPOSED DATABASES

A database is a mechanized, formally defined, centrally controlled collection of data in an organization.[17] The database concept has been highly facilitated by the development of computers, and other information processing and communication technology, especially the development of database management systems (DBMS). A DBMS is a software system which performs the functions of defining, creating, revising, and controlling the database. It provides facilities for retrieving data, generating reports, revising data definitions, updating data, and building applications. Because many end-users and a variety of application programmes can access the database, it is

desirable to exercise control over the database, by having a database manager.[18]

The database approach has been recommended due to the economy, and convenience of use. This is due to the basic characteristics of DBMS whose main objectives are: availability of data for use by applications and queries; sharing of data by all application programmes; evolving of data - that is, the data can evolve as application usage and query needs evolve. DBMS provide data independence where the users of the database establish their view of the data and structure without regard to the actual physical storage of the data. Another major characteristic is data integrity. The database establishes a uniformity high level of consistency with validation rules usually applied by the database management system.

Several DBMS have been developed for different uses. Some are good at statistical manipulation, others at spreadsheet, others at payroll and personnel management, etc. Some are good at bibliographic and information (text) handling, providing high retrieval capacity. Such a DBMS is CDS/ISIS which is an information storage and retrieval software developed by UNESCO.

CDS/ISIS can work on microcomputers, thus, very suitable for developing countries especially Africa, where many information centres are small and resources are limited. Due to this flexible feature and free availability to non-profit making institutions, as it is Radio Broadcasting Sector, it is almost the prescription to developing countries like Tanzania. In

Tanzania, CDS/ISIS is distributed by COSTECH, and several information personnel in the country have undergone courses on its use. For these reasons, it is recommended for the creation of databases to enhance the information base of the ISSRS network.

It is impossible to fix a number of databases to be maintained by ISSRS. This is because databases evolve as queries and requests for data and information evolve.[19] Nevertheless, in order to provide successfully some of the services discussed in the preceding sections, there is need for development of databases. For this case, two kinds of prototype databases have been created using Micro CDS/ISIS version 3.0. These two kinds of prototype databases are: the Integrated (Referral) databases and the Specialized databases. It is hoped that, the prototype databases created can be adapted and expanded by ISSRS in the process of satisfying the information requirements of users. Obviously this will take place after getting the approval by the Tanzania government for implementation.

6.5.1 Integrated Databases

The integrated databases are referral databases which consist of profiles of experts, institutions, projects, bibliographic and information systems. A sample output of records of the databases is shown in the following sections corresponding to them.

6.5.1.1 Bibliographic Database

Such a database is developed with the help of standard bibliographic tools, such as, AARC2 codes or manuals, ISBD and CCF formats, in order to allow for standardization in terms of storage and retrieval, and more importantly information exchange. The items recorded are bibliographic descriptions of documentary sources of information; the descriptive elements, such as, name of the author, title of the named document, publisher, date of publication, etc. These elements conform to the descriptions of accepted cataloguing codes like that of AARC2.

The bibliographic records which consists of bibliographic descriptions document on radio broadcasting, are meant to help the users concerned with radio services development to know which sources to pick for the problem they want to solve in the process of developing radio services. The bibliographic database would refer the radio services planners, decision makers and experts to documentary sources existing in documentation centres/libraries in the sector, and also in other information centres in the country. This prototype integrated database has been named 'RADIO'. Figure 11 shows a sample record of the bibliographic database.

Figure 12: Sample of Bibliographic Record

* * * BIBLIOGRAPHIC RECORD * * *

LANGUAGE OF TEXT:	English.
TITLE:	Broadcasting Network in the United Republic of Tanzania.
AUTHOR:	TOSHIBA Corporation.
AFFILIATION:	Directorate of Information and Broadcasting (DIB).
PUBLISHER:	TOSHIBA Corporation, Dar es Salaam.
CALL NUMBER:	TK5101 .C6588 .5 1987
NUMBER OF COPIES:	5.
LOCATION:	RTD, Library of Documents, Dar es Salaam and Dodoma.
ABSTRACT:	This pamphlet is the "Approval Drawing with illustrated details on the Development Project For Medium Wave Radio Broadcasting Network in Tanzania (Dodoma Station), volumes I and II.

* * * * * * * * * *

6.5.1.2 Profiles of Institutions

To enhance the information support system for radio services development in Tanzania, a database for profiles of institutions will be useful. Planners, decision makers and experts in this sector may want to know which institutions are involved directly in which type of radio services, and also which institutions are assisting in one way or another the whole exercise of radio services development in the country. In this regard, profiles of institutions will show which of these institutions are and help radio services developers get information desired from time to time.

The database may be quite useful in the process of allocating resources to institutions. The institutions dealing with radio services development will be known and supported accordingly.

This database will also be helpful in overall planning and distributing responsibilities among institutions related to radio services development. Figure 13 shows a sample record of the profile of institution created within the integrated 'RADIO' database.

Figure 13: Profile of Institution

* * * PROFILE OF INSTITUTION * * *	
NAME OF INSTITUTION:	Tanzania School of Journalism.
DISCIPLINE:	Journalism.
LOCATION:	Dar es Salaam.
YEAR OF ESTABLISHMENT:	1970.
NUMBER OF STAFF:	19 academicians; 14 supporting staff.
TYPE OF INSTITUTION:	Academic; Research Centre.
OBJECTIVES:	Producing Journalists to cater for various mass media and related institutions; producing and distributing research reports.
WORKING LANGUAGE(S):	Swahili; English.
PARENT ORGANIZATION:	Directorate of Information and Broadcasting.
GEOGRAPHICAL COVERAGE:	Tanzania; East and Central Africa.
DESCRIPTORS:	Journalism.
* * * * * * * * * *	

6.5.1.3 Profile of Experts

The prototype integrated database titled 'RADIO' incorporates some sample records of experts in the field of radio broadcasting in Tanzania. The objective of creating the profiles of experts database, is to have a repository of resourceful persons in this field of radio broadcasting in the

country. This will indicate data of important intellectuals/experts in radio broadcasting, that is, programmers, broadcasters, engineers/technicians and researchers who can be consulted by decision makers and planners for important information to enhance radio services development process.

Experts are one of the main sources of information which complement the information available in the form of documents or databases. The profiles of experts database are very useful when the radio services development projects are thought of being established, for example, establishment of new radio booster station, or establishment of Medium/Shortwave Radio Broadcasting Network, etc. For many years, Tanzania has relied on external experts in the execution of radio broadcasting projects, especially in engineering department, because of little information on the available local experts. Most of these foreign experts tend to be less informed on the social and environmental aspects of the country, causing the projects they supervise to fail. For example, the project of establishing Commercial Services For RTD at Kunduchi in Dar es Salaam, has taken more than ten years without getting completed.

The referral database of experts is going to help the government to try to check within the list of available local experts before turning their eyes to external experts. The database is to indicate the number of experts available, their areas of interest or specialization and the institutions they

are attached. This has also an implication to the education and development of experts in the radio services development related subjects. Chapter 14 shows a sample record of the profile of expert database.

Figure 14: Profile of Expert

* * * PROFILE OF EXPERT * * *	
NAME OF A PERSON:	Tesha, Jacob.
SEX:	Male.
QUALIFICATION:	Diploma in Mass Communication, (Cairo) 1980; B.A. (Political Science: Public Administration and International Relations (University of Dar es Salaam) 1993; Post Graduate Diploma in Mass Media: Broadcasting (Syracuse University) 1994.
DISCIPLINE:	Broadcasting; Political Science.
CURRENT EMPLOYER:	Radio Tanzania Dar es Salaam (RTD).
TITLE OF POST:	Programme Organizer.
AFFILIATION:	Directorate of Information and Broadcasting.
* * * * * * * * * *	

6.5.1.4 Profiles of Projects

The profiles of projects created within the prototype integrated database 'RADIO' are intended to help the radio

services development planners, decision makers, executives and researchers know the on-going projects, how they are being implemented, and the problems or progress experienced in undertaking them.

In Tanzania, like in many other developing countries, most of the projects in different sectors, are and have been carried out with little relevance to the nation's priority needs. Moreover, there have been cases of duplication of projects, a practice which results into wastage of the scarce resources in the country. The project database can minimize this because the data can be consulted to check the projects currently in operation in the sector, before embarking on a new project. Figure 15 shows a sample of the profile of project database.

