

ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES
SCHOOL OF INFORMATION STUDIES FOR AFRICA



AN INFORMATION SUPPORT SYSTEM FOR INDUSTRIAL
DEVELOPMENT IN UGANDA WITH SPECIAL REFERENCE
TO THE SMALL-SCALE SECTOR: A PROPOSAL

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE
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BY

JAMES MATOVU

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SCHOOL OF GRADUATE STUDIES
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A PROPOSAL

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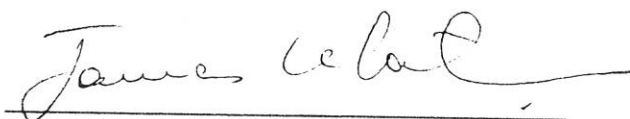
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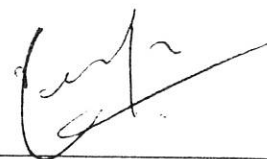
DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.



Signed
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24th May 1994

The thesis has been submitted for examination with our approval as University advisors



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DEDICATION

This thesis is dedicated to my wife Victoria, daughter Loussie and son Philip, who endured my stay away from home for a period of two years.

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I should state it here that the views contained in this document were a contribution of all those groups of people mentioned above. However, I must excuse them of all the shortcomings and limitations that may be reflected in this document as these are mine and mine alone.

Lastly, I must express my appreciation to the International Development Research Centre (IDRC) of Canada for awarding me a scholarship enabling me to take up this course in SISA.

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ABSTRACT

The role of information in the scientific, technical and socio-economic development of nations is becoming widely accepted. In what has come to be referred to as the "information age", a larger percentage of people in the developed world are now employed in the information sector and the same trend is perceptible in the industrialising economies as well. In Uganda, the future of the country lies in the rejuvenation of the industrial sector, which presently, accounts for less than 5 per cent of the GDP. More than 80 percent of the manufacturing sector in Uganda is comprised of small scale enterprises. The problems faced by the SSIs are numerous and diverse. However, a critical analysis of these problems reveal that they all have a bearing to the information situation in the country, which presently remains grossly ill-developed.

Twice the government of Uganda, assisted by international agencies has tried to address the issue of industrial information in the country. These two attempts, however, proved futile, partially due to poor perception of information as a resource by planners, decision makers, manufacturers, etc.

With the advent of information technology, the information component has gained new dimensions. Information technology (IT) is today an indispensable tool in the capture, storage, processing, analysis and dissemination of data and information in industries as well as in other organisations. IT application has transformed information systems and centres from mere custodians of information to a

management tool of industries. Its impact is being felt in all sectors of the national economy, the manufacturing sector in particular. Information, industrialisation and economic development are a mutually synergising trinity.

This thesis discusses the relevancy of information systems and centres in industrialisation from Uganda's point of view. It proposes the need to develop a national scientific, technical and industrial information centre (NSTIIC). It is proposed that among other things, NSTIIC should aim at bringing together in a network of database system, all institutions, organisations, etc., whose activities and functions are contributory to the growth of the industrial sector in Uganda. It also advocates for a serious campaign to sensitise planners, decision makers, manufactures and all those involved in guiding the national economy, big or small, so as to help them develop an information culture in their day-to-day activities.

ABBREVIATIONS

APT	Appropriate Technology
CAS	Current Awareness Service
CCF	Common Communication Format
CMA	Canadian Manufacturers Association
GDP	Gross Domestic Product
IAC	Information Analysis and Consolidation
ILO	International Labour Organisation
ISO	International Standards Organisation
ITIU	Industrial Technological Information Unit
MTAC	Management Training and Advisory Centre
MOIT	Ministry of Trade and Industry
MUL	Makerere University Library
NGO	Non-Government Organisation
NCST	National Council of Science and Technology
NRM	National Resistance Movement
NSTIIC	National Science, Technical and Industrial Information Centre
PTA	Preferential Trade Area
SAP	Structural Adjustment Programme
SMI	Small and Medium Industries
SSI	Small-Scale Industry
TIC	Trade Information Centre
TIS	Trade Information Service
UBS	Uganda Bureau of Standards
UDC	Uganda Development Corporation

UEPC	Uganda Export Promotion Council
UMA	Uganda Manufacturers Association
UMACIS	Uganda Manufacturers Association Consultancy and Information Service
UMAIC	Uganda Manufacturers Association Information Centre
UNCC	Uganda National Chamber of Commerce
UNDP	United Nations Development Programme
UNIDO	United Nations Industry Development Organisation
UPK	Uganda Polytechnic Kyambogo
USIDO	Uganda Small Industry Organisation
USSIA	Uganda Small Scale Industries Association
UTIS	Uganda Technical Information Service

CHAPTER 1

INTRODUCTION

1.1 PROBLEM DEFINITION

1.1.1 The Industrial Sector in Uganda

Up to early 1970s, Uganda enjoyed one of the highest standards of living in Africa. Between 1962 to 1971, Real Gross Domestic Production (GDP) grew by an average of 5 per cent per annum, with per capita income rising at 2 per cent per annum. Between 1962 and 1970, the industrial sector grew at a rate of 6 per cent and accounted for about 12 per cent of the monetary GDP, and 8 per cent of the total GDP. Social services were good and widely distributed, exports were diversified, and the industrial sector was very healthy.

From early 1970s, this rate of growth in the industrial sector began to slow down, eventually turning negative. The industrial survey carried out in 1971, reported a total of 970 industrial units each employing ten or more people and a much larger number of cottage industries and small workshops scattered throughout the country each employing less than ten persons. A similar study of the then existing industries carried out in 1981, recorded only 464 establishments, and almost all of them working at less than 20 per cent of installed capacity.

1.1.2 Specific Problems

In January 1971, the armed forces overthrew a democratically elected government and, themselves assumed power. This marked the beginning of a series of dictatorial governments in Uganda. Immediately after the military takeover, the new government decided to expel all the Asians in the country, who at this time dominated the business and industrial sectors. They also decided to nationalise a majority of the foreign owned enterprises, including industries. All the nationalised enterprises were turned over to a parastatal body, the Uganda Development Corporation (UDC), which at this time was in charge of all government owned industries. Overnight, UDC assumed management of an additional one hundred enterprises. This overstretched UDC's management capability, mismanagement crept in and the industries started crumbling slowly.

The rest of the enterprises were summarily allocated to the local Ugandans, a majority of whom, lacked the necessary managerial skills and technical know-how. Many resorted to looting the same enterprises through frivolous spending. Gradually, these also began to crumble.

In reacting to the nationalisation of private enterprises by the Uganda government, the international community together with their donor agencies imposed an economic embargo on Uganda by withholding aid. This led to an acute shortage

of hard currency in the country, which was badly required for procurement of industrial inputs and spare parts. Gradually, machinery in industries started breaking down without the means to repair or make replacement.

The deterioration of the transport network arising from inadequate road maintenance, loss and damage of road vehicles during the relentless wars, and the impact of the breakup of the East African Community on railways and air services also had a negative impact on the industrial sector.

All these factors combined led to a total disintegration of the once an enviable industrial sector in Eastern Africa.

1.1.3 Possible Solutions

Since the accession to power by the National Resistance Movement (NRM) government, there has been a steady improvement in the management of economic and social affairs of the country. The NRM government recognises very well the immense contribution the industrial sector can provide in the revival of the country's economy. After a diagnosis of the serious ills of the industrial sector, the government has come up with the following strategies: (Rehabilitation and Development Programme 1987/88 - 1990/91)

1. Diversification of agricultural production to increase food production, to diversify exports, and to supply inputs to industry;
2. The building of genuine and efficient import substitution industries;
3. The development of agro-based industries;
4. The development of an efficient basic industry sector and a domestic capacity to produce capital goods; and,
5. Development of a relevant and appropriate technology consistent with this development strategy;

1.2 JUSTIFICATION OF THE STUDY

The purpose of this study is to explore the role information systems can play in the rebuilding of the industrial sector in Uganda, especially through promoting better utilisation of the scientific and technological information.

It should be noted here that scientific, technological and managerial information today is a key resource in the social and economic development of nations. Uganda, however, has so far not paid adequate attention to the development of science and technology and managerial capacity. Unlike Kenya and Tanzania, Uganda has had no official policy regarding science and technology, although an effort is now being made to create one; (Tindimubona 1991). Indeed, there has been, for a long time, research taking place in a number of research units in the country, but this has made very little impact on the country. The main reason here being that there has been not any proper coordination between industries and the research institutes, especially the small scale industries.

Although some progress is now being made in the industrial sector, it is far from the optimum that would be expected, given the amount of investment that the NRM government and other agencies has made in this sector since 1986. The

variance between the planned and actual growth in output, a characteristic of Uganda's economy, can be attributed to a number of factors. However, the most outstanding has been lack of access to or provision of adequate, reliable, and timely information to planners, investors, managers, and other decision makers. This, many times, has resulted in the country embarking on unviable projects, leading to wastage of large amounts of the scarce resources; (Uganda Confidential 1993). Managers in many firms often take wrong decisions, mainly due to lack of timely, adequate and correct data. Lack of adequate information has also resulted in import of inappropriate machinery and equipment, and sometimes, it has caused government and individuals to deal with incompetent and unscrupulous firms during project implementation.

It should be appreciated that today, business activities have become so complex that, in all strategic decisions, management must take into account the trends in the environment, that is, the economic, political, social, technological, and other related factors, at local, national and international levels. Such a development warrants creation of a well elaborated information system. In what is being referred to as an era of information explosion, a great deal of information is being generated in all disciplines and by all countries of the world. There is, therefore, a need for a country to have in place a system that is capable of handling this flow in its totality, analyse it, process and disseminate it to those likely to make best use of it for the benefit of their communities.

This investigation provides empirical evidences concerning the present state of the information system in Uganda. It brings to surface a number of weaknesses in the information flow between information sources and information users in Uganda. This study demonstrates the need to the develop of a comprehensive information system, built by using modern technologies and capable of supplying reliable, adequate, and timely data to all those concerned with the development of Uganda's industrial sector, more specially the small scale enterprises.

1.3 OBJECTIVES

1.3.1 General Objectives

To propose a plan, and programs and activities for implementing the plan for establishing an information support system for the industrial sector in Uganda, more particularly the small enterprises.

1.3.2 Specific Objectives

1. To identify the information needs of entrepreneurs, investors in business, government and parastatal organisations, associations, etc, concerned with industrial development.
2. To identify the existing information support facilities and to examine their contribution toward the growth of the industrial sector, especially the small enterprises.
3. To study the information flow paths among the enterprises and institutions concerned with development of industries.
4. To identify the components of an industrial information network and their respective roles/functions in facilitating information support to investors, industrialists, managers, entrepreneurs, planners, policy makers, and others in decision making positions.
5. To examine the national government policies on information, information systems and informatics so as to fit the proposed industrial information system into the overall development information policies and systems.
6. To develop a number of prototype databases for generating information products and services to support the small industries.

1.4 METHODOLOGY

In order to achieve the objective of this study, a combination of research methods were used. These included questionnaires, interviews, and literature survey.

1.4.1 Questionnaire

Three types of questionnaires were prepared to cover the following institutions: Information centres, research institutes, and manufacturing firms.

1.4.1.1 Information centres

More than thirty information centres were visited and information sought from them covered the following:

- Type of information service rendered;
- Total number of users and their categories;
- Information products available;
- The acquisition policy;
- Staffing at the centre;
- The level of use of information technology;
- The financial state of the information centre.

1.4.1.2 Research institutes

Over twenty research centres were visited. These included the various departments at Makerere University. Questions administered covered the following:

- Fields of research undertaken;
- Amount of money spent on research annually;
- Sources of the research funds;

- Beneficiaries of the research products;
- Origin of the research problems;
- Channels of disseminating results to users;
- Cooperation with other institutes within and outside the country;

1.4.1.3 Manufacturing firms

Over one hundred manufacturing firms were visited, of which, 90 per cent being cottage and small scale industries. Three persons were trained to assist in this exercise. While the research assistants covered the places around Kampala, the researcher visited those upcountry and covered the towns of Masaka, Jinja and Tororo. The information sought here included:

- Type of organisation;
- Problems faced by the firm, ranking them accordingly;
- Number of research centres known to the interviewee, those he/she has ever visited, type of problem at hand during the visit, and whether service was satisfactory;
- Number of information centres known to the interviewee, those he/she has ever visited, problem at hand during the visit, and whether service was satisfactory or not;
- Technology available in the industry;
- Channels or means of obtaining information on new technologies;
- The opinion of the interviewee about the present information system, especially with regard to manufacturing and business activities.

1.4.2 Interview Method

A number of public officers in charge of promoting manufacturing, science and technology were visited and interviewed. These included officers from the Ministry on Trade and Industry, National Council of Science and Technology, etc.

1.4.3 Literature Survey

Published as well as unpublished literature from the University library, institutional libraries and public offices were consulted; the aim being to gather information concerning the following topics

- Government's policies and plans concerning the industrial sector;
- Government policy towards research;
- Government policy towards information systems and centres;
- Working of scientific research centres;
- Information needs of industries, especially the small scale industries;
- Policies concerning technology transfer; and
- Working of information units, especially those relating to business and industrial information.

1.5 DATA ANALYSIS

The data collected during this exercise has been analysed statistically using some quantitative methods and, wherever possible, software, such as CDS/ISIS, SAS and Harvard Graphics have been put to use.

1.6 PROTOTYPE DATABASE

To illustrate the form and structure a viable industrial information system should take, a prototype database has been prepared. This is based on the use of modern technologies, computer technology in particular. The idea here is to demonstrate how computer technology can assist the information personnel to tailor his/her services to meet individual needs in an organisation/institution using the same data and information. Computer technology helps one to generate a wide range of information outputs of different kinds from a given database.

CHAPTER 2

BACKGROUND INFORMATION

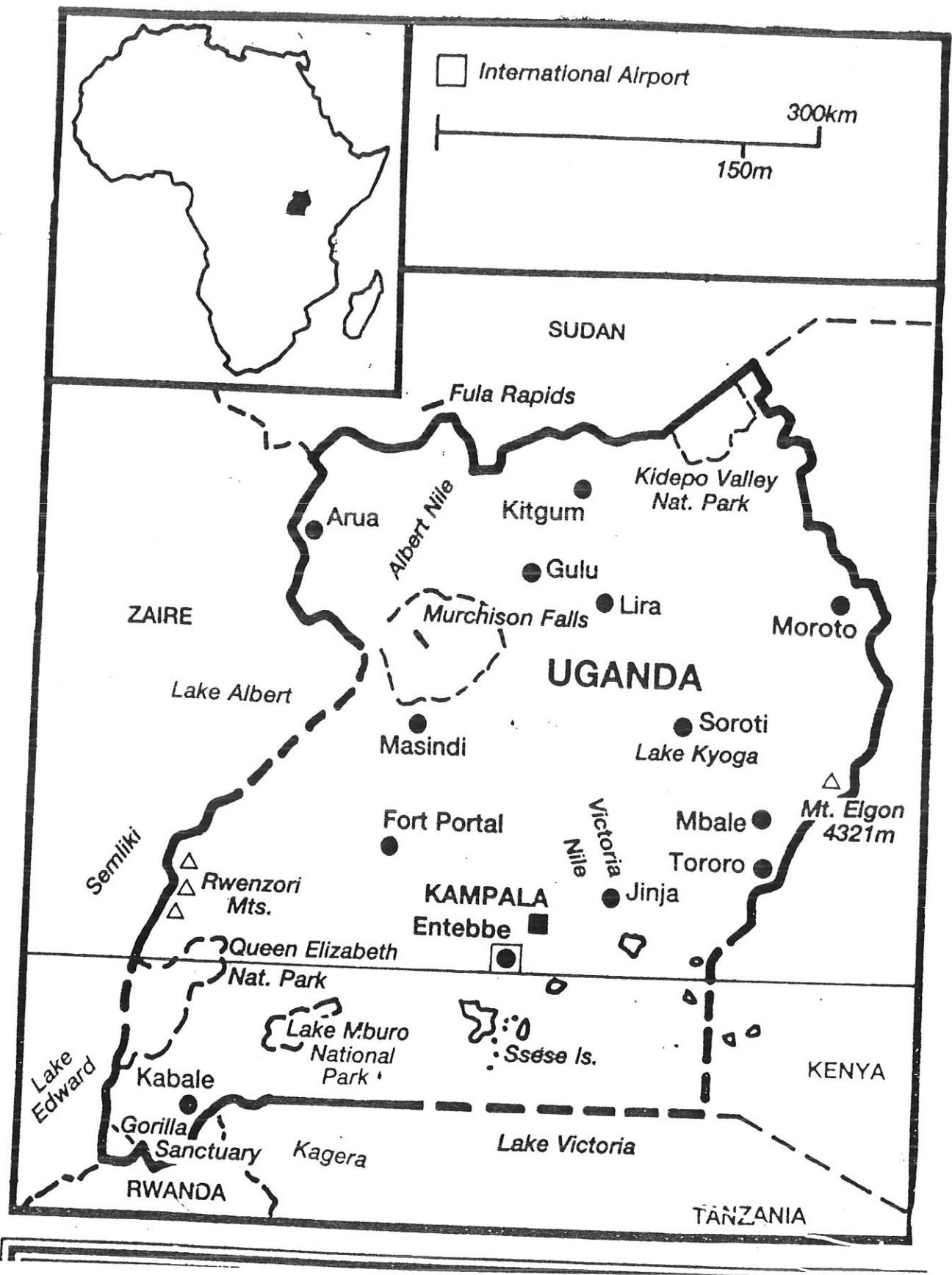
2.0 SCOPE NOTE

This chapter discusses Uganda's natural resources, political and economic history, etc. It gives a background information concerning the potential of the manufacturing sector in Uganda.

2.1 A BRIEF PROFILE OF UGANDA

2.1.1 Location

The Republic of Uganda is located in the heart of Africa, astride the equator, between 4° North and 1° South along longitudes 30° and 35° E. The total area of the country is about 241,000 sq km. including 44,000 sq km. of inland water. The country is landlocked and bounded by Sudan in the north, Kenya in the East, the United Republic of Tanzania in the South, Rwanda in the South-West, and Zaire in the West.



2.1.2 Topography

Uganda's altitude averages around 4000m, ranging from 620m around Albert Nile to 5,110m in the Rwenzori mountains, above sea level. A large part of the country forms part of the Central African Plateau.

2.1.3 Climate

Temperatures averages 22° C in most parts of the country, with rainfall about 1,250mm throughout the year. Annual rainfall varies considerably from region to region. The highest levels, averaging 2000mm, are in the Lake Victoria area. Average rainfall in the central region varies between 1,000mm and 1,500mm, with less than three dry months of the year. The north-east has very little rainfall, with average annual amounting less than 500mm. In the south, the dry season lasts from June to August and, in the north, from December to March.

2.1.4 Vegetation

Vegetation varies from dry and thorn-bush savannah in the west and north-east to the tropical rain forest and mid-forest in the South-West. In the stretched valleys of the highlands and Lake Kyoga area, papyrus swamps predominate. The high mountains feature cloud-covered forests, moss and bamboo thickets.

2.1.5 Population

According to the 1991 census, the population is about 16.6 million, with a crude birth rate of about 49 per 1000 and a crude death rate of 18 per 1000. The annual growth rate is over 3 per cent. Only 11 per cent of the population is classified as urban, with Kampala dominating the urban hierarchy. According to the 1991 census, the population of the main towns were as follows:

<u>City/Town</u>	<u>Population</u>
Kampala	773,000
Jinja	61,000
Mbale	54,000
Masaka	49,000
Gulu	42,000
Entebbe	42,000
Soroti	41,000
Mbarara	40,000

Uganda society is overwhelmingly rural, with the distribution of the population varying according to agricultural potential. Rural densities are generally less than 100 per sq km., and fall as low as 12 per sq km. in some areas, notably in the semi-arid Karamoja region in the north-east. The majority of inhabitants are

concentrated in the wide band around the shores of Lake Victoria, from the Kenyan border in the east to the Tanzania and Rwanda borders in the south, where rainfall is greatest and most reliable.

2.1.6 Education

At independence Uganda had one of the best educational systems in tropical Africa. Unsettled conditions and economic difficulties since early 1970s caused this sector to be run down. In 1991, more than 80 percent of children aged 6-12 years attended primary school, but only 12 per cent of this joined secondary and less than 1 per cent reached higher education.

There are (six) institutions of higher education, including Makerere University, Mbarara University of Science and Technology, the Islamic University at Mbale, the Catholic University at Nkozi; 5 technical colleges, 4 commercial colleges, 52 technical schools and 68 teacher training colleges. However, in most of these institutions, the physical condition and technical equipment for instruction are in a sorry state due to shortage of funds.

2.1.7 History and Government

Uganda has had an unsettled political history almost since independence in 1962. There have been seven changes of Government during the intervening 30 years, four of them achieved by force of arms and at a considerable degree of violence against the civilian population. The causes of this instability can be ascribed to ethnic and religious divisions in Ugandan society, but more particularly, to misguided policies of those in power whose sole aim appeared to be to cling to power.

With the coming to power of the National Resistance Movement (NRM) government in 1986, there has been a notable semblance of peace in the country. NRM follows a unique form of governance where a wide range of political allegiances are represented in a cabinet under what came to be referred to as broad-based governance. In this system, with the NRM is the ruling authority, there are four registered political parties: the Democratic Party (DP), the Uganda People's Congress (UPC), the Uganda Patriotic Movement (UPM) and the Conservative Party (CP), all of which have been absorbed into the movements Government. Presently, a new constitution is in the making.

2.1.8 International Relations

Uganda has a close link with the other two East African countries, Kenya and Tanzania. In 1967, the three countries signed an economic co-operation pact to form the "East African Community". However, due to political and economic strains in the region, the community could not survive beyond 1977. Since January 1994, there have been attempts to revive this cooperation and a "Treaty of Cooperation" has since been signed. Uganda is a member of The United Nations Organisation and many of its agencies. It is also a member of the Organisation of African Unity (OAU), and Preferential Trade Area (PTA).

OAU is committed to the creation of an African Common Market by the year 2025. PTA, on the other hand, aims at liberalising trade and encouraging cooperation and creating a common market among the countries of East, Central and Southern Africa. Other PTA member countries are Angola, Burundi, Comoro Islands, Djibouti, Ethiopia, Kenya, Lesotho, Malawi, Mauritius, Mozambique, Rwanda, Somalia, Swaziland, United Republic of Tanzania, Zambia and Zimbabwe.

Uganda also benefits from the Lome Convention which is a trade and aid agreement between the European Community (EC) and 68 African, Caribbean and Pacific (ACP) states, which guarantee duty-free entry to the EC for some commodities produced by the ACP states.

2.1.9 The Economy

When Uganda became independent in 1962, the economic prospects were extremely high. Good agricultural conditions supported a wide range of food crops in the subsistence sector, together with valuable cash crops led by cotton and coffee. Agriculture was the dominant economic activity, supplemented by the manufacturing sector which contributed about 7 per cent of the GDP. Between 1965 and 1971, the economy grew by about 4 per cent a year.

By mid 1980s, however, much of the national economy lay in ruins after more than a decade of civil strife and wars. In terms of human resources, there were a dramatic depletion of managerial and administrative talent. The entire population of Asian professionals and businessmen were expelled from the country. Also many of the educated elites left, mainly to look for greener pastures outside. Capital assets in agriculture, manufacturing and transportation were run down due to lack of maintenance or new investment. Between 1970 and 1980, GDP fell by one-fifth. Many commercial premises were looted, while manufacturing plants were operating at low capacity.