Figure 15: Profile of Project

* * * PROFILE OF PROJECT * * *

TITLE:	Medium Wave Radio Broadcasting Network in Tanzania (Dodoma Station).
PRINCIPAL OFFICER:	Kapinga, Betram Matei (Project Engineer).
PERFORMING INSTITUTION:	Radio Tanzania Dar es Salaam (RTD).
TYPE OF INSTITUTION:	Parastatal (Services/Commercial).
ADDRESS:	P.O. BOX 9191, Dar es Salaam, Tanzania.
LANGUAGE(S) OF PROJECT:	Swahili, English.
LOCATION:	Dodoma.
STARTING DATE:	03 - 09 - 1993.
DURATION:	4 years (1993 - 1997).
CURRENT STATUS:	On going.
DESCRIPTOR:	Radio Line Communication, Broadcasting Network.
GEOGRAPHICAL AREA:	Tanzania, East Africa.
DISCIPLINE:	Radio Broadcasting.
TYPE OF RESEARCH:	Applied (i.e. practical).
OBJECTIVE:	Development of Medium Wave Radio Broadcasting Network for Strengthening Communication in all parts of the Country.

* * * * * * * * * *

6.5.1.5 Profiles of Information Systems

Information Systems related to radio services development are valuable repository of data and information generated by them as they discharge their duties. A profile of these information systems located in different institutions would help radio services developers to know which other systems could furnish them with required information not found in the information system they use at that time. Figure 16 shows a sample record of the profile of Information Systems.

Figure 16: Profile of Information System

* * * PROFILE OF INFORMATION SYSTEM * * *	
NAME OF INFORMATION SYSTEM:	Tanzania News Agency Documentation Centre.
PRINCIPAL OFFICER:	Maganga, John J.
PARENT ORGANIZATION:	Tanzania News Agency.
TYPE OF INSTITUTION:	Parastatal.
LOCATION:	Dar es Salaam.
WORKING LANGUAGE(S):	Swahili, English.
SERVICES OFFERED:	SDI, CAS, INDEXING, REFERRAL, ABSTRACTING.
GEOGRAPHICAL AREA:	Tanzania.
DATE OF ESTABLISHMENT:	07 - 01 - 1976.
PERSONNEL:	Information Officers, Researchers.
ACTIVITIES:	Gathering and Distribution of Information.
PERSON ENTERED DATA:	Kabalimu, J. M.
* * * * * * * * * *	

6.5.2 Specialized Databases

Specialized databases of the profiles of core concepts are becoming increasingly the basis for knowledge based systems, expert systems, etc., and for generating value-added products and services, especially at the institutional level.[20]

A specialized database normally provides information about an 'object' to meet the needs of the specialized user group for a particular purpose.[21] At a given time, an end-user is usually interested in selected attributes of the object, with a view to manipulating, modifying or using information for decision-making or problem-solving. Such databases can be home-grown on microcomputers to meet the needs of specialized user groups and can effectively supplement or be integrated with conventional bibliographic and referral type of database and services.[22]

Three specialized prototype databases have been created in this study. The creation or design of the three specialized databases is based on the findings of an analysis of radio services developers' information needs. This is due to close interaction between the researcher and the expected users. Therefore, decision on objects, fields, and data elements rest with the users' information needs so as to facilitate the possibility of retrieving information pertinent to their needs. This would help in identification of concepts to be indexed and arrangement of the data in the output from the databases. These three specialized prototype databases created are: 'PROGRAMME', 'AUDIENCE' and 'EQUIPMENT'.

6.5.2.1 Programme Database

The 'PROGRAMME' database is going to focus on the development of various types of programmes. This means, the programmers will be helped by this 'PROGRAMME' database when they are modifying the current programmes, or when drawing experiences of particular programmes from other countries. Its main concern is to record some trends in radio broadcasting policies, objectives, current situations, forecasts, experiences including longtime renewable programmes, deleted programmes and the newly introduced programmes in the process of radio services development. Figure 17 shows a sample record of the 'PROGRAMME' database.

Figure 17: Sample of PROGRAMME Database Record

* * * PROGRAMME RECORD * * *

PROGRAMMING INSTITUTION:	Tanzania Insurance Corporation(TIC) and RTD.
TYPE OF PROGRAMME:	Educational.
TOPIC/TITLE:	Types of Insurance.
OBJECTIVE:	Insurance against various damages.
PROGRAMMER(S):	Kihiyo, J. (TIC) and Kambona, A. (RTD).
DATE OF PREPARATION:	01 - 10 - 1988.
DAY OF BROADCASTING:	Every Tuesday.
REPETITION:	Every Saturday.
TIME OF BROADCASTING:	8.00 pm (local time).
DURATION:	30 minutes.
LANGUAGE:	Swahili.
SOURCE OF INFORMATION:	Tanzania Insurance Corporation and other Insurance Agencies.
ABSTRACT:	This programme explains how the contract is entered between Tanzania Insurance Corporation and its Policy Holders, and tells what compensations are provided after the damage/loss/ sickness/death,etc.
FORECAST:	To continue educating people so as the majority of Tanzanians understand the policy and the importance of insurance, and thus, join/insure themselves.

* * * * * * * * * *

6.5.2.2 Audience Database

The 'AUDIENCE' Database is meant to enable planners and decision makers to have the reports on the listeners of different places and categories in the country. This include the listeners' views, opinions, requirements, demands and also their habit or behaviour in listening the radio. The planners and decision makers will use the feedback through the reports available in the database to modify the current programmes, delete unimportant ones, and also introduce new programmes in order to cater for the listeners' requirements. This 'AUDIENCE' database will contribute to the development of radio services strategies to be planned or decided by the radio broadcasting developers.

One of the aspects which determine the programme management is the audience statistics, that is, survey of the audience in the market. Therefore, the assessment of size, nature, categories and tastes of the audience for the purpose of providing better radio services is essential. Figure 18 shows a sample record of the 'AUDIENCE' database.

Figure 18: Sample of AUDIENCE Database Record

* * * AUDIENCE RECORD * * *

REGION:	Shinyanga.
PLACE:	Mwadui Mines.
AUDIENCE:	Diamond Miners.
MAIN PROGRAMME PREFERENCES:	Music Variety, News Bulletins, Sports, Local Events, and Interviews at Working Places.
REASONS GIVEN:	To know what is taking place in Tanzania and outside ; To get entertainment.
LANGUAGE:	Swahili.
PERCENTAGE OF LISTENERS:	75%
GENERAL REQUIREMENTS:	Radio Broadcasters are needed to conduct Interviews with Workers at Mwadui Mines.
LEVEL OF EDUCATION:	85% of miners are primary school leavers.
QUESTIONNAIRE COMPLETED:	55% of all respondents.
KIND OF ADVERTISEMENT NEEDED:	None.
EXPERIENCED PROBLEMS:	Only RTD and RVG are audible; VZT, RO and TR have never been audible since they were established.
INSTITUTION CONDUCTED THE SURVEY:	Radio One (RO).
DATE:	June, 1994.

* * * * * * * * * *

6.5.2.3 Equipment Database

The 'EQUIPMENT' database deals with various equipment which are used in the whole process of radio services. This database will help planners and decision makers especially in engineering department/section to plan and/or decide on what kind of equipment should be treated how, when and where. That is, this database will indicate the types of equipment; their functions; their locations; their quality and quantity; as well as the suppliers.

Different records in the proposed 'EQUIPMENT' Database are expected to include: transmitting equipment, for example, AM radio transmitters; studio equipment, for instance, radio master switcher; measuring equipment, such as, audio test set or frequency counter; power supply equipment, for example, automatic voltage regulator; and antenna equipment, such as, feeder line or guy wire.

According to the survey findings of this study, it was realized at RTD that, some of the planners and decision makers in engineering department, could not be aware of various equipment which were used in different departments. The records for the equipment in RTD's seven booster stations were not well organized and/or up to date. This database is going to organize and update the data accordingly so as to help the users perform their duties smoothly. Figure 19 shows a sample record of the 'EQUIPMENT' Database.

Figure 19: Sample of EQUIPMENT Database Record

* * * EQUIPMENT RECORD * * *

NAME:	Microphone.
TYPE:	Condenser.
MODEL:	Tru Sonic Model C-2.
LOCATION:	Studio No.5 (RTD).
FUNCTION:	Transmission.
QUANTITY:	2
CAPACITY:	It has a very high frequency response, making it excellent for music.
MANUFACTURER:	Stephens Manufacturing Corporation (USA).
DATE OF MANUFACTURE:	1964.
DATE OF PURCHASE:	05 - 11 - 1986.
AMOUNT PAID:	@ TSh. 9,000.00
PRESENT REQUIREMENTS:	More microphones of this type are needed to be purchased and allocated at least one in each studio.

* * * * * * * * * *

6.6 INFORMATION PRODUCTS

6.6.1 Input Specification of Data

The sources of data of the prototype specialized databases are mainly: institutional, human (experts) and documentary. These are sources of information on radio broadcasting in: all radio stations, the DIB, and other institutions related to radio broadcasting sector.