(Rehabilitation and Development 1987/88 - 1990/91)

2.1.9.1 Rehabilitation and Development

The economic programme the NRM government has for Uganda can be seen in her Rehabilitation and Development Plan (1987/88-1990/91) issued in May 1987; and the revised version of The Rehabilitation and Development Plan (RDP), covering the period (1990/91 - 1993/94). The long term goal of this plan is to create a viable and self sufficient economy. The launching of the programme was accompanied by currency reforms, tightening of budget and cost cutting, and promotion of a mixed and open economy. The programme focuses on reducing financial imbalances, improving producer incentives, promoting economic recovery, liberalising the exchange rate and trade regime, reconstructing transport and utilities, and strengthening public sector institutions.

GROWTH IN GDP AND THE INDUSTRIAL SECTOR

(percentages)

	1986	1987	1988	1989
Growth in GDP	0.3	6.4	7.2	6.6
Income per head	-	3.5	4.3	3.6
Value-added (Industry)	-	16.8	22.7	18.5
Industrial Production	-	16.0	24.0	17.0

Source: Budget Speech, 1990/1991

2.1.9.2. The Uganda Shilling

The value of the shilling has been severely affected by the political instability and economic deterioration after 1972. Between 1981 and 1986, the official exchange rate fell from Ush 78 = \$1 to Ush 1,450 = \$1, a reduction of almost 2000 per cent in only five years. In May 1987 a new currency unit was introduced with an effective devaluation of 76 per cent. The new Ugandan shilling (New Ush) had a domestic value of 100 old shillings (Ush). However, even at this new rate, the currency proved overvalued and a series of devaluations continued. By 1990, the dollar value of the shilling had fallen to as low as New Ush 1400 = \$1.

Since June 1990, the government legalised the parallel market by introducing a system of authorised forex bureaux. This led to an increase in the flow of hard currency into the country, mainly from remittances by Ugandans working abroad, and also from new investors. Coupled with the stringent policy on corruption and government expenditure, the gap between the official and parallel market started narrowing, with the shilling gaining value due to its increased demand. Since January 1994, banks and forex bureaux have found themselves stacked with hard currency which they are unable to sell due to liquidity problem.

AVERAGE EXCHANGE RATE IN NEW UGANDAN SHILLING PER DOLLAR

<u>Year</u>	<u>Ex. Rate/US\$</u>	<u>Year</u>	<u>Ex. Rate/US\$</u>
1983	1.54	1989	223.09
1984	3.60	1990	428.85
1985	6.72	1991	900.00
1986	14.00	1992	1400.00
1987	42.80	1993	1200.00
1988	106.14	1994	900.00

Source: IMF International Financial Statistics (except 1991-94)

For the sake of comparability, all exchange rates in the table are shown in terms of new currency.

Table 2.1

2.1.10 Agriculture

Agriculture dominates the economy of Uganda, accounting for 66 per cent of GDP, 90 per cent of export earnings and about 80 per cent of employment. The central, south and most of the southwestern, west and middle west regions receive plenty of rainfall throughout the year and continuous cropping takes place. In the north there is only annual cropping, and in the dry north-east only pastoralism. There is generally no shortage of land, as only a third of the estimated area of cultivable land is utilised.

The country generally is self-sufficient in food; any shortages recorded are normally the result of distribution problems. The main food crops are plantains (matooke), cassava, sweet potatoes, millet, sorghum, maize, beans, ground nuts, and sesame. However, most of these food crops are increasingly being grown for cash. Because of the narrow export base dependent mainly on coffee, effort is being made by government to encourage export of food crops. The main cash crops are coffee, cotton, tea, and tobacco.

2.1.10.1 Coffee

Uganda is a member of the International Coffee Organisation (ICO) with an export quota of about 4 per cent of the global quota. Today, this works out to about 2.3 million bags of 60 kg each, or 138,000 tonnes. Production capacity today is far in excess of this limit.

2.1.10.2 Cotton

Cotton was once the chief export crop but was overtaken by coffee in the 1950s. It is mainly grown in the central and south-eastern regions of the country. Output of cotton was badly hit by the disruptions of the 1970s, and in 1990 production was only 4,300 tonnes compared with the peak of 86,000 tonnes in 1970. Cotton production has continued to suffer from insecurity in the most productive areas.

In addition to being an export crop, cotton production supports the local textile mills, soap factories, animal feed processing plants and oil mills.

2.1.10.3 Tea

Tea is predominantly grown on large estates. However, production virtually ceased when foreign owners left the country in the 1970s. The return of the tea companies to the original owners in the 1980s plus the rehabilitation of the estates and re-equipment resulted in an increase in output. It is targeted that by 1995 tea should earn Uganda over \$10 million in export earnings.

2.1.10.4 Tobacco

This is produced largely in the West Nile region. In 1981, production of only 63 tonnes was reported. With improvement in security, rehabilitation of plants and increased producer prices, market production in 1990 increased to 3,322 tonnes. Earnings from tobacco exports in 1990 were worth \$2.2 million. The crop is processed and marketed by a foreign firm, British American Tobacco (B.A.T.) Corporation. Today tax revenue from cigarette sales is more than Ush 2 billion per month, which is almost 6 per cent of the total tax collected per month.

2.1.10.5 Sugar

Production from the three large commercial companies in 1968 was 152,000 tonnes. These were expropriated in 1972 and by 1980 the sugar industry had virtually collapsed. Uganda, one time a leading exporter of sugar in the region started importing all her sugar requirements. In mid 1980s, the factories were repossessed by the original owners in joint venture with the government. Rehabilitation has since continued and the country is now almost self sufficient in sugar production. It is envisaged that soon the country will be in a position to export sugar.

Considering the climate, soil conditions, and the abundance of unutilisable land, there is considerable potential in the agricultural sector for Uganda, an industry which presently, is virtually dominated by the peasants. What is most urgent today is to provide the farmer with better farm implements, hybrid seeds, fertilisers and value adding primary processing methods.

2.1.10.6 Livestock

The environment in Uganda provides very good grazing pastures for cattle, sheep and goats, most of which are indigenous breeds. About 95 per cent of the cattle in Uganda are owned by small holders. Attempts to introduce commercial ranches

in 1960 and 1970s were disrupted by the events of the 1970s. Attempts to increase the cattle population in the country by importing foreign breeds during the NRM government were also unsuccessful due to poor management skills. The strategy now is to encourage artificial insemination, disease control and ranch rehabilitation.

Pig and poultry production has increased considerably in recent years due to a strong demand for pork, poultry meat and eggs, respectively.

2.1.11 Forestry

Uganda has about 7.5 million hectares of forest and woodland. Timber is important as a source of charcoal for fuel and for construction. Biomass makes up 95 per cent of the national energy resources. Timber resources, however, are being subjected to severe pressure from cultivators, grazers, timber dealers, charcoal users, and fuel collectors. Demand for fuel wood in the country is increasing at a rate that far exceeds planting or regrowth. Output in 1990 was estimated at 16 million tonnes of timber and 190,000 tonnes of charcoal, compared with 14 million tonnes and 158,000 tonnes in 1985.

2.1.12 Fishing

Lakes, rivers and swamps cover nearly 4.4 million hectares, or 20 per cent of the country's area. Fishing is an important rural industry and fish contributes a high proportion of protein needs. About 90 per cent of the catch comes from Lakes Kyoga and Victoria.

2.1.13 Minerals

In the 1960s, contribution of minerals to Uganda's foreign exchange earnings was 30 per cent. The main minerals exported were copper, gold, tin, phosphate, columbite, among others. Other minerals, such as, iron ore, salt, sand and stone were consumed locally. The instability of the 1970s caused the industry to decline. Today cement and limestone are just produced for local consumption. Uganda is believed to be in possession of mineral deposits of importance, but in the absence of a comprehensive exploration survey, the extent of most of them is not known. The government seeks to revitalise small-scale mining in order to produce quick returns and promote employment, but funds have so far proved a hinderance. The most significant growth along these lines are quarrying for limestone and gravel, needed for road and building construction industries.

2.1.14 Energy Resources

In 1990, more than 90 per cent of Uganda's total energy requirements were met from sources other than oil and electricity, principally fuel wood and charcoal. Uganda's hydroelectric potential is estimated at 2,000 MW. Production at the only hydroelectric plant in the country, Owen Falls Dam, was until very recently 150 MW but now upgraded to 180 MW. Further expansion at Owen Falls is now underway, involving a new dam that will raise the capacity to 280 MW.

Total electricity sales in 1990 was 530 million kwh compared with 432 million kwh in 1989. It is estimated that only 3-5 per cent of the population have access to electricity. Many urban areas are without power supply while the major centres suffer from frequent interruption in supplies due to power shedding.

All petroleum products are imported. In 1990, 232,200 tonnes, worth US\$ 81 million were imported. The transport sector accounted for 70 per cent of the consumption.

2.1.15 Construction

Construction requirements such as cement, steel bars, corrugated sheets, angle bars, doors and windows are manufactured locally. The output, however, is very inadequate compared to demand. National Reconstruction is making large demands, not only for buildings, but also for roads, water supply and sewage. The current cement industry is very crucial in this connection. In 1990, cement output from the two factories in the country was about 5 per cent of the installed capacity.

In view of the abundance natural resources available in Uganda - unutilised fertile arable land, regular rainfall and mineral deposits, untapped energy resources - Uganda's economic potential, the industrial sector in particular, is very high indeed.

2.2 THE MANUFACTURING INDUSTRY

While agriculture remains the engine for growth in Uganda, the manufacturing sector has an important role in adding value to agricultural output, providing forward and backward linkages, facilitating import substitution and accelerating overall growth.

2.2.1 Trend

The development of the manufacturing sector in Uganda was stimulated during the 1960s through an import substitution policy to provide essential consumer goods. The sector was heavily dependent on imported inputs but, despite this, it developed steadily until the early 1970s. The manufacturing share in the GDP was about 7 per cent from the early 1960s, and up to the end of the decade its real growth rate averaged over 6 per cent per annum. It provided the domestic market with adequate supplies of basic goods, and there was some production for export, most notably in textiles and sugar. A downward trend in manufacturing output started after the expulsion of most foreigners from the country and nationalisation of their companies in 1972. In 1971, there were 50 medium and large-scale factories operating, but by 1981, 15 of these were completely idle and the capacity utilisation of the remainder was around 25 per cent. (Background to the Budget 1989/90). In 1970, 870 establishments in the small industries sector were operating: by 1981, only 418 could be identified and of these 162 had closed down and 256 were operating intermittently, as supplies and conditions permitted.

2.2.2 Structure

COMPOSITION OF THE MANUFACTURING SECTOR, 1989

BRANCH	NO OF EMPLOYEES (in '000)	NO OF ENTERPRISES
Food, beverage and tobacco	480	28,035
Textiles, apparel, leather and footwear	160	10,320
Wood and furniture	556	9,760
Paper and paper products, including printing & publishing	106	2,050
Chemicals rubber and plastics	47	1,610
Non-metallic mineral products	60	3,150
Iron and steel	7	635
Tools, hardware, metals and products (including machinery)	305	4,070
Other	2	30
Mining, including salt	23	2,920
TOTAL	1,746	62,555

Source: Ministry of Industry and Technology
Directory of Manufacturing Establishments, 1989

Table 2.2

The table above shows that firms producing food, beverages and tobacco employed about 45 per cent of the labour force in manufacturing industry, followed by textiles, apparel, leather, and foot wear employing 16 per cent. Other important sub-sectors are wood and furniture, and metal products.

SIZE DISTRIBUTION OF THE MANUFACTURING SECTOR, 1989

No of Employees	No. of enterprises	Total no. of employees
1-5	328	1,430
6-10	525	4,150
11-20	378	5,191
21-35	213	5,858
36+	285	45,926
TOTAL	1,728	62,555

Source: Ministry of Industry and Technology
Directory of Manufacturing Establishments, 1989

Table 2.3

As it is evident from the above table, a larger number of the enterprises have fewer than 10 employees. These account for almost 50 per cent of the number of enterprises recorded in the directory; only 16 per cent of companies employ more than 36 workers. The table also shows that the larger companies dominate in terms of total employment, providing almost 75 per cent of jobs.

2.2.3 Geographical Distribution

According to the Directory of Industries published by the Ministry of Planning and Economic Development (MPED), 1983, the majority of the enterprises (excluding agro-industries) are located in the Buganda and Eastern regions.

Buganda Region	
Kampala	330 firms
Mpigi	69 "
Mukono	38 "
Eastern Region	
Jinja	65 "
Tororo	63 "
Nothern Region	
Lira	14 "

2.2.4 Composition

Most manufacturing in Uganda is based on the processing of agricultural commodities, including cotton, coffee, sugar and food crops. Large-scale industries include textiles, tobacco, beverages, wood and spare products, construction materials and chemicals. Small-scale manufacturing is dominated by the clothing industry, but it also includes sugar and maize mills, furniture making and general workshops.

INDUSTRIAL PRODUCTION

	Units	peak year	1980 Total	Ratio of 1980/Peak year (Percentage)
Spirits	'000	1973	910.0	34.0
Beer	m. litres	1973	45.6	12.0
Cigarettes	b. sticks	1974	2.0	0.6
Fabrics	m. sq.mtrs	1970	49.6	7.5
Soap	'000	1966	14.9	0.4
Matches	'000	1971	64.0	2.8
Steel Ingots	'000	1970	24.8	1.9
Cement	'000	1971	205.1	4.9
Paints	m. litres	1974	1.9	0.1

Source: Uganda, country economic memorandum
(World Bank Country Study, 1993)

Table 2.4

INDUSTRIAL BRANCHES CLASSIFIED ACCORDING TO
CAPACITY UTILISATION, 1988

<u>High(above 50 %)</u>	<u>Medium(20-50%)</u>	<u>Low(below 20%)</u>
Cigarettes (86)	Curry powder (48)	Ball-point pens(18)
Soft drinks (61)	Steel doors/windows(49)	Jerry cans (16)
Soap (51)	Processed milk (44)	Toothbrushes (15)
	Beer (44)	Hoes (14)
	Tableware (43)	Gunny bags (13)
	Animal feeds (39)	Corrugated boxes(13)
	Chalk (38)	Biscuits (13)
	Bricks and tiles (34)	Acetylene gas (12)
	Wheat flour (27)	Motor batteries(11)
	Garments (26)	Sugar (5)
	Cotton/rayon fabrics(20)	Coffee roasting (5)
	Cables/conductors (21)	Paints (5)
		Cement (3)

Source: Ministry of Planning and Economic Development
Background to the Budget, 1989/90

Table 2.5

2.2.5 Ownerships

Public enterprises dominate the large manufacturing sector, accounting for 70 per cent of its employment. The bulk of the private sector consists of small and medium enterprises.

Until recently, 45 public enterprises were involved in manufacturing. The government owned 100 per cent of the shares in a third of these enterprises. The rest were joint ventures with private partnership or mixed ownership, though the government was the majority shareholder in most of these as well. Private partners of joint ventures and other mixed companies are principally Western foreign companies, such as, British American Tobacco Co.(B.A.T.), Chillington, Mitchell Cotts, Pepsi Cola, and some Asian groups such as Mehta, Madhvani and Patel.

Public enterprises dominate in the domestic resource-based industries, such as, production and processing of sugar, tea, meat, dairy products and cement products. They also account for a large number of manufacturing plants in metal works, textile and garment, beverages, paper and paper products.

Among the large enterprises, there are very few foreign-owned manufacturing companies that are in full possession of their assets. Among these are Berger Paints, BATA Shoes and Lonrho. Fully private joint ventures are very few and these include General Machinery. Large Ugandan-owned private companies are also few and have developed only recently. The largest groups are Sembule Steel Mills, Mulwana Group of Companies and Mukwano Industries, etc.

The small-scale private enterprises have been the main producer of consumer goods during the period of civil strife and economic instability, mainly using inputs from locally available resources.

2.2.6 Government Policy

Government policy concerning the manufacturing sector is expressed in the Rehabilitation and Development Programme (1987/88 - 1990/91) and its revised version (1990/91 - 1993/94). It may be summarised as follows:

1. Rehabilitate existing industries, especially those producing essential goods for local consumption;
2. Create self-sufficiency in basic consumer goods;
3. Restructure the sector in a manner consistent with the Governments's goal of building an independent and self-sustaining national economy;
4. Harness the existing indigenous scientific capability;

5. Lay the foundation for the development of other industries in line with Uganda's resource base; and,
6. Broaden the industrial base by establishing enterprises which utilise local materials.

2.2.6.1 Strategy

In keeping with the above policy, the government's strategy is to:

1. Continue the rehabilitation of the projects contained in the development plan;
2. Rationalise the role of the parastatal sector in industry, with the objective of selling off or winding up those enterprises which have no commercial potential;
3. Improve management in those public sector companies where mismanagement remains a problem;
4. Expand the coverage of the Open General License to include additional industries, both large- and small-scale; and,
5. Promote exports of industrial commodities, especially to the PTA and other African States.

2.2.7 Performance of the Public Sector

For a period of four years beginning with 1988, 60 per cent of public enterprises operated at a loss. Average capacity utilisation was around 30 per cent. Financial flows from the public sector to enterprises in 1986, 1987 and 1988 were about 9.4 per cent, 10.1 per cent and 4.0 per cent of total government expenditure respectively.

2.2.7.1 Possible Solution

As a response to the dismal performance of the public enterprises, the government strategy concerning reform include the following measures:

(Rehabilitation and Development 1990/91 - 1993/94)

1. To define a clear policy regarding government participation in the public enterprises sector based on a delineation of the Government's role vis-a-vis the private sector in specific areas of economic activity;
2. To implement a defined programme of divesture and liquidation of industrial public enterprises;
3. To target management and technology assistance to retained industrial enterprises;
4. To prepare a comprehensive programme for rationalising the rest of the public sector enterprises;
5. To strengthen the Ministry of Finance and Economic Planning and the Ministry of Commerce and Industry to monitor the progress under reform polices.

2.2.8 The Private Sector Development

The thrust of the NRM government policy has been to create an enabling environment for the efficient and rapid growth of the private sector. This is being implemented by bringing into force the Investment Code 1991 and the setting up of the Uganda Investment Authority. The work of these institutions is to provide a mechanism for attracting private investment, both local and foreign, and promoting the private sector. (A Guide to Investing in Uganda, 1993)

2.2.8.1 The Investment Code

The investment code incorporates four main features to investors, particularly foreign investors:

1. Protection of the interests of investor in the case of compulsory acquisition. This guarantee is invested in Uganda's membership to the World Bank's Multilateral Investment Guarantee Agency (MIGA).
2. Liberalisation of policies concerning foreign exchange remittance.
3. Fiscal incentives, such as tax holidays.
4. Reduced bureaucracy, via the "one-stop-shop" investment centre, where information and advice on and to process applications for investment licences and certificates can be obtained by the investor swiftly and efficiently from the Uganda Investment Authority, an autonomous body.

CHAPTER 3

INFORMATION AS A PRE-REQUISITE TO EFFICIENT MANAGEMENT OF INDUSTRIES

3.0 SCOPE NOTE

This chapter discusses the role of information in modern management and the information needs of investors and entrepreneurs at various levels of a project cycle.

3.1 BACKGROUND INFORMATION

Since the coming to power of the National Resistance Movement (NRM), the government has been broadcasting programmes about the economy on the national radio and television services under the code name "Economic Desk". Here, economic policies and programmes are articulated for the benefit of the masses. Since 1991, this programme has picked on "Privatisation" and "The Investment Code" as its key topics. One listening to this programme would be tempted to believe that with the Investment Code in place, all problems concerning private investment in Uganda are now solved.

3.1.1 The Uganda Investment Authority (UIA)

The Investment Code, as already noted, created a new body, The Uganda Investment Authority (UIA). UIA serves as a one stop investment centre for prospective investors in Uganda, particularly the foreigners. Among its various functions are:

- To provide information on matters relating to investment in Uganda;
- To assist potential investors in identifying and establishing investment projects in Uganda;
- To receive applications for investment licences from investors intending to establish business in Uganda;
- To secure, on behalf of investors, licences, authorisations and permits required to enable any approval granted by the Authority.
- To promote, facilitate and monitor investment in Uganda.

The creation of the Investment Code, the Uganda Investment Authority in particular, was indeed a landmark in the promotion of investments in Uganda. It replaced a system that was archaic, and which, in many ways, served to undermine rather than promote investment, and thus industrial growth in the country.

3.1.1.1 Weakness

UIA as it operates to day has no information bank worth the name. Its information sources are just government publications and study reports that have been prepared by different agencies in the country for a wide range of purposes. Many of these publications were designed for centralised planning purposes, that is, top-down planning systems. This kind of data puts emphasis on aggregate data rather than detailed information at micro-level. For investment purpose information cover what would be considered as the most elementary information. It is unsatisfactory because it does not provide the detailed information required to make a critical and analytical assessment of the viability of a given project. (Sundaram, 1991)

Many manufacturers talked to during the course of this research expressed pessimism about the quality of information supplied by UIA, especially with respect to its completeness, pertinence, timeliness, ease of use and reliability. UIA was created to promote investment and, hence, its information service is designed to give a picture about the investment climate in the country so as to attract investors. Consequently, some of the information supplied by UIA can be misleading as it may not be providing all the facts about a given situation. Many investors have fallen victim of this by running into complications during or after project implementation. One good example was the ordeal of Mr H. Damani, a returnee Asian. (The Monitor, Friday Nov.12 - Nov 16, 1993).

Mr Damani is one of Uganda Asians who were expelled from the country in 1972. He returned to Uganda recently to regain his citizenship, settle, and engage in the business of manufacturing. He had in mind the idea of setting up three plants, an Electronic Assembling Plant, a Vimto Beverage Factory and a Transport Company. He wanted these projects to be in close proximity of each other so as to ease on the management problem.

With the assistance of UIA, Mr Damani was allocated a piece of land at Nakawa, 3 kms from Kampala, on Jinja Road. He paid all the dues required of him by the City Council including the fee for the plot, and thereafter, embarked on the project. His plans were however squashed when another firm, Kampala Bottling Company, shot up to claim ownership of the land. The case ended up in court where it dragged on for a period of eight months. In the end, Damani's supplier was forced to sell off the plant equipment he had procured for the project. Although Damani was eventually allocated a new piece of land, this was not very much to his liking as it was too small to accomodate the three projects. Finally, Damani settled on constructing a Vimto Beverage Factory only. Damani claims to have lost over Pound Sterling 200,000/- on this venture. This problem arose because there is at present no effective information system concerning land allocations and ownership in the country. Cases of a similar nature that can also be ascribed to lack of effective information systems are found almost in every trade in Uganda.

While Damani could seek redress from a the Uganda courts, there are many investors, specially the small-scale investors who may not have the wherewithal to pursue the matter through such channels to its conclusion. There is a long list of public projects that are presently bogged down as a result of squabbles among the parties concerned. Although it may not be proper to attribute all the problems of this sort to information alone as the element of mismanagement resulting from complex bureaucratic procedures and red tape, political interference, negligence and incompetence of the managerial teams is also quite apparent in Uganda's case, nevertheless, the information problem has had a good share in a number of these cases.