Among documentary sources identified and used for this purpose include:

- the development of radio services from the Department of Broadcasting in the DIB.
- Audience Statistics from RTD and DIB.
- Research reports carried out by DIB, RTD, and private radios.
- Bureau of Statistics bulletins: topic about 'Broadcasting: Radio and Television'.
- Survey reports on Telecommunications in Tanzania: Annual Report by Tanzania Telecommunications Corporation.
- Audio Visual Institute: Reports on Broadcasting.
- Tanzania News Agency Annual Reports: Comments on Broadcasting.
- Tanzania School of Journalism: Research Reports on Broadcasting, by students and staff.
- University of Dar es Salaam, Faculty of Engineering: Reports on Development of Electronics in the Broadcasting

Sector; Faculties of Education and Arts and Social Sciences: Reports on Educational programmes.

- Annual/time to time reports from Foreign Broadcasting Agencies as mentioned in chapter 5 section 5.2.6.
- Research reports carried out by Foreign Institutions/Universities in assessing various campaigns, for example, The Uppsala University's Scandinavian Institute of African Studies on "AN EVALUATION OF A RADIO STUDY GROUP CAMPAIGN (1973)"; or by Cambridge University's International Extension College on "VOICES FOR DEVELOPMENT: THE TANZANIA RADIO STUDY CAMPAIGNS (1974)."

6.6.2 Output Formats

Various information products are expected to be produced by the proposed ISSRS in the DIB. Hard copies (printed formats) of products , such as, SDI, CAS, directories and statistical outputs will be produced for dissemination to contribute to the radio services development process.

6.7 INFORMATION SYSTEM REQUIREMENTS

To enable the proposed ISSRS be operational, there are several requirements which are considered to be the basic for its success. The following is the list of the system requirements.

6.7.1 Hardware

According to the survey carried out during this study, it was revealed that, above 60% of the microcomputers used by the information centres were IBM compatible ones. Taking this into consideration, the computer hardware to be purchased for the ISSRS is recommended to be 4 IBM compatible microcomputers. These four computers are for the DIB only: one in the Acquisitions section; the second in the Data Processing section; the third one in the Storage, Maintenance and Updating section; and the fourth computer to be placed in the Information Services Section . The other information centres recommended for nodes will be expected to use the available computers. Following are the recommended specifications:

- 486 Microprocessor;
- 4 MB RAM and Upgradable;
- 200 MB Internal Hard Disc Storage;
- 1.44 MB 3.5" Drive;
- 1.20 MB 5.25" Drive;
- 150 MB Straining Tape Drive;
- Capable of Running MS-DOS version 6.2;
- All necessary cables and connections;
- 2 Monochrome Graphics with 80 columns by 24 lines;
- 2 VGA Colour Monitors with 80 columns by 24 lines.

Keyboard Consideration

To get the best keyboard, the following considerations are to be taken into account:

- Convenience for Function Keys;
- Programmable Keys;
- Standard Alphanumeric Keys;
- Detachable Keyboard.

Printers

- 2 EPSON LQ1170 Dot-Matrix Printers;
- 2 Letter quality, Laser jet Printers;
- Both with automatic sheet feeders.

6.7.2 Software

The choice of software required include:

- Word Perfect 5.1;
- MS DOS 6.2;
- MICRO CDS/ISIS V.3+;
- Novelle (Network Software);
- dBase IV and V; and
- Lotus 1-2-3 R 3-1.

6.7.3 Accessories

The accessories recommended are:

- 5 Stabilizers (Uninterrupted Power Supply) matching with local power supply;
- 20 3.5" diskettes, and 10 5.25" diskettes;
- Ribbons;
- Dust Cover for each PC.

Although these requirements may change, nevertheless, the design was carried out using the above equipment, hence the same is being proposed for Tanzania.

6.7.4 Network

It is recommended that, the network to be established for the time being be Local Area Network (LAN) within DIB. The second step recommended is the Wide Area Network (WAN) within the institutions in Dar es Salaam. Then in the long run the established LAN will be connected to the nodes in other institutions located in different places of Tanzania in a WAN. This will be determined by the availability of facilities.

6.8 IMPLEMENTATION STRATEGY

The implementation strategy for the ISSRS depend on the acceptance of the proposal by the Tanzania Government through the Directorate of Information and Broadcasting (DIB). On the acceptance of this proposed information system, several considerations need to be put into account. First, is the fact that the ISSRS cannot be implemented at all once. This is because there are many factors which need to be considered. One factor is manpower development, to meet the requirements of the new system. Currently, there is only one qualified information professional at RTD, and the rest in all institutions in the sector are paraprofessionals who cannot exactly meet the requirements and demands of the existing information centres.

The existing documentation centre in the DIB, though not well organized, has some rich and valuable sources in the form of documents. These documents are going to need time to be adapted to suit the computer-based information support system. Conversion of documents cannot be accomplished in a very short time. In this regard, it will be quite helpful for the DIB and the government in general to understand the size of this work, and work out strategies to do it within a reasonable time.

In addition, a new space for the ISSRS will be required in the DIB. The current room for the existing documentation centre is poky and does not have a structure to allow for enough light and ventilation. This will need also to be solved if the ISSRS is to succeed in its mission.

The condition in Dar es Salaam where the ISSRS is going to be based, is very hot and humid. There is also dry season of about three months marked with heavy dust. This situation will require
air conditioning of the computer rooms for effective and efficient operation.

The above factors and many others which have not been mentioned, need financial support. Considering unhealthy economic condition in the country, it is likely to be impossible to accomplish the plan in a few months time. Therefore, it is recommended that, the ISSRS implementation be divided into phases for a period extending up to four to five years, depending on availability of funds. During this period, the qualified manpower needed will have been trained for take-off of the phases.

6.9 USER SYSTEM INTERFACE

User-System Interface is an important aspect of information storage and retrieval. Different types of interface to help the users to interact with the information retrieval system may be designed. The proposed ISSRS is expected to make use of the Micro CDS/ISIS software to render its services. CDS/ISIS is now widely used and version 3.0 can operate in a network environment like the one recommended in this study. CDS/ISIS network can enable users to interact directly from different terminals/nodes with databases in the server or in other

networked systems, to perform online search or retrieval. Most of the functions of Micro CDS/ISIS are menu-driven. However, 'Help' and other facilities can make the system more user friendly.

In this way, for the purpose of making use of the system with the prototype databases described earlier in this chapter, the 'SISA' (System Interface Search Assistance), written in CDS/ISIS Pascal will be used. 'SISA' is designed to assist end-users in performing search and retrieval in Micro CDS/ISIS databases. The main functions provided by SISA are:

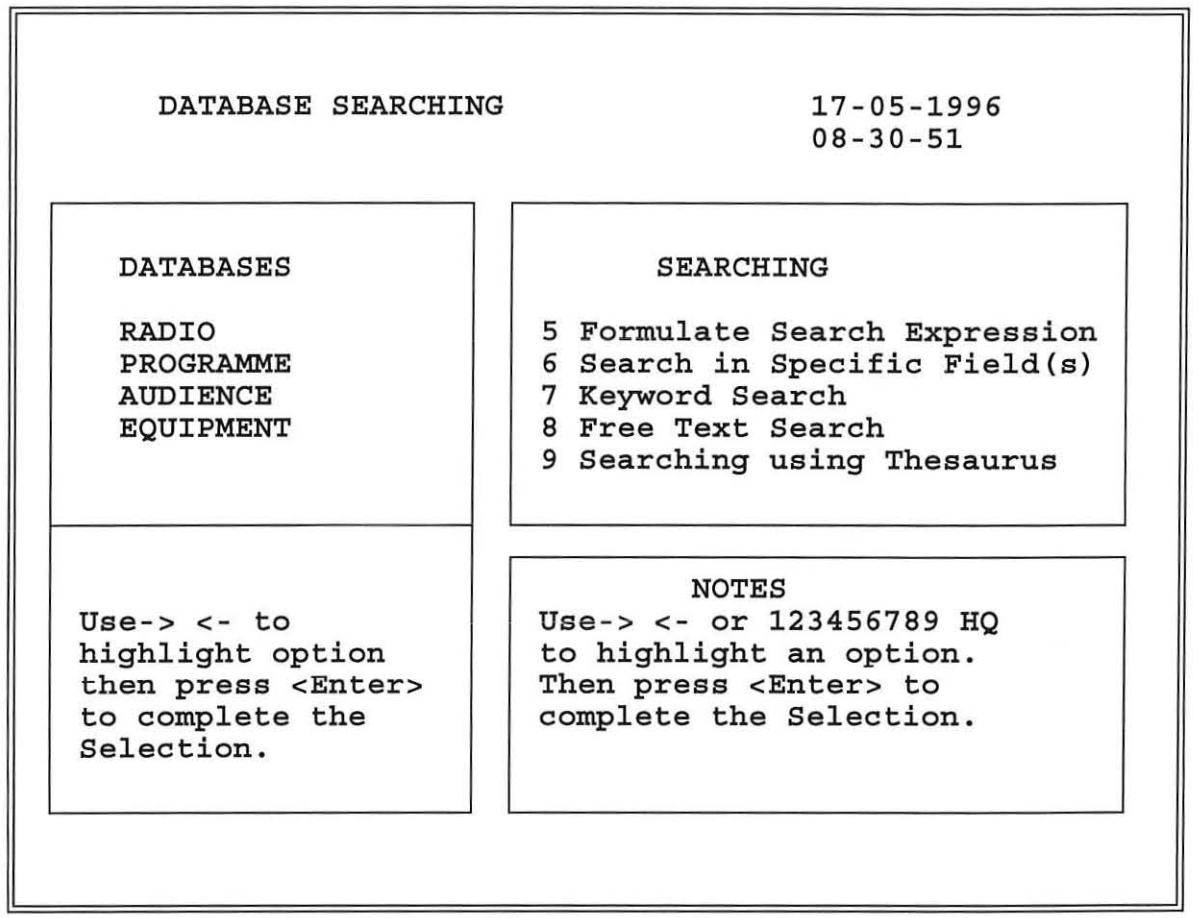
- Selection of databases for searching;
- Formulating of search expression using CDS/ISIS search language and use of the different search capabilities of CDS/ISIS;
- Retrieval and display of records using different display formats;
- Saving of retrieved records selectively; and
- Storing of search queries and the results for review of search performances on each database.