This is not to say that there are presently no information systems in the country concerning industries and business. There are quite a number of such institutions, and these will be discussed in the later chapters. The idea of bringing up Damani's case was just to demonstrate how lack of an effective information system in a country can undermine the effort that may be expended by the goverment to promote industrialisation.

According to Dilip Shukla of Berger Paints, the issue of tax exemption on machinery and raw materials as proclaimed by the Investment Code is at the present meaningless in Uganda in view of the heavy cost an investor has to incur in order to gather adequate and reliable information. This is because of lack of

a viable system that is able to supply timely, reliable and adequate information to investors.

3.2 ROLE OF INFORMATION IN MANAGEMENT

Management in the industrial setting has two main objectives:

1. To produce goods and/or services which the society wants or demands at an acceptable quality and price;
2. To optimise the use of resources.

3.2.1 Equipment and Machinery

For a long time, management depended on the flair, intuition and skill of the individual managers. It was basically an accumulation of experience largely through trial and error. Today, there is a gradual shift from this approach, mainly due to the increasing use of machines and technology in the production processes by the manufacturing firms. Machines are preferred because they are more efficient than people, especially in the performance of routine, repetitive and formalised tasks. They are more consistent, work faster and work for relatively longer periods of time. However, machine technology can be very expensive and a big drain on the resources of a firm. Secondly, it changes very fast with new models appearing on the market one after the other and within a very short period of time. Some of these new models are indeed an improvement

on the working and efficiency of the those they replace, thus, making the existing technology obsolete. Manufacturing being a competitive business, a firm that wants to succeed in business can not afford always to ignore the changes in technology, the problem of scarce resources notwithstanding. Thus every manufacturing firm today need to be careful when choosing the technology to be adopted for its production purposes. Some research/survey, however, need to be carried out so as to select technology that is appropriate and which will be able to withstand the test of time, at least for sometime.

3.2.2 Information Technology

Some technologies today have had and continue to have considerable impact not only on manufacturing processes but also on the management of enterprises. An example here is information technology, (IT), ie. the integrated applications of computer technology, telecommunication technology, electro-optic technology, and reprographic technology. IT is commendable in its capability to capture, store, process and communicate data and information in an organisation. Computer technology is able to handle large quantities of data and information which it is able to process efficiently.

Many organisations would desire to apply computer technology in their daily activities. However, this may not be possible for many due to the constraints

involved. Nevertheless, it should be acknowledged that in a competitive environment a firm that may be able to exploit a new technical know-how, even a little faster or earlier than others, can gain a formidable lead in the industry. It is, thus, advisable for all firms to keep a close watch of the developments in technology, especially in those areas where they have an interest, including IT. This can only be realised by having in place an information system that is able to satisfy such demands.

3.2.3 Social Factors

It should be noted that changes in technology can be associated with a number of social factors. They may lead to displacement of labour, thus compounding the problem of unemployment; or they may call for installation of a wide range of new equipment by the firm, causing the firm to incur additional expenditure; or may call for retraining of workers in the use of the new technology. Training itself is a cost to a firm. However, training cost aside, workers have a tendency of demanding pay raises after training. In view of the possibility of such complications, a firm needs to make a careful assessment of the pros and cons of the issues associated with a given technological development, including the social factors. Such an exercise calls for research which in most cases will need to be supported with information.

3.2.4 Resources

Today, successful management is no longer weighed against output alone but the effective use and conservation of scarce resources, namely, human, material, machine, money, knowledge, etc. Flair alone is not adequate in steering an enterprise to success. On the contrary, the management concept, as it is understood today, takes into consideration the economic, psychological and sociological factors affecting the performance of persons and organisation. Consequently, decision making calls for a wide survey of the possible range of effects and implications, and alternative solutions to the problems perceived. This is necessary so as to minimise the risks that may be involved in implementing a decision. However, this kind of management is not possible unless the industry has in place an information system that is capable of providing the relevant and timely data and information at affordable cost to those charged with the responsibility of decision making.

3.2.5 Globalisation

"Free trade market" has a close association with globalisation of markets. In all countries, including developing countries, the argue to access foreign markets even for previously non-traditional export crops is gaining increasing momentum. Almost every producer today yearns for hard currency to enable him/her procure

the imported in-puts, including equipment and machinery. This new development, therefore, calls for improved information systems at every level of production, including the peasant level.

It is now the policy of Uganda government to promote the horticultural industry for export purpose. Individuals as well as institutions are being encouraged to engage in the export of fruits, vegetables, flowers, etc. Such a move, however will necessitate increased supply of information to farmers, etc. about marketing, packaging, cargo handling, etc., of horticultural products.

3.2.6 Node in a Cluster

Manufacturing firms find it not only healthy but inevitable, to interact with a wide range of other firms and institutions. For example, a firm engaged in food processing has to consider its operations in relation to various other commodity and service industries, such as the following: the chemical industry; the equipment and machinery producing industry; the packaging industry; the transport industry; the hotel and restaurant industry; the agricultural industry; the power and energy supply industry; the water supply industry; etc. This interrelationship amongst industries make one firm just a node in a cluster. In such a cluster, every firm/node must keep itself aware not only about the developments in the other related industries, but also the regulatory and other

measures affecting them. Such a situation calls for an information system that would keep the firm abreast of the developments.

3.2.7 Industrial Complex

It is becoming increasingly necessary to view business-industry infrastructure in a wider social perspective. Promoters need to take cognizance of the socio-economic complexes that are associated with industrial development. Such complexes include:

- Natural resources - industrial complex;
- Environmental - industrial complex;
- Education and Research - industrial complex;
- Social welfare - industrial complex;
- Defence - industrial complex;
- Government administration - industrial complex; and,
- Non-government Organisation - industrial complex.

The inference here is that any industrial planning exercise would usually call for formulation of multi-objective goals and programmes that will ensure industrial development without putting too much strain on other institutions. In such an integrated programme, it is not uncommon for the enterprise to demand information of different kinds and often originating from different sources.

The availability and application of information can influence the business-industry complex in a number of ways: (Neelameghan 1992)

1. The range of choices for the industry is widened;
2. The movement from one area of operation to another, or the process of diversification, is made easier and will entail a lesser degree of risk.
3. The time lag between identifying a problem and finding a solution can be reduced. This is because information helps to provide the possibility of structuring of a problem in a way that is conducive to finding a solution;
4. The quality of staff function improves, especially when there is a greater certainty of productive and gainful results;
5. An improved information network will permit experts dispersed geographically to interact and share experiences;
6. It provides a channel through which a quick feedback is made to the firm by the consumers about its policies, decisions, products and services;
7. It helps to improve a firms' competitive position by making it aware of the need to develop new products and/or services to satisfy the changing demands of society;
8. It enhances the perceptivity and creative ability of the managers and other staff of a company by providing them with an analytical framework of the major factors influencing or likely to influence their work;
9. It permits an increase in productivity in an industry by minimising unnecessary and unintended duplication of effort.

3.3 INFORMATION AS A RESOURCE

Planning is essentially the optimal allocation of available or mobilisable resources to the components of the system. Information is a vital input in a planning exercise and a pre-requisite to the optimal allocation of such resources. The value of information rests in the fact that it can programme and/or control the production and utilisation of all other physical resources.

3.4 INFORMATION AS AN INDICATOR OF A PROGRESSIVE FIRM

Information is a measure of a company's contribution to social growth. Today, the concept of "profitability" of a company is seen beyond the mere cost accounting of company profits. Instead, the measure of a company's contribution to society is seen in the quality and quantity of knowledge and information it is able to create and make available for the advancement of society. The policy of deliberate search for ideas on new products, processes, techniques and tools is considered to be the main characteristic of a progressive and dynamic enterprise. In the United Kingdom, for example, a checklist of twenty four characteristics of technically progressive firms include the following: (Neelameghan 1992)

1. Provision of good information sources and services to employees;
2. Readiness to seek knowledge and information from external sources;
3. Willingness to share knowledge - technical, commercial, and managerial;
4. Willingness to acquire knowledge on license or enter into joint ventures;
5. Deliberate surveying of potential ideas.

3.5 CASE STUDIES

Information as a resource in a production process has characteristics different from those of other resources. It is indivisible, and thus, it is not always possible to establish easily the contribution of a given unit of information to a production process. Secondly, its returns are not always immediate, taking long time to become visible or to be felt. For these two reasons, it may prove difficult sometimes to come up with concrete examples of the impact information may have in a production process. This is particularly true with developing countries where documentation of processes is inefficient. Nevertheless, some newly

industrialising economies of the countries, such as, Mexico, India, etc. have been able to present cases which may be worth noting here. In Mexico, for example, it was observed that as result of an inquiry from the Mexican Institute of Foreign Trade, the Technical Information Service (TIS) of the National Council for Science and Technology (CONACYT) of Mexico provided information on the techniques of production, machinery required and other details to establish a small company to manufacture brooms. In about two years after the establishment of the company with about twenty persons it has been able to export goods worth about US\$ 28,000 annually. (Neelameghan 1992)

In Uganda, a new crop "Vanila" has been recently added on the export list of the non-traditional crops. For decades vanilla has been growing wildly. It is alleged that the current information about vanilla in Uganda originated from the one of the archives in Europe. During colonial days, vanilla was noted by some European to be growing in Uganda. This was during their brief stay in the country. They documented this finding, but never had a chance to come back to explore the possibility of making it a commercial crop. The documents about vanilla in Uganda found their way to the National Archives in Europe.

This information was recently accidentally discovered by some scholars who passed it on to some interested groups in Europe. These came to Uganda and started encouraging the peasants to start growing vanilla. Since then, vanilla has been added on to the list of the non-traditional crops and is proving to be one of the most prosperous of such crops. Vanilla is likely to go a long way in helping the peasantry to diversify their incomes and helping the country to earn foreign exchange.

3.6 INFORMATION NEEDS

The preceding account was basically an attempt to affirm the usefulness of information with regard to management of projects, more specifically, manufacturing projects. It will be useful to pinpoint here the information needs in a production system. This could be best done by tracing such needs right from the the time an idea to enter the industry is conceived to the management of an operational enterprise.

3.6.1 Information Users

Basically, information is so called information when it is able to trigger an action with the receiver, or when it has a surprise value. An information system cannot exist in a vacuum; instead, it is always associated with another institution. The usefulness or relevancy of an information system is measured according to the amount of satisfaction it brings to the target group. It is, therefore, always necessary for an information system to identify its user groups properly. In the industrial setting, user groups of the information systems can be categorised as follows:

1. The aspiring or potential investors. These may be new investors in the industry, or old timers but looking for new opportunities to create new lines or expand old ones.
2. The entrepreneurs who, against all the odds, must try to succeed in their daily routines, by adjusting to changes as and when they occur.
3. The planners and decision makers in government who are concerned with national industrial development as an integral component of national economic development; and finally,
4. International, regional and non-government organisations who render a helping hand to those involved in manufacturing through resource grants or technical assistance.

The information needs of these groups can be classified into three types:

(Neelameghan 1992)

1. The environment (social, political, regulatory, cultural, technological, etc) as it relates to the project at hand.
2. Feasibility or pre-investment studies
3. Managerial activities during operation.

3.6.1 Environment Scanning

Environment refers to the external factors to which an enterprise may have to relate its activities. Such factors include, political, social, technological, regulatory, economic, business, and other factors. These can influence the working of an enterprise directly as well as indirectly; determining its size, location, range of activities, etc. Thus the scanning of the environment becomes part and parcel of the management of an industrial project. Scanning enables investors as well as the entrepreneurs to take note of their obligations and responsibilities well in advance, but more important it will give them a chance to identify opportunities as well as problems and thus take necessary action in advance. It should be noted here that environment cuts across a wide range of levels, such as, international level, national level, industry level or unit level. The influence of a number of the environmental factors are examined in greater detail below. (see also fig. 3.1)

3.6.1.1 Political factors

Political decisions and conditions usually influence the performance of the manufacturing sector of a country. Among the issues that every investor would have to monitor include:

- the stability or durability of the government in power;
- the attitude of the government toward business;
- the institutional process of succession in the country;
- the competing political interest groups, their ideologies and philosophies;
- the possibility of armed conflicts in a country with other countries;
- the possibility of social disorder and social unrest;
- the international and regional alliances to which the country may be aligned, etc.

These issues must be monitored regularly by an intending investor and, any change taking place therein and the likely impact on the firm/ industry analyzed.

3.6.1.2 Social Factors

Social conditions encompass a wide range of issues which can have far reaching effects on the operations of a manufacturing firm in a country. Among such factors are the demographic structure of the country, the expenditure pattern of the population, labour conditions, education, etc.

3.6.1.2.1 Demography

Quite often investment decisions, such as, choice of the industry, its location, size etc, are greatly influenced by factors, such as, population size, its distribution, age structure, ethnic structure, occupational, and economic structure; etc.

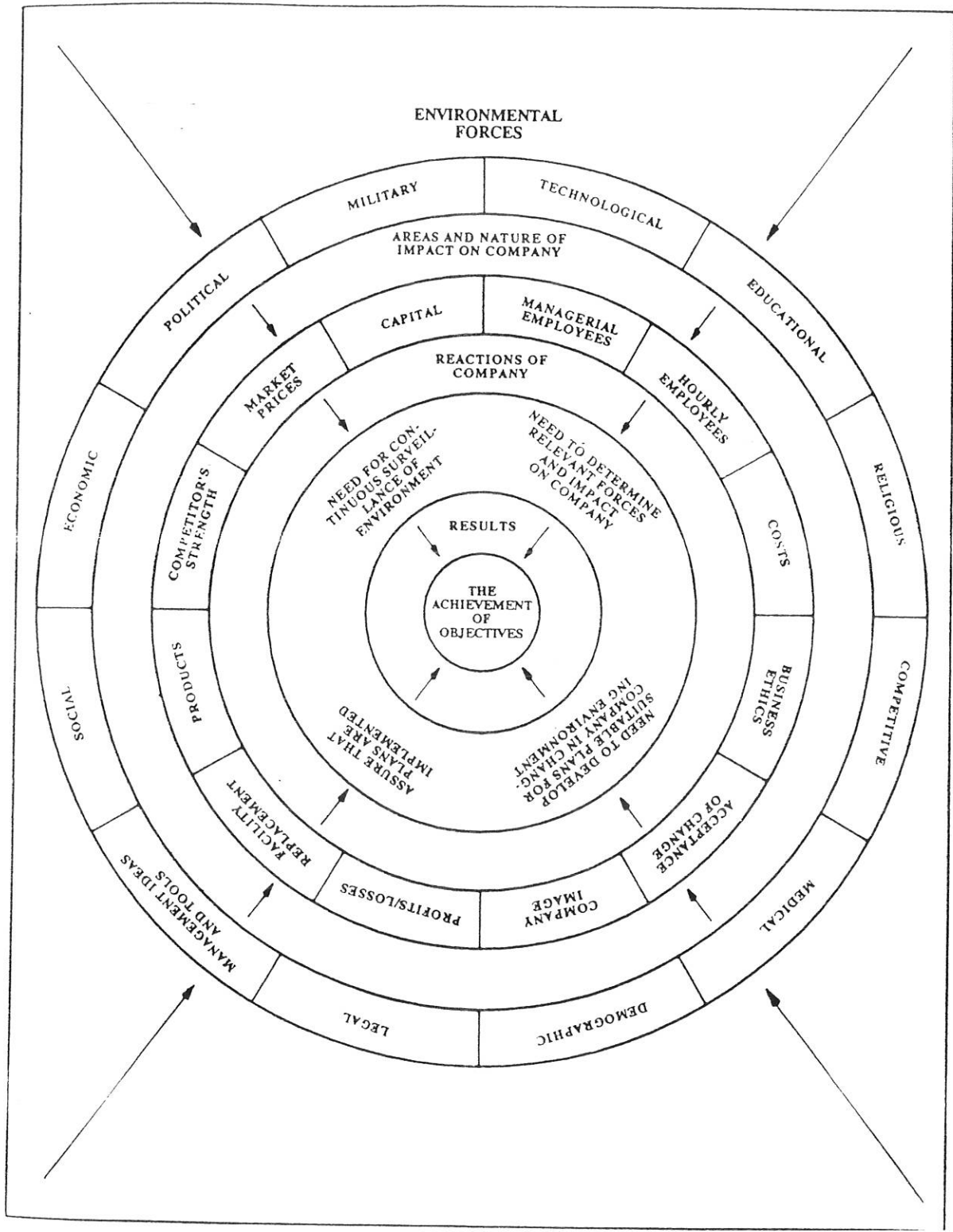
3.6.1.2.2 Expenditure pattern

The important aspects to examine here include the government projects under consideration, the acceptability of substituted and synthetic products; choice between public and private consumption of goods and services; choice between domestic and foreign goods; emphasis on things like education, health, entertainments, leisure, etc. The information system should be able to continuously monitor these factors and changes thereof so as to assist promoters as well as investors with relevant information.

3.6.1.2.3 Human resource development

Education is a matter of great interest to the promoters as well as managers of industries. Most industries are fond of keeping track of the developments in the education field, taking note of the number of trained scientific and technical personnel available in the country, changes in the curriculum in the academic and technical training institutions, the intake and output of such collages and institutions, the research programmes being undertaken at the universities and other research centres; etc. This information, if kept up-to-date, can be of great importance to planners, decision makers and investors, in the formulation of programmes and policies concerning the industrial sector. Individual firms, in their attempt to diversify the production activities or modernise the techniques, will need to know the availability of technical and managerial personnel of appropriate quality in adequate numbers. Further, as part of human resources development programme, the firms would need to know the training facilities available, consultants and experts available and related matters.

FIG.3.1 ENVIRONMENT



3.6.1.3 Legal and Regulatory Factors

It is usually through the regulatory conditions that the attitude of the government toward business, manufacturing in particular, is expressed. The information that is of vital importance to a firm include:

- Industrial licensing policy of the government;
- Import restrictions and regulations;
- Regulations relating to monopoly and restrictive trade practices;
- Anti-trust laws;
- Differential taxation measures;
- Tax holidays, tax exemptions, and tax remissions;
- Regulations concerning allocation of foreign exchange, especially with regard to import of capital goods and strategic raw materials;
- Price controls;
- Labour legislations;
- Availability of credit guarantees;
- Availability of priority sector credit; etc.

This information, must not only be maintained up-to-date, but the information system must provide as much background as necessary to each element for the understanding of the rationale for the measure. It should also systematically take note of the nature of the impact of each element is creating so as to serve as feedback information.

3.6.1.4 Economic Factors

Every investor would be interested to monitor the trend in the economy or the way it is being managed. Thus, any information relating to the performance of the economy would be of interest to those involved in manufacturing. Such data and information should cover, among other things:

- Changes in the growth of production and income;
- Changes in income distribution;
- Extent of mobilisation of resources for development;
- Changes in the national savings ratio to Gross National Product;
- Efficiency of utilisation of existing financial resources;
- Compatibility of the social institutional framework with development;
- Population growth problems;
- Relative emphasis on development in national planning, vis-a-vis, for instance, defence;
- Stability of the currency and confidence in the future rate of savings;
- Economic measures on imports;
- Efficiency of management of balance of payments;
- Internal consistency and compatibility between policies on development and those on finance;
- Level of industrial production;
- Degree of capacity utilisation in individual industries, etc.

3.6.1.5 Business Conditions

Besides the economic indicators listed above, there are issues that may be of concern mainly to an individual firm or industry. Amongst these are:

- Growth and profitability of end-user industries;
- Changes in the technical characteristics of the products required by the end-users;
- Nature of the competition offered by the public sector units as supplier of competing products;
- Degree of capacity utilisation in the industry to which the enterprise belongs;
- Nature of the competition offered by the private sector and in the private sector with respect to quality, price, and effort for development of new goods and service through research and development.

The need to maintain such information by the information system for the benefit of the enterprise can not be overemphasised.

3.6.1.6 Technological Developments

Matters relating to technology change are of concern to almost every manufacturer; more so to those engaged in such technologies as electronics, semi-conductors and chemicals. The issues that require scanning here include (Neelameghan 1992):

- Research and development activities in progress;
- New products being announced;
- Patents taken or applied for;
- Technology transfer arrangements;
- Survey of indigenous technology;
- Technology import;

- Adaptive technology;
- Appropriate technology; and,
- New management techniques and ideas, and problem solving and decision making tools and techniques; etc.

3.6.2 Feasibility Studies

Before one embarks on implementation of a project, it is always advisable, first, to make a pre-investment study so as to gather in advance, information on issues that should assist in determining the type of production unit appropriate for the purpose, given the environment and the means available. Such a study would usually involve examining issues like plant size, raw materials, human resources, standards, marketing, banking facilities, machinery and equipment, etc.

3.6.2.1 Plant Size

Information will be needed about a suitable size plant, given a number of parameters of the production programme. Similarly information will be needed on the possible locations, bearing in mind the utilities and amenities that are necessary for the operation of the plant;

3.6.2.2 Raw Materials

Information is needed about the possible sources of raw materials, the terms and conditions of the different supply sources, the mode of transportation to be used, the possibility of fluctuations in price of raw materials, their possible causes and, the effect of these on the manufacturing.

3.6.2.3 Imported Inputs

The procurement of imported inputs, whether they can be obtained through the local dealers or agents, and if so, make a comparative study with regard to the terms and conditions of the suppliers; in the absence of local agents, the possible alternatives such as obtaining such supplies from outside the country.

3.6.2.4 Taxes

Issues relating to taxes and duties that may be levied by the concerned authorities on requirements like raw materials, machineries and other inputs.

3.6.2.5 Human Resources

The skills and expertise that may be required and their availability; the salary scales and other benefits and allowances to be paid to the different categories of staff; the recruitment sources, such as, academic institutions, technical colleges, employment agencies, etc.; and, the need for and possibilities of apprenticeship, on-the-job training, training within industry, etc.

3.6.2.6 Quality Control

Standards to be conformed to with regard to raw materials, machinery and equipment, construction materials and final output, bearing in mind the national and international requirements.

3.6.2.7 Marketing

The distribution and promotion channels available locally and as well internationally.

3.6.2.8 Credit Facilities

Supplementary sources of funds available, their terms and conditions, methods of application for credit, etc. Such supplementary sources may include industrial finance corporations, commercial banks, state finance organisations, refinancing corporations, etc.

3.6.2.9 Permits and Licences

Information will be needed on the relevant rules and regulations and procedures concerning procurement of government permits and licenses with regard to construction of buildings for factories, import of machinery, equipment and other materials, power supply, water supply, collaboration with foreign firms, purchase of know-how, receiving assistance from abroad or from international organisations, etc.

3.6.2.10 Support facilities

This may include issues like tariff concessions, special financial benefits for particular industries, government purchase and procurement schemes, admission to industrial estates, assistance provided by state trading corporations and institutions, etc.

3.6.2.11 Plant location

In many cases, the success of a project may be influenced by its location. Information required about location include. (Neelameghan 1992)

- Total land area required;
- Land required for other purposes, such as constructing the houses for employees;

- Land available for expansion;
- Soil conditions;
- Sale price;
- Land assessment value;
- Improvement cost;
- Waste disposal facilities;
- Power supply;
- Water supply;
- Distance from main highways;
- Distance from waterways;
- Distance from rail loading facility;
- Distance from airport;
- Local transport facilities, etc.

Again, site location, should also take into account the availability of skilled and semi-skilled personnel in the area for a variety of jobs, such as, electricians, millwrights, machine maintenance and repair, technicians for manufacturing operations, etc. Similarly, it should take into account the demographic factors. Demographic information with respect to locality may cover issues like, total population, the density of population per sq km., the structure of the population with respect to age, occupation, sex, etc. This information will be necessary in planning production and the type of outputs.