6.10 DEMONSTRATION OF THE PROTOTYPE

An advanced search facility - 'SISA' (System Interface Search Assistance), which is a pascal programme designed to enhance

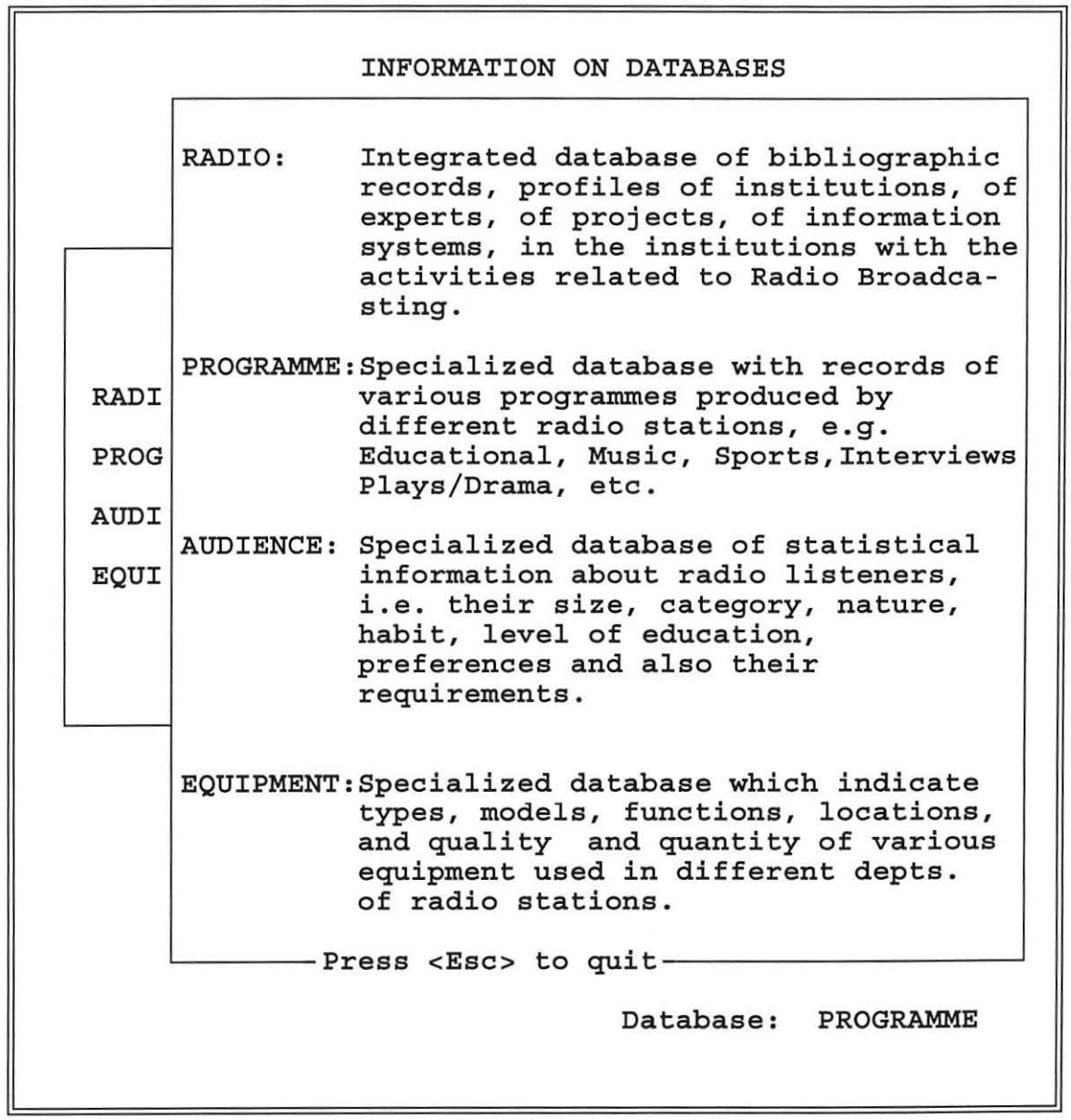
Suppose the user opts for option 1, the names of the available databases will be screened as shown in figure 21.

Figure 21: List of Available Database Names



Using appropriate arrow keys, the desired database is highlighted, and pressing <Enter> will select it. In this case, the user has to choose , 'PROGRAMME'. More information about the database is screened when the end-user press F1, which is equivalent to using option 2, as shown in figure 22.

Figure 22: Information on Databases (Screen)



Having selected the database, the system returns to the main menu to facilitate selection of the search options. At the bottom, the selected database name 'PROGRAMME' is indicated. After this step, the user has to choose option 5 whereby a blank screen asking a search expression will appear. At this point, the user has to type "Adult Education 1975". Then the

system conducts a search and enlists on the screen the available display format, which in this case is 'PROGRAMME'. Once the user chooses the formats, the system will display the output as shown in figure 17.

The application of 'SISA' interface in data retrieval in the proposed system, will strengthen its services. However, not every radio broadcasting developer (planners, decision makers and experts) can search the available data without facing problem(s). The illustrative guidance of 'SISA' interface makes it a necessary software to be acquired for the ISSRS. This software can be obtained by writing to: the Dean, School of Information Studies for Africa (SISA), Addis Ababa University, P.O. BOX 1176, ADDIS ABABA, ETHIOPIA.

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The poor performance of the existing information services, as it was revealed in the study, originate from among other things: the ineffective information flow pattern which fails to facilitate effective communication of information from the point of generation to the Directorate of Information and Broadcasting (DIB); lack of co-ordination between information centres dealing with radio services development and those related to it, with the DIB; inadequacies in data collection, processing and dissemination in the DIB documentation centre and other information centres in radio stations; low level of application of IT in handling and dissemination of information; inadequacy of trained information professionals; the absence of mechanism to facilitate information resource sharing like networking; and lack of funds. It was proved in the study that, the above factors have contributed in hindering the development of radio services. For example, inadequate, unreliable and untimely data and information, had caused: delaying and shifting of programmes unnecessarily; long time preparation of programmes; incomplete programmes aired; provision of out-of-date and/or wrong data; and also repetition of some programmes. The study revealed that, this inefficient situation needed a solution in order to meet the radio broadcasting sustainability goals.

Another factor which has created a gap in the information service sector, is the absence of a national policy on information systems and services. This has resulted the information centres in every sector work in isolation, with little effort to co-operate and to enhance their efficiency.

Information as a sector has been moved from one Ministry to another which indicate that the Tanzania government do not realize and/or recognize the essentiality of information in the national development process.

The vital role of radio as the contributor to the socio-economic development process is known among the radio services developers and also the audience. In Tanzania, the radio is the primary and/or the most extended medium of communication. In this regard, radio services need to be precise and adequate to cater for the audience's requirements. In order to enable the radio play its vital role, there is need for establishing a better means of obtaining, selecting, processing, storing and dissemination of information to adapt to the dynamism and time constraints of such a process. The better means of improving the information system in the radio broadcasting sector is by IT application.

The application of IT especially computer technology, has been cited as one such important consideration and the design of various referral and object-oriented databases as a necessary part of information infrastructure. It is expected that, IT application would strengthen the information support for radio services development processes in Tanzania. It, however, calls for a redesign and reorientation of the existing information system.