3.6.3 Information sources

Information for pre-investment studies is available from a wide range of documentary sources, such as, pamphlets and handouts, some of which are distributed by the institutions or agencies themselves. It may also be obtained from studies carried out earlier for different purposes. However, information on land sites may be hard to find in conventional reference materials. It is usually kept in a raw form, and can only be found with bureaux like survey offices, land record offices, town planning. One way of bring such information under control by an industrial information support system is by maintaining a database of the profiles of such institutions.

In Uganda, for example, all information on land issues falls under the ambit of the Ministry of Lands and Survey. Kampala City Council (KCC), on the other hand, is in possession of the details concerning land under its jurisdiction, and the same applies to other municipalities in other parts of the country. Likewise, The Ministry of Finance and Economic Planning is responsible for much of the data and information about the economy; the Ministry of Energy generates, collects and uses information and data about energy issues in the country. State corporations like the Electricity Board, Water Board, etc., also generate, collect and use data concerning their respective areas, including future plans.

3.6.4 Managerial Work

Today, manufacturing is becoming increasingly competitive as many countries move towards a free market system. The main force behind the free market system are the international lending agencies who through the popular Structural Adjustment Programme, demand countries to open up their markets by removing any form of protectionism. Consequently, many local manufacturers today find themselves competing with foreign products and firms even for the local market. Foreign competitors in the developed world are at an advantage over the local manufacturers in that, they have been in the business for a long period of time, they have access to better technologies, they operate in a more developed and improved environment with skilled personnel, better communication systems, etc. For a local manufacturer to survive without protection in such an environment, he/she has to enhance his efficiency a great deal.

Efficiency in managerial work, largely depends on the ability to make correct decisions at the right time. Correct or gainful decisions depend on the timely availability to managers of reliable and adequate information on the many factors they need to take into account when planning, programming or implementing an activity. Hence, for a manufacturing firm to be able to survive free market competition, it must put in place an efficient information system. Managerial activities in a manufacturing enterprise usually evolve around processes, such as:

product design, product planning, inventory control, product control, scheduling, industrial engineering, plant engineering, plant maintenance, quality control, purchasing, traffic and transport control, housekeeping routines, etc. In each of these processes and activities, the decision making element is apparent as there will always a need to make a choice from among several alternatives.

3.6.4.1 Product Design

Product design is mainly concerned with coming up with a product design that should be simple in nature but having an appeal to customers. This involves selection of materials to give a fair balance between the physical properties of the product, its appearance, cost and workability. It also involves selection of an appropriate manufacturing process that should yield optimum quality at the lowest cost possible. These two activities may involve research by the firm; gathering information about consumer preferences or assembling it from the different sources where it is already available; and, scanning and evaluating the technological developments concerning design that are taking place in other regions. This information is usually available in technical bulletins and a wide range of other documentary sources. Product design, thus calls for an information support system to an enterprise or a group of enterprises so as to organise the information products from where such information may be obtained.

3.6.4.2 Product planning

Product planning include, a number of activities, such as, ensuring an uninterrupted flow of materials so as to avoid delays and wastage in production runs; striving to achieve increased productivity; ensuring optimum utilisation of materials, machinery and personnel; maintaining an equilibrium between employment and production, etc. These processes, among other things, may call for; sales forecasting; determination of production requirements to achieve the forecast; determination of requirements of raw materials, machinery and equipment; determination of personnel requirements; etc. While some of these activities may be accomplished through the personal intuition and flair of the managers, much more can be achieved if this is augmented with research through collection of data and its analysis. Such an undertaking call for a manufacturing process that is supported with an information system. This is necessary to help in organising the documents, developing databases, and providing access various information sources, whether local or foreign.

3.6.4.3 Production Control

Here, it is necessary to maintain information about the manufacturing capacities of the unit; manufacturing loads; detailed schedule; operations to be done and their sequence; special tools required; standards of production; scheduling, that

is taking note of specific and special demands of customers regarding delivery, and the alternative delivery schedules acceptable; demand analysis concerning data for finished products; and sales forecast. Some of this information may be collected through surveys, or analysis of various information sources; and any information obtained need to be reviewed and updated from time to time.

3.6.4.4 Industrial Engineering

This is mainly concerned with the study of production methods, motion, job evaluation and wage incentives, materials handling, specification of production equipment and machinery, and process engineering. Here, both internal and external information sources can be useful. Internal sources will provide management with information on the status of activity within firm, while external information will bring to the attention of management the relevant technological and market developments taking place around the globe.

3.6.4.5 Quality Control

Quality control is concerned with inspection, testing, and implementation of the policy for ensuring quality and standards from the stage of design of product, through procurement of raw materials and equipment and operations, to finished goods. The process thus involves a number of activities and operations. Those

involved must be supplied with up-to-date information about the developments within the enterprise as well as outside it. Information on these technical matters can be obtained from technical bulletins and similar documents. Other sources may include technical counselling from industrial service institutes, workshops, seminars, training courses, etc.

3.6.4.6 Common Services

Information needs here may include testing and quality control laboratories, workshop facilities, such as, electroplating, forging, finishing, etc; equipment available on lease or hire purchase, eg. inspection equipment, mobile workshop services, etc

3.6.4.7 Market Information

Market information pertinent to manufacturers include:

1. Competitive position of products, ie. data available from comparative study of competing products for evaluation against the market situation, and the products being produced or those proposed for production;
2. Customers, i.e. their variations in composition, priorities, and causes of customer dissatisfaction if any.
3. Market size, i.e. size and trend in size, type and number of orders, and demand for new products.
4. Sub-contracting, i.e. information on prospective demands for parts, components, and products of the larger industrial enterprises through sub-contracting exchanges.

3.6.4.8 Research facilities

Information is needed on research facilities available such as:

- Testing of raw materials and products;
- Local substitutes for raw materials imported from abroad or brought from other parts of the country;
- Utilisation of by-products and waste products;
- Finding solutions to manufacturing process problems, equipment problems, etc.

3.6.5 Information Sources

Some of the information can be obtained from directories, periodicals and ad hoc reports of the different institutions. It can also be obtained through correspondence and personal visits with appropriate institutions and agencies.

3.6.6 Institution Profiles

The types of information enumerated above can be associated with one institution or the other. Indeed, it is the work of the information unit to bring this information together, process it and organise it in the form convenient to the clients. However, it is also advisable for the information unit to keep a complete and up-to-date catalogue of all its possible sources in form of a database of institution profiles, indicating the type of service rendered by each institute and

the terms and conditions under which it is rendered. Below is a checklist of some of such institutions and agencies, an Industrial Information System could be most advised to consider (Neelameghan 1992):

- All industrial organisations at national, regional and local level;
- All industrial service institutes;
- All local, state, regional and national documentation and information centres for industrial development;
- Banks and financial institutions;
- Industrial extension centres and services;
- Ministries dealing with industrial development, commodity import-export questions, industrial licensing, financing of industries, etc;
- Regional and state bureaux of industries;
- Census offices;
- Productivity-cum-training centres;
- Chambers of commerce;
- Factory inspectorates;
- Quality control, standards and certification bodies;
- Export promotion councils and committees;
- Small industries product marketing centres and marketing societies;
- Sub-contracting exchanges;
- Management and marketing consultants;
- Industrial and business information centres and databases;

Universities, colleges, institutes of technology and other centres for training of technical personnel;

Employment bureaux and exchanges;

Industrial research institutes and institutions supporting cooperative research and sponsored research;

Economic, socio-economic and industrial studies and development centres, and survey centres;

Mass media offices;

Commercial attaches in embassies, both foreign embassies in Uganda, and on Uganda's embassies abroad;

The United Nations system including the specialised agencies, such as, UNIDO, ILO, UNITAR, UNDP, etc.;

Technical assistance and service programmes for SSI available from international and regional non-government organisations;

Bilateral technical aid programmes and agencies;

Special libraries and community information centres;

Relevant databases and on-line services.

CHAPTER 4

SMALL SCALE INDUSTRIES (SSIs) IN UGANDA: NATURE SCOPE, AND THE RELEVANCE OF THE INFORMATION COMPONENT

4.0 SCOPE NOTE

Chapter two presented small industries as the core of manufacturing activity in Uganda. This chapter will discuss the problems besetting this sector, proposals that have been made by several studies relating to the promotion of SSIs in Uganda, and the role of the information component.

4.1 HISTORY OF SSIs IN UGANDA

Traditionally, SSIs have always been a feature of Uganda's economy. Long before colonialism, people in Uganda used to manufacture in their cottage industries articles that were important in their daily lives. These included spears, knives, clothing "bark cloth or mbigo", pottery products, beer brewing, ghee, etc. The advent of colonialism in the late 19th century introduced into the country new and superior products from Asia and Europe. The local inferior products gave way to the imported products leading to almost a virtual collapse of the indigenous technology and skills.

4.1.1 Uganda Development Corporation

The first attempt to rejuvenate the SSIs in modern times goes as far back as 1950s when the colonial government formed the Uganda Development Corporation (UDC). More than one hundred small firms profited from this scheme.

(Kakaire-Menya, 1992)

4.1.2 Management Training and Advisory Centre

Another serious attempt to promote SSIs was after independence in the mid 1960s when the then government set aside 100 acres of land at Ntinda 3 kms from Kampala, on Jinja Road. With assistance from UNDP and UNIDO, the government opened an institute, the Management Training and Advisory Centre, to serve as training centre in management for SSIs entrepreneurs. Unfortunately, the centre fell victim to the turmoil that engulfed the country in the 1970s. It was abandoned by the funding agencies and in the end it ceased to exist except by name.

4.1.3 Uganda Small Scale Industries Association

With a feeling that they were being marginalised by government, entrepreneurs in SSIs came together in 1979 to form a pressure group. This gave birth to an

association known as Uganda Small-Scale Industries Association (USSIA). Since then, USSIA has continued to dominate the affairs of small-scale industries in Uganda. More will be said about USSIA in chapter five.

4.2 DEFINITION OF A SMALL-SCALE INDUSTRY

Small Scale Industries (SSIs), have been defined differently by different people using a wide range of characteristics. These include: the volume of income generated, number of workers employed, volume of machinery and equipment in use, value of assets, value of fixed productive assets, value output, etc. Unfortunately, none of these criteria, used singly, can give us a satisfactory or a mutually exclusive definition of a small-scale industry. One of the criterion most commonly in use is the number of people in employment.

4.2.1 Kenya

In Kenya, for example, a firm with less than 50 employees is by the official definition an SSI. However, there are many large firms in Kenya today, who, by switching to capital intensive methods are now able to employ far fewer than 50 people.

4.2.2 Philippines

Philippines has come up with two definitions, one based on size of employment and the other on assets: (Neelameghan and How 1991)

<u>Enterprises</u>	<u>No of Employees</u>
Micro industries	Less than 5
Cottage "	Less than 10
Small "	10 - 99
Medium "	100 - 199
Large "	200 and above

Philippines: Department of Industry and Trade

<u>Enterprises</u>	<u>Assets</u>
Micro industries	< P50,000
Cottage "	P50,000 - P500,000
Small "	P500,000 - P5 Million
Medium "	P5 Million - P20 Million
Large "	Over P20 Million

Exchange Rate is P23 = US\$1

Philippine: The National Economic Development Authority

4.2.3 Uganda

In Uganda, there is no statutory definition of a small-scale enterprise. What we have in place are definitions that emanate from banking institutions who find it necessary to work out some definitions to guide them in their dealings with this sector. One such definition, for example, takes an SSI as an enterprise in which the total value of productive assets is less than US\$ 200,000 in case of traditional industries, and less than US\$ 300,000 in case of modern industries; modern industries here being industries engaged in engineering works, such as foundries, etc. Within this definition, however, banks make a distinction between SSIs and the very small industries, such as, artisan and cottage industries. Artisan and cottage industries are referred to as enterprises where the value of the total productive assets is less than US\$ 10,000.