Tanzania government according to its perceived needs and national capabilities, has to invest in an IT policy/strategy

so as to come out with a master plan for IT acquisition, effective use, diffusion and sustainable development; link IT policy to its overall economic and industrial and other related policies; make the centres for R & D in IT available; make funds available for IT projects in the country, with the assistance of the business community or organizations, and ensure that employees are aware of the benefits and needs of IT and change.[1] That is, the knowledge of how to plan an IT strategy is essential among Tanzanians.In this sense, people have to be exposed to the fact that, information technology would solve many problems which have been hindering the effective and efficient means for collecting, processing, storing, retrieving and transmitting data/information. Successful IT use, is going to engender changes that would ensure healthy, assimilation, adaption and development of the technology to suit not only existing needs, but also the economy and manpower capability of the country.

The proposed Information Support System for Radio Services in Tanzania (ISSRS), is an attempt to overcome the mentioned deficiencies in chapter Five. The proposed ISSRS is going to work under the stages explained in chapter 6, section 6.7.4. For the time being, the recommended LAN can be supported by the existing communication facilities without significant problems. However, in the long run, the system is expected to be connected to all radio stations and other institutes contributing to radio services development in a WAN configuration. It is hoped by the researcher that, if this proposed ISSRS is adopted, is going to help in furnishing the

radio broadcasting sector with analyzed and synthesized data, in a readily usable form to meet the needs of the users involved in radio services development.

Information is a vital commodity, which, in addition to its being a renewable source, it is also capable of giving power and mastery to those who possess it.[2] It has also been pointed out that, the success of the developed countries in socio-economic development was through possession, and effective handling of information.[3] In this regard, Tanzania is required to increase its efforts in developing effective plans of handling and dissemination of information for sustainable socio-economic development.

Appropriate radio services development planning has a long term benefits as well as synergistic effect on the development of all other sectors of economy and social services. Investment in an activity towards the improvement of radio services, is socially and economically viable and thus should be given priority.

7.2 RECOMMENDATIONS

In the light of the above experience and lessons learnt in the course of this study, the following recommendations are preferred to alleviate the prevailing situation:

1. The planning unit in the Directorate of Information and Broadcasting (DIB), has to attract and encourage qualified radio broadcasting planners and researchers who have adequate experience and a wide background in computer applications if the whole radio services development planning exercise has to be productive.

2. The available information para-professionals in the sector must have further training so as to become qualified information personnel in order to provide effective and efficient information services to users.

3. User studies to identify sectoral information needs in general, and information needs for particular different user groups, for example, planners, decision makers, researchers, broadcasters, programmers, journalists and engineers/technicians, are necessary. The user studies are essential especially for the development of user-oriented services and value-added information products. Such studies can also shed light on the factors affecting the use of information, some of which could be socio-cultural or otherwise.[4]

4. There is need to design the forms to be used to collect the audience statistics so as to facilitate transformation of the data into machine readable form. This is going to facilitate also the treatment of statistics for comparative studies, and selection and preparation of statistics for planning purposes.

5. There must be a uniform information system strategies in all broadcasting sub-sectors (radio stations) to which their systems can be aligned, because without that, they would lack uniform standards for the development, operation and management of IT systems. In this regard, institutions have to emphasize better services through IT application, consider quality of information seriously, and measure their development or maintenance processes, products and resources through the use of software metrics.

6. In order that the information system in the DIB is strengthened, the information system in the identified institutions have to be effective as well. There is, therefore, a need for co-ordination in terms of data exchange through networking arrangements. Since most of the experts in the selected institutions expressed the desire for such a network even though their computer skills is low, a mutually compatible manual and automated information exchange is proposed.

7. The Tanzania government has to take deliberate measures to promote IT in the country in order to improve information communication. Currently, the application of IT in information handling is minimal. Computers are well known to be very powerful tools in processing and handling large quantities of data. In this sense, computer applications and traditional radio services have to overlap and merge to form information industry. This is going to form a more accurate model of acquiring, processing, storing and dissemination of information for the benefit of radio broadcasting developers on one hand,

who are going to perform their duties for the purpose of providing better radio services to the audience on the other hand.

8. Since independence (1961), the Tanzania Government has given less priority to information as a vital resource in the national development efforts. As a result no funds have been allocated straight to develop information services as a sector. It is high time now that the government realized and recognized information services as a vital sector and provide it with enough funds to develop for effective support in the development processes in all social and economic sectors.

9. There is a need to establish the National Information System to co-ordinate the information services in Tanzania. Currently, information sources and services are dispersed in many different libraries, documentation centres and archives, which work in isolation. This dispersal requires a mechanism to co-ordinate these information centres to enhance their efficiency. The establishment of a co-ordinating mechanism is going to help the function of the proposed ISSRS.

10. The Tanzania Commission for Science and Technology (COSTECH) has to establish a unit to be known as the National Computer Centre which has to carry out the strategic planning and co-ordinate the computing (IT) policy, and thus, control computing practices in the country. This centre is going to provide computer education by training various people from different sectors including radio broadcasting sector. In the

long run, each sector may establish its model computer centre for implementing policies and expertise adopted at the National Computer Centre for its own functional development.

11. Establishment of National Policy on Information Systems and Services to direct information services in the country is crucial. Currently, the information services are neither co-ordinated nor directed towards a clearly defined national goal. The national information policy is going to reflect the changing needs of today's information world, and give guidance to a coherent development of an information infrastructure in the country, particularly, radio broadcasting sector.

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APPENDIX 1: Letter of Introduction.

University of Dar-es-Salaam,
P.O. BOX 35092,
DAR-ES-SALAAM.

7th July, 1995.

Dear Sir/Madam,

RE: DEVELOPMENT OF AN INFORMATION SUPPORT SYSTEM FOR RADIO SERVICES IN TANZANIA.

I am a graduate student at the School of Information Studies for Africa (SISA), Addis Ababa University, Ethiopia. I am conducting a research on **"Development of an Information Support System for Radio Services in Tanzania"**.

My study, among other things, involves investigating the existing information system related to radio services in Tanzania, to understand how it operates. The information exchange pattern and the application of Information Technology (IT), are among the important issues to be investigated, with a view to proposing plans and recommendations to consolidate the services, by proposing a Computer-Based Information System to help the development of the radio services in Tanzania.

The information you provide in questionnaire will facilitate the planning and development of the prototype databases of radio services experts, programmes and projects undertaken, institutions related to this sector, and profiles of information systems.

Please assist me by filling in the attached questionnaire, which I need to get it on or before August 20, 1995. Completed questionnaire be returned to: Joseph M. Kabalimu,
University of Dar-es-Salaam,
P.O. BOX 35092, Fax 43241,
DAR-ES-SALAAM.

Thank you in advance, in anticipation of your co-operation!

APPENDIX 2: Sample of the Questionnaire.

QUESTIONNAIRE

SURVEY OF INSTITUTIONS AND INFORMATION SYSTEMS RELATED TO RADIO SERVICES IN TANZANIA

I. INSTITUTION'S PROFILE

1. a). Name of the institution:----------

   b). Type of institution: (public, private).

   Please, tick whichever applies.

2. Type of Information System in the institution (e.g. library, documentation centre, information centre,etc.)

   Please, choose or write whatever applies.

3.(a). Address----------

   (b). Telephone----------.c). Fax----------

4. Date of establishment----------

5. Objectives----------

   ----

6. Parent Organization/Ministry (if any)----------

7.(a). What is the end use of information generated or organized in the Information System?

   (i). Forecasting/modelling [ ]

   (ii). Resource allocation [ ]

   (iii). Research and Development [ ]

   (iv). Others (if any) please mention.

   (b). Type of documentation activities conducted by the information support system: tick whatever applies.

   (i). Bibliographic [ ]

(ii). Numerical/statistical [ ]

(iii). Referral [ ]

(c). Type of information services offered to the users (tick whichever applies).

(i). Reference services [ ]

(eg. Technical enquiry, retrospective searches,etc.).

(ii). Current awareness [ ]

(eg. Selective Dissemination of Information(SDI). Newsletters, bulletins, research in progress, etc.), please tick whichever applies.

(iii). Technical /Specialized services [ ]

(eg. trend reports, tender notices, forecasts, contracts,etc.), please tick whichever applies.

(iv). Information analysis and consolidation [ ]

(eg.research abstracting, digest for planners, decision makers, executives, etc.; numerical data services, etc.), please tick whatever applies.

(v). Common services [ ]

(eg. library services--i.e. acquisition, processing and storage of delivered documents.

(vi). Online services or CD-ROM services [ ]

(vii). Other services (mention if any)----------

---

8. What classification scheme does your information system use? (If it is classified).

(a). Library of Congress (LC) [ ]

(b). Dewey Decimal Classification (DDC). [ ]

(c). Universal Decimal Classification (UDC). [ ]

(d). Colon Classification System [ ]

(e). Others (specify if any)----------

9. Does your information system conduct the indexing exercise? YES/NO.

If YES, which kind of it is used? tick whatever applies.

(a). Author indexing [ ]

(b). Subject indexing [ ]

(c). Description indexing [ ]

(d). Title indexing [ ]

10. Number of staff of the Information System.

(a). Professionals (information Scientists, Documentalists, Librarians)----------

(b). Paraprofessionals----------

(c). Support staff----------

(d). Is the number of staff sufficient for the operations? YES/NO.

If NO, why?----------

---

11. Is your information system linked to:

(a). Any other information system (eg. Ministry of Information and Broadcasting; other radio stations). YES/NO.

(b). If YES, is the information exchange smooth? YES/NO.

If NO, why?----------

12. What usefulness of data, information and views you receive from your listeners? Tick whatever applies:

(a). Useful to planning section [ ]

(b). Useful to programming section [ ]

(c). Useful to technical section [ ]

(d). Useful to decision makers [ ]

(e). Useful to other sections [ ]

II. INFORMATION NEEDS AND USE OF INFORMATION SYSTEM:

13. Do you require information services provided by the information unit in your institution in carrying out your duties? YES/NO.

14. If the answer is YES, are the available information resources in your local information unit adequate to satisfy your information needs?

Adequate for my needs. [ ]

To a certain extent they meet my requirements. [ ]

Inadequate for my needs. [ ]

Any other comment----------

---

15. Where do you go regularly to get information?

Local information unit in the institution. [ ]

Libraries and documentation centres of International Organizations. [ ]

Foreign Cultural Centres. [ ]

University Libraries. [ ]

Public Libraries. [ ]

Special Libraries. [ ]

Information centres in various Ministries [ ]

16. Which other information systems do you use for your information needs apart from your institution's information unit?

Other information units in broadcasting sector. [ ]

University Libraries. [ ]

Public Libraries. [ ]

Special Libraries related to radio services [ ]

Other (please specify)----------

---

17. When you use other information systems, how long on average, does it take to receive the information you require?

Less than one week. [ ]

Between one and two weeks. [ ]

Between two and three weeks. [ ]

One month. [ ]

More than one month. [ ]

18. For what specific purposes do you require the information you seek from these information units?

Decision making [ ]

Performing technical duties [ ]

Preparation of programmes [ ]

Preparation of interviews [ ]

Research [ ]

Operational activities. [ ]

19. When is your information need greatest?

At the time of preparing a programme [ ]

Before conducting a research. [ ]

When conducting a research. [ ]

At the period of project/programme evaluation. [ ]

For my routine work. [ ]

20. What aspects of information do you regard as the most important factor for your information requirements?

Timely information. [ ]

Relevant information to the immediate needs. [ ]

Reliable information. [ ]

Information presented in simple and direct form. [ ]

Repackaged information. [ ]

Ease of access to the information services and resources. [ ]

21. What type of information do you require for your needs? (Tick whatever applies).

Summarized information. [ ]

Full document. [ ]

Reviews of original documents. [ ]

Critical summary. [ ]

Descriptive summary. [ ]

Abstracts. [ ]

Full text database. [ ]

CD-ROM media. [ ]

Statistical. [ ]

Information contained in articles. [ ]

Information contained in books. [ ]

Information contained in files. [ ]

Verbal information. [ ]

22. What kind of information do you need mostly?

(specify briefly)----------

---

23. How many hours of your working time do you spend searching for information?

Less than two hours. [ ]

Between two and three hours. [ ]

Between three and four hours. [ ]

Between four and six hours. [ ]

Over six hours. [ ]

24. How long does it take you to use (read) the information you obtain?

Less than two hours. [ ]

Between two and three hours. [ ]

Between three and four hours. [ ]

Between four and six hours. [ ]

Over six hours. [ ]

25. How do you value the information generated in the broadcasting sector in relation to your information needs?

Highly valuable. [ ]

Valuable. [ ]

Reliable to meet my information requirements. [ ]

Unreliable. [ ]

26. How often do you use information facilities provided by your institution information unit?

Frequently. [ ]

Sometimes. [ ]

Only when I need to find out something I do not know. [ ]

When I am working on a project/study. [ ]

When I need to make a decision. [ ]

27. Are you involved in the decision-making and development planning of the information unit? YES/NO.

28. If NOT, is there a provision for you to influence decisions regarding the development of the information unit? YES/NO.
If the answer is YES, please specify----------

---

29. What kind of services and facilities do you believe can contribute to the improvement of the existing information services?

Services that would permit on-line access to its database. [ ]

Rapid transmission of texts or reviews. [ ]

More staff. [ ]

Extension of opening hours. [ ]

Cooperation with other information systems. [ ]

Computer mediated electronic network communication system in the sector. [ ]

30. Does your background education help you identify your information needs? YES/NO.

31. How do you go about searching for the information you require?

Do research myself. [ ]

Rely on colleagues. [ ]

Use the services of in-house information specialist. [ ]

Avail myself to the services of the professionals outside my institution. [ ]

Use research assistants in information gathering. [ ]

Use the services of the librarians and/or documentalists. [ ]

Other sources of information (please specify)

III. COMPUTER-BASED INFORMATION SYSTEM SURVEY

32. Does your institution have any computer facilities? YES/NO.

33. If YES, is the information support system computer-based? YES/NO.

34. Where are the computer facilities located? Indicate by tick.

    (a). In the information centre [ ]

    (b). In the studios [ ]

    (c). In the laboratory [ ]

    (d). In difference offices of the institution [ ]

    (e). Other locations, please specify----------

    ---

35. What are the main applications of computers in the institution/information system? Tick whatever applies.

    (a). Word processing [ ]

    (b). Data management functions [ ]

    (c). Numerical/statistics applications [ ]

    (d). Financial management [ ]

36. What kind of computers are used by your information system? Please, mention the number (quantity) of them and model.

(a). Mainframe: number----------model----------

(b). Minicomputers: number----------model----------

(c). Microcomputers:number----------model----------

37. Is the system networked? YES/NO. If YES, what kind of network configuration is used?

(a). Local Area Network (LAN) [ ]

(b). Wide Area Network (WAN) [ ]

(c). Global Network (GN) [ ]

38. Does your institution have CD-ROM/Online databases? YES/NO.

If YES, please name them----------

---

39. What kind of database management which your information system deals with (if any)? Please, indicate type by ticking.

(a). Bibliographic [ ]

(b). Profile of programmes [ ]

(c). Other profiles (eg. experts, institutional, etc.) [ ]

(d). Others (specify if any)----------

40. What kind of problems do you encounter in the use of computers in your information system (if any)? Tick whichever applies.

(a). <u>Equipment:</u>

(i). lack of software [ ]

(ii). little computer memory [ ]

(iii). Slow processing speed [ ]

(iv). Poor environment conditions (eg. heat,

dust, unstable electricity, etc.). [ ]

(b). Personnel problems:

(i). Manpower shortage [ ]

(ii). Lack of training opportunities in computer use [ ]

(iii). Any other. Please specify----------

---

41. Are the members of staff trained in the use of computers? YES/NO. If YES, what is the percentage of those trained in the staff?----------

42. If your information system is not yet computer-based, are there any plans in the near future to do so? YES/NO. If YES, what kind of computers in mind do you want to apply?

(a). Mainframe [ ]

(b). Minicomputers [ ]

(c). Microcomputers [ ]

43. What kind of application(s) do you intend to make after installation? Please give a short explanation.

IV. EXPERTS' PROFILE

Main Name----------

Other Names----------

Sex----------Year of Birth----------

Nationality----------

Permanent Address----------

Telephone----------Fax----------

Academic Qualifications:

(A). Field of Study----------

Degree/Diploma/Certificate----------

Year Obtained----------

Name and Place of Institution----------

(B). Field of Study----------

Degree/Diploma/Certificate----------

Year Obtained----------

Name and Place of Institution----------

(C). Field of Study----------

Degree/Diploma/Certificate----------

Year Obtained----------

Name and Place of Institution----------

Main Fields of Specialization----------

Publications----------

Main Working Language(s)----------

Current Employer----------

Title of Post----------

Duration: From----------To----------

Description of Responsibilities----------

Last Employer----------

Title of Post----------

Duration: From----------To----------

Description of Responsibilities----------

THANK YOU VERY MUCH FOR FILLING IN THIS QUESTIONNAIRE !

APPENDIX 3: List of Questions for Interviews.

1. What is the structure (set-up) of the organization, and what are your organization's main objectives?

2. What kind of information do you require for the radio services development?

3. What are the sources of information you depend-on/consult for your day to day activities or planning/research purposes?

4. What methods do you use in capturing or generating the data/information e.g. do you use questionnaire, interviews, survey or radio listeners bring information here?