It should be pointed out here that the term "Small Industries" is here used in a broad sense to include both manufacturing and industrial service firms. The distinction here is that the former covers those enterprises involved in processing of inputs or raw materials, in order to produce an output. The later, on the other hand, are firms that facilitate manufacturing. Among these, are repair services, testing services, etc.

Several studies have been carried out in Uganda concerning SSIs, the latest being the APT/USSIA SSI Survey of 1993. According to this study, the general basic statistics of an average SSI in Uganda are as follows:

Capital Assets in Production Equipment	US\$ 3,324
Annual Turnover	US\$ 10,404
Total Average Number of Staff	7.9 persons
Average Growth Rate Per Annum	.56 persons
Average Productivity per SSI Worker P.A	US\$ 1,308
Average Cost of Job Creation in SSI	US\$ 410

It is quite evident from the above that most SSIs in Uganda fall in the category of "Very Small Industries". In fact the APT/USSIA study revealed that a majority of SSIs in Uganda have capital assets not exceeding US\$ 2000, and labour force not exceeding 6 persons.

4.3 CHARACTERISTIC FEATURES OF SMALL SCALE INDUSTRIES

Small Scale Industries are characterised by the following features:

1. Management is usually in the hands of one person or a few individuals. It is very flexible, informal and usually dependent on the drive of a few individuals.
2. The range of products is limited, partially due to the problem of capital and limited skills.
3. Management structure is very simple, devoid of a number of administrative procedures found with big enterprises

4. Industries are very vulnerable to change, be it social, economic or technological. A small change in the environment can have far reaching effects on an SSI in Uganda.
5. SSIs also usually have a very low level of risk tolerance

4.4 IMPORTANCE OF SSIs

The role SSIs can play in the development of a country, a developing country in particular, cannot be overemphasised. This is due to a number of factors:

4.4.1 Capital

SSIs generally require relatively smaller capital to initiate. They have consequently proved a source of employment for a large number of people who would otherwise be unemployed, or remain underemployed in the agricultural sector.

4.4.2 Saving

An SSI is a strong catalyst in enhancing the propensity to save by the public by offering an alternatives to agriculture which are attainable and within the reach of many.

4.4.3 Primary processing

SSIs offer opportunities to peasant farmers to enhance the value of their produce by making it possible for them carry out some of the primary processes at or near the farm. Their produce is consequently made to fetch a higher price on the market, but more important, they are saved the trouble of transporting a bulky produce which has little value.

4.4.4 Balanced Development

They present a channel through which developing countries can pursue the goal of balanced development. Large industries, because of their nature, tended to centralise development around a few nodes in a country, thus, giving rise to a number of social problems. Concentration of industries gives rise to the following problems, among others:

- a. Creates unbalanced development between regions in a country;
- b. It leads to unequal distribution of income within a country;
- c. It gives rise to unwanted migration of people from less industrialised regions to the more industrialised ones.

For countries with limited resources, it is through SSIs that such developments may be checked.

4.4.5 Training Ground

SSI in many developing countries serve as a training ground in entrepreneurship to many people. A good number of the successful indigenous businessmen and industrialists of today started on a small scale. The knowledge and skill gathered through this association paved the way to their becoming successful entrepreneurs.

4.4.6 Flexibility

SSIs are very flexible and can respond very easily to changes in the environment. One may here recall the causes of the Depressions in 1870 and 1930s which largely were due to the gigantic plants that could not respond rapidly to change when the need to do so arose. However, SSIs are also more easily affected by environmental changes. They do not have the wherewithal to withstand the impact as it is possible for the larger industries.

4.4.7 Linkages

Through forward and backward linkages, SSIs can provide for development of an integrated industrial structure in a country. On one hand, they provide a fertile ground in the consumption of the products of the larger industries around them;

and on the other, they can be a source for supplying some of the needs of the large firms.

4.4.8 Integration

SSI integrate fully with the local community. In many cases, their raw materials are supplied by the local community, they employ the local labour force, and lastly, their product or service is tailored mainly to satisfy the needs of the local community.

4.4.9 Diversification

SSIs are usually in a position to diversify easily and successfully their products to satisfy individual customer needs, many times using the same tools.

4.4.10 Market Size

They have no conditioned level of output. They can thrive comfortably with small orders as well as big orders. Thus, they have been able to survive irrespective of the change in the size of the market.

4.5 ECONOMIC PLANS

In view of the factors narrated above, many governments, presently, give much attention to the development of the SSI sector in their economic plans.

4.5.1 India

The Government India, for example, since 1953, has identified the small scale industry sector as a key weapon to combat the problems of unemployment and balance of payment deficits. (Kibuuka 1981). The government of India has been invested heavily in this sector by providing supportive services such as money lending institutions, training institutes, etc. in addition to adopting of favourable legislations. This has indeed paid dividend, with SSI now contributing over 40 per cent of the country's export value, India is now recognised as a power house in SSI technology.

4.5.2 France

France, though a developed country, gives a lot of support to SSI in the national economic programmes. Presently, the country has over 850,000 SSI establishments, constituting about 38 per cent of the total business units in the country. SSIs in France currently employ over 2.4 million people, or 11 per cent

of the total work force, and generate over 480 billion FF, which constitutes about 12.1 percent of the Gross Industrial Production. (Neelameghan 1992)

In Japan, 95 per cent of the industrial units are in the SS sector. Other Asian countries, such as, Malaysia, Singapore, Taiwan, China also give considerable attention to SS sector which now contribute to a sizable portion of their GDP and exports. The same is true in a number of Latin American countries.

4.5.3 Developing Countries

In a majority of the developing countries SSIs constitute almost 95 per cent of the industrial establishments, and employ between 45 and 85 per cent of the industrial work force.

4.6. SMALL SCALE INDUSTRIES IN UGANDA

According to APT/USSIA Survey, 1993, SSI is the second largest employer in Uganda, second only to agriculture. The sector employs 14 per cent of the total workforce, and contributes to 20 per cent of the Gross Domestic Product (GDP) which is again second only to agriculture. Presently, 80 per cent of the manufactured goods in the country are produced by the SSI.

4.6.1 Categories of Small-Scale Industries in Uganda

SSIs in Uganda may be categorised as follows:

The Urban-Based SSIs

The Urban-Poor SSIs

The Rural Artisans

The Rural Women

The Disabled

The Youth

It should be noted here that these distinctions are important because each of the groups has its own peculiar characteristics and problems.

4.6.1.1 The Urban-Based SSI

This is a broad mix of operators engaged in a wide range of trades, crafts and services for the low income groups in urban and rural areas. They are mainly dominated by men although the role of women cannot be underrated. Men engage in activities like repair workshops, carpentry, joinery, blacksmithing, metal works, foundries, brick making, shoe making and repair, grain milling, construction work, etc. Women, on the other hand, engage themselves largely in cottage type industries, such as, handloom and tailoring, edible oil extraction, bakery, distilling of alcohol and mobile restaurants.

A majority of the urban SSIs in Uganda are a product of the fifteen-year period of anarchy in the country, from early 1970s to mid 1980s. (New Vision December 6, 1993) During this turmoil, as wages and salaries from regular employment declined in purchasing power, and as many of the activities in industries came to a halt and others continued but intermittently, many workers from civil service, and industrial units had to seek employment elsewhere. Many opted for self-employment where they set up small enterprises of their own matching with their already acquired skills. A number of motor repair, radio repair, carpentry, etc., workshops thus mushroomed mostly around the major towns. Presently, such enterprises dominate in all major towns of Kampala, Jinja, Mbale, Tororo, etc.

4.6.1.2 The Urban Poor

This consists of a group of men and women who have acquired some industrial skills through training or apprenticeship. They, however, lack the capital and premises to engage in productive SSI activities. They are the type one finds with a pair of spanners and screw drivers by the roadside waiting for a repair job as a vehicle breaks down in their midst. Others roam from house to house seeking opportunity to repair electrical fittings, blocked sewage pipes, broken furniture, leaking saucepans, etc. Many try their hands on all sorts of things. Many of such men end up as habitual thieves, and the women as prostitutes.

4.6.1.3 The Rural Artisans

These are fellows usually found in village and rural trading centres who have acquired industrial skills through tradition, apprenticeship, or even training, but are in rural areas after failing to gain a footing in the major towns. They practice farming but along with farming practice their industrial skills on a part-time or call basis.

Rural artisans render valuable services to the mass of the rural poor by finding use to raw and agro-based materials which would otherwise remain as scrap. Their activities are quite comprehensive, including carpentry, masonry, leather curving, pottery, hand loom, black smithery, simple repair of tools and bicycles.

4.6.1.4 The Rural Women

Apart from farming and general home care, many rural women are engaged in a wide range of income generating activities of an industrial nature. Women's major responsibility as producers and reproducers call for their time being well co-ordinated so as to enable them handle several activities at the same time. Consequently, such activities are mostly those of the cottage type where the women can combine residence, farm, kitchen and the project in a single environment. These include, for example, tailoring, bakery, beer brewing, bee

keeping, food processing, handicrafts, grain milling, poultry, dairy farming, piggery, etc. By their sheer numbers, and contribution to agricultural production and general welfare of the family, rural women in Uganda have been an important target group in the SSI development.

A number of problems, however, face the womenfolk in Uganda. These include:

1. They are immobile as it is not possible for them to move to other places outside the home area due to the numerous family responsibilities they have to shoulder simultaneously.
2. A lot of their time that could be saved is spent on the farm or in the kitchen using unproductive methods for lack of simplified technology in tillage, harvesting, processing, ie, shelling, winnowing and milling; storage; fuel and water supply.
3. They are the victim of a number of negative cultural biases.
4. They lack property rights and cannot therefore borrow money to start business.
5. Rural women lack bargaining power as their projects are small and scattered;
6. They lack any technological skills thus produce poor quality products;
7. Specialisation is low thus inferior products;
8. They lack market knowledge and techniques as they relate to packaging and advertisement;
9. They operate in a village setting where purchasing power is low and transport difficult.

4.6.1.5 The Youth

This group consists of school and university leavers. They are currently the most hit with the problem of under-employment and unemployment as they join the labour market in large numbers. It is becoming increasingly necessary for these young people to become self-employed through launching of small enterprises. Unfortunately, the education and training system in Uganda have tended to train people to become employees rather than self employed. It is not uncommon these days in Uganda for professionals in engineering, veterinary science, agriculture, etc, to look for jobs anywhere irrespective of the basic qualifications required. These young people have some basic skills and are very talented.

4.6.1.6 The Disabled

The disabled in Uganda are involved in a variety of SSI activities such as furniture making, shoe making and repair, textile and garment, woodcraft and handicrafts, etc. Special centres have been established in various places for the disabled, such as, Kireka. One thing that is notable about the disabled in Uganda is that they are able to pick up skills remarkably fast. There is need to assist the disabled to develop their skills by which they may be able to generate their own income so as to avoid considered a problem to others.

4.6.2 Potential of SSIs in Uganda

In spite of all the problems facing SSIs in Uganda, the industry has a very high potential. This is due to a number of factors: (Kizito 1981)

4.6.2.1 Agriculture

The National Resistance Government, since coming to power in 1986, have given agriculture a high priority aiming at increasing productivity. The result of this effort has been increased output in both traditional and export crops. SSIs here will have three roles to play:

1. The increased incomes to the farmers will mean increased purchasing power and thus higher demand for products produced by SSIs.
2. SSIs will be required to supply inputs to the growing agricultural sector.
3. The sector will be required to provide value added services, such as primary processing.
4. SSIs can manufacture simple machinery as well as spares, in addition to providing repair services.

4.6.2.2 Cattle