5. How do you process, store, retrieve and disseminate the information?

6. How do you know or get the audience's requirements/needs/demands and/or their tastes/interests/preferences?

7. How have succeeded in providing radio services to the masses and what have been your main problems?

8. Does your information system provide all the relevant information and data needed for your activities in the process of radio services development? Consider this in terms of the following information characteristics:
   - Relevance;
   - Coverage;
   - Timeliness;
   - Accuracy;
   - Adequacy;
   - Validity.

9. What services does the information system render? (e.g. CAS, SDI, Referral Services,etc.).

10. In your view, does the information system offer satisfactory services?

11. Is your Information Support System computerized?

12. Which ways do you think the information system can be modified to meet your activities related to radio services development?

13. How do you cooperate with other radio stations - e.g. exchange of data/information, joint seminars/workshops, etc.

14. What are your plans, priorities or strategies for improving radio services in Tanzania?

APPENDIX 4: List of People Interviewed.

1. Mr. A. Ngororo -Former RTD Director.
2. Mr. A. Lyema -Head, Administration Department (RTD).
3. Mr. K. Ponela -Head, Programmes Department (RTD).
4. Mr. H. Nyundo -Head, News and Current Affairs Department (RTD).
5. Mr. T. Ussi -Head, Engineering Department (RTD).
6. Ms. Mbotoni -Head, RTD Libraries.
7. Mr. J. Tesha -Head, Current Affairs Section (RTD).
8. Mr. C. Magula -Head, News Section (RTD).
9. Mr. S. Mzee -Newsroom (RTD).
10. Mr. B. Mwang'onda -Newsroom (RTD).
11. Mr. B. M. Kapinga -Head, Radio Transmitters and Former Head of Technical Training.
12. Mr. H. E. Lusanda -Engineering/Studio (RTD).
13. Ms. K. Malongo -Accounts Section (RTD).
14. Mr. Msemembo -News and Current Affairs (RTD).
15. Ms. Kidasi -Administration Department (RTD).
16. Ms. F. Hamisi -Training Officer (RTD).
17. Ms. E. Sanga -Project Section (RTD).
18. Ms. R. Haji -Project Section (RTD).
19. Mr. A. Jongo -RTD (Booster Station) Arusha.
20. Mr. B. Kombwa -RTD (Booster Station) Dodoma.
21. Mr. P. Makorongo -RTD (Booster Station) Dodoma.
22. Mr. J. Ngondaye -RTD (Booster Station) Mwanza.
23. Mr. M. Mahamud -Radio One (RO).
24. Mr. C. Hillary -Radio One (RO).
25. Mr. J. Nyaisanga -Radio One (RO).
26. Mr. M. Juma -Voice of Zanzibar Tanzania (VZT).
27. Ms. M. Charles -Tumaini Radio (TR).

28.Ms. T. Raymond _Radio Voice of Gospel (RVG).

APPENDIX 5: ABNCD Field Definition Table

?	Tag	Name	Len	Typ	Rep	Delimiters/Pattern
-	1	Participating centre code	100	x		
-	2	Participating centre record no	6	N		
-	3	Record Status	1	P		A
-	5	Date record entered	10			P9999-99-99
-	6	Date record changed	10	P		
-	7	Bibliographical level	5	A		
-	8	Bibliographical - parent	1	A		
-	9	Country of origin of record	2	P		AA
-	10	Record No parent	6	N		
-	11	Record number(s) of part(s)	6	N	R	
-	12	Record no of other lang ver (s)	6	N	R	
-	20	Language of analysis	18	A		
-	21	Language of text (s)	2	A	R	
-	22	Language (s) of summaries	2	A	R	
-	25	Record heading	50	X		
-	100	Title	500	X		
-	100	Parallel title (s)	500	X	R	
-	102	Translated title - English	500	X		
-	105	Translated title - other	500	X		
-	110	Personal author (s)	80	X	R	ab
-	111	Corporate author (s)	500	X	R	abcdz
-	112	Affiliation	500	X		abcdz
-	113	Other associated inst (s)	500	X	R	abcdez
-	114	Meeting	500	X		abcde
-	115	Trans. name of instn.	200	X		
-	116	Address	300	X	R	abcdefghi
-	120	Edition	25	X		
-	121	Publisher	250	X		abc
-	122	Date of pubi/issue-free form	30	X		
-	123	Date of pubi/issue-150 form	10	P		9999-99-99
-	130	Collation (M/C)	200	X		abc
-	131	Part Statement	150	X		ab
-	140	Mongraphic series	200	X	R	abz
-	141	Thesis	200	X		abcd
-	142	Related Project (s)	200	X	R	ab
-	150	Notes	700	X		
-	160	ISBN	13	X	R	
-	161	Document number	50	X	R	
-	162	Availability	100	X		

-	200	Title of serial	400	X		Z		
-	201	issn					9	9999-99-99X
-	200	Title of Parent (M/C)	500	x				
-	210	Personal author (s) - parent	80	X	R	ab		
-	211	Corporate aughor (s) - parent	500	X	R	abcdz		
-	300	Primary descriptors	200	X				
-	301	Secondary descriptors	400	X				
-	302	Geographic descriptors	200	X				
-	303	Local descriptors	200	X				
-	303	Proposed descriptors	100	X				
-	310	Abstract/Description	1000	X				
-	320	Broad subject heading	100	X				
-	400	Processing status	4	X				
-	410	Location	10	X				
-	411	Call number	40	X				
-	412	Number of copies	2	N				
-	415	Accession numb	10	X				
-	420	Type of material			50	X		
-	430	Documetalist (initials)	10	X	R			
-	500	Acquisition type	4	X				
-	509	Order number	25	X				
-	510	Date ordered	10	P		9999-99-99		
-	511	Date claimed	10	P		9999-99-99		
-	512	Date received	10	P		9999-99-99		
-	513	Number of copies ordered			2	N		
-	514	Requester	25	X	R			
-	515	Supplier	200	X		abcdez		
-	516	Price	20	X		ab		
-	517	Acquisition notes	200	X	R			
-	901	Corporate body	500	X	abcd			
-	902	See reference (s)	500	X	R			
-	903	Other language version (s)	500	X	R			
-	904	Former name(s)	500	X	R			
-	905	Later name(s)	500	X	R			
-	908	Reference code	20	X				
-	911	Serial Title	400	X				
-	912	ISSN	9	P		9999-999X		
-	913	See reference(s)			400	X	R	Z
-	914	See also other lang edition(s)	400	X	R			
-	915	Former name(s)	400	X	R			
-	916	Later name(s)	400	X	R			
-	921	Supplier authority code	4	X				
-	922	Supplier name and address	200	X		Abcde		
-	997	Authority record notes	200	X				
-	998	Authority record date	10	P		9999-99-99		
-	441	Duration	50	X				
-	442	Date:proposal/approval	25	X		ab		
-	443	Date: Starting	10	X				
-	444	Date expect. compl	10	X	R			
-	445	Date: actual compl	10	X				
-	446	Date: terminated			10	X		
-	447	Date of birth	100	X				
-	830	Nationality	100	X	R			
-	831	Qualifications	100	X	R	abcd		
-	832	Specification	100	X	R			
-	833	Work experience (last)	200	X		abcde		
-	834	Current work	200	X		abcde		
-	835	Marital status	10	X	R			
-	836	Sex	6	X				
-	850	Recommended by	100	X	R	abcd		
-	855	Honours and awards	200	X		abc		
-	856	Membership in societies	200	X	R	abcd		
-	525	Language competence	100	X	R	abc		
-	556	Assignments	200	X	R	abcd		
-	895	Databases	300	X	R	ndrfa		
-	896	Classification system used	100	X	R			
-	897	Subject headings list	100	X	R			
-	898	Theasurus	100	X	R			
-	899	Periodical Publicat.	300	X	R	ij		
-	890	Patents taken	200	X	R	abcdefgh		
-	900	Services offered			200	X	R	
-	570	Personnel	100	X	R	ab		
-	625	Objectives	500	X	R			
-	700	Financial aspects	200	X	R	Sacp		
-	950	Project status	50	X				
-	952	Training courses			200	X	R	
-	954	Project number	50	X	R	a		
-	955	Contract number	50	X	R			
-	957	Resources (equipment...)	200	X	R			
-	960	Type of institution	100	X	R			
-	961	Type of research			100	X	R	
-	965	Research priority	100	X				
-	966	Commitee's decision	100	X				
-	999	Record type	1	P		A		
-	1000	Name of object	100	X				
-	1001	Local name (Eng.)	100	X	R			
-	1010	Function	300	X	R			
-	1015	Source/Donor (Person)	100	X	R	sfh		
-	1016	Source/Donor (Organization)	300	X	R			
-	1017	Vendor	300	X				
-	1018	Price	100	X				
-	1020	Provenance	100	X				
-	1021	Archaeological site	500	X				
-	1025	Ethnic group	100	X				
-	1028	Date	100	X				
-	1030	Material	300	X	R			
-	1035	Condition	1000	X	R			

-	1040	Dimension (Front)	100	X		hwld		
-	1041	Dimension (Back)			100	X		hwld
-	1042	Weight	100	X				
-	1050	Description	1000	X				
-	1055	Fine number	100	X				
-	1056	Photo number	100	X	R			
-	1060	Negative number	100	X	R			
-	1065	Accession number			100	x		
-	1070	Other numbers	100	X	R			
-	1075	Location/storage			100	X		rs
-	1080	Location/exhibit			100	X		rs
-	1085	Classification/keywords	100	X	R			
-	1090	Treatment	500	X	R			
-	1091	Lab. treatment dates	25	X	R			
-	1100	Exhibitions	300	X	R			
-	1105	References	300	X	R			
-	1110	Remarks	300	X				
-	1115	Date of entry	20	X				
-	1120	Date(s) of update	20	X	R			

APPENDIX 6: Integrated database 'RADIO' Field Select Table

	ID	IT	Data extraction format
-	5	0	V005
-	21	0	(V21/)
-	100	4	V100
-	110	0	(V110)
-	111	0	mhl,v111^a |%|
-	111	0	mhl,v111^b |%|
-	111	4	(v111^b || ,v111^a |%|),V112^||^,V112^a|%| (v113^b || ,v113^a |%|)
-	111	0	(v111^c/,v111^d/,v111^z/)
-	111	0	v112^c/, v112^d/, v112^z
-	111	0	(v113^c/, v113^d/, v113^z/)
-	112	0	(v112^a/, v112^b/, v112^c/)
-	113	0	v113
-	114	4	v114^a+ |%|
-	114	0	(v114^b,v114^c/, v112^e/)
-	116	0	(v116/)
-	120	0	v120
-	121	0	v121
-	122	0	v122
-	150	0	v150
-	160	0	v160
-	200	0	v200
-	201	0	v201
-	300	2	v300
-	300	3	v300
-	301	2	v300,v302,v303,v304
-	302	0	v302
-	303	0	v303
-	310	4	v310
-	320	0	v320
-	410	0	(v410)
-	411	0	v411
-	412	0	v412
-	441	0	v441
-	443	0	v443
-	445	0	v445
-	447	0	v447
-	525	0	(v525/)
-	570	0	(v570/)
-	625	0	(v625/)
-	700	0	(v700/)
-	830	0	(v830/)
-	831	0	(v831/)
-	832	0	(v832/)
-	834	0	v834
-	836	0	v886
-	895	0	(v895/)
-	896	0	(v896/)
-	897	0	(v897/)
-	898	0	(v898/)
-	899	0	(v8991)
-	900	0	(V9001)

-	950	0	(V9501)
-	960	0	(v9601)
-	961	0	(V9611)

APPENDIX 7: Worksheet and Display Formats

a) Worksheet for Profile of Experts

Type of record (999)E Record heading PROFILE OF EXPERTS.....

Date record entered.....
Name of person .....
Sex.....
Affiliation.....
Address.....
Date of birth.....
Assignments.....
Nationality.....
Formal educational qualifications .....
Language competence .....
Discipline.....
Work experience .....
Current work .....
Project title .....
Recommended by .....
Honours and awards .....
Membership in associations .....
Marital status .....
Remarks/Notes.....
Person entering data.....

b) Display Format of Profile of Experts

```
If v999: 'E' then mhl,c10, '*** PROFILE OF
EXPERTS
***'##/c2,'NAME :'v110/c2,'DATE OF BIRTH
: 'V447/c2,'sex :V836/c2,'NATIONALITY
: 'V830/c2,'AFFILIATION : 'v112(23,22)/c2, 'ADDRESS
: '(v116^b,|, |v116^c,|, |v116^e, ", ", "Phone
"v116^f(23/22), ", ", "Telex "116^h(23,22), ", ",
"Fax
'200(23,22)/c2,'QUALIFICATIONS :'v831/c2,'SPECIALIZATION

: 'V832(23,22)/C2, 'WORKING LANGUAGE : '525/c2,'CURRENT
EMPLOYMENT : 'V834/C2, 'PREVIOUS WORK :
'V833/,'********************'##fi
```

C) Worksheet for Records of Profile of Institutions and Information Systems

Record type (999)I Record heading PROFILE OF INSTITUTIONS.....

Date record entered (5).....
Principal officers (110).....
Name of Institution (111).....
Trans. name of instn. (115).....
Parent organization (960)^a .....
Address (116) .....
Location (410) .....
Working language (525.....
Associatedentities.....
Services offered .....
Descriptor.....
Geographical area .....
Discipline.....
Financial aspects .....
Resources (equipment).....
Membership in societies .....
Honours and awards .....
Date of establishment.....
Type of research .....
Objectives.....
Personnel.....
MFNs of publications.....
Note.....
Activities.....
Periodical publicat .....
Person entering data .....

d) Display Format of Profile of Institutions

```
If  v999:'I'  then  mhl,c10,'***  PROFILE OF INSTITUTIONS
   ***'##/c2,NAME OF INSTITUTION    : '111(26,25)/c2,
'TRANS.  NAME   : 'v115/c2 'ADDRESS        : 'V116^b,|,
|V116^c,|, |V116^e ", ","Phone "v116^f(26,25),", ","Telex
|116^h(26,25),", ","Fax "116^i(26,25(#/c2, 'DIRECTOR
: 'v110/c2,'DISCIPLINE      : 'v320/c2, 'YEAR OF
ESTABLISHMENT   :  'v443/c2, 'NUMBER OF STAFF
'V570(26,25)/c2,'ASSOCIATED ENTITIES
:'V113(26,25)/C2,'TYPE
OF INSTITUTION  : 'V960/C2, 'TYPE OF RESEARCH
'V961/C2, 'OBJECTIVES     :  'v625(26,25)/c2, 'WORKING
LANGUAGE(S)    :  'v525/c2, 'PARENT ORGANIZATION     :
'V112/C2, 'publications    : 'V899(26,25)/C2, 'GEOGRAPHIC
COVERAGE    : 'v302+|,    |##/c2, 'DESCRIPTORS
'v899(26,25)##/c2, 'ABSTRACT
'v310(26,25)/, #**************************'##fi
```

e) Display Format of Information Systems

```
If v999:'S' then mh1,c4,'*** INFORMATION SYSTEMS
***'##/c2,'NAME OF SYSTEM : 'v111/c2, 'DATE OF
ESTABLISHMENT : 'v443/c2, 'HEAD OF INSTITUTION
'v110/c2, 'PARENT ORGANIZATION : 'v112/c2, 'ADDRESS
: 'v116^b,|, |,v116^c,|, |,"Phone "v116f,", ","Telex
"v116^h(24,23), ", ""Fax "116^i(26,25)/c2, 'DISCIPLINE
: 'v320/c2, 'PERSONNEL : 'V570/C2, 'SERVICES
OFFERED : 'v900(24,23)/c2, 'DATABASES
'V894/C2, 'classification system : 'v896/c2, 'SUBJECT
HEADING LIST : 'v897/c2, 'THESAURUS : 'v898/c2,
'WORKING LANGUAGE : 'v525/c2, GEOGRAPHICAL COVERAGE
: 'v302, ", "/#C16,'**********'##fi
```

f) Worksheet for Records of Research Projects

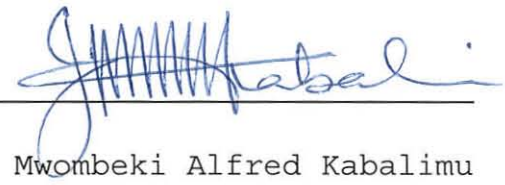
Record type (999)P Record heading RESEARCH PROJECTS.....

```
Date record entered.....
Project title .....
Principal officers .....
Performing institutions.....
Type of institution .....
Other associated institutions.....
Address (Phone, etc) .....
Project number(s) .....
Contract number(s) .....
Language of project .....
Location .....
Duration .....
Current status of project .....
MFNs of Related Projects.....
Descriptor .....
Geographical area.....
Discipline .....
Financial aspects .....
Resources (equipment) .....
Research priority.....
Committee's Decision .....
Date: Proposal/Approval.....
Date: Starting .....
Expected completion .....
Date: Actual completion .....
Date terminated .....
Type of research .....
Recommended by .....
Objectives .....
```

Resource Persons.....
Resource Persons type.....
Personnel .....
MFNs of publications.....
Note.....
Abstract/Description.....
Person entering data.....

DECLARATION

This Thesis is my original work and has not been submitted for a degree in any other University.



Joseph Mwombeki Alfred Kabalimu

May, 1996.

The Thesis has been submitted for examination with my approval as University Advisor.

Dr. G. A. Alabi.

May, 1996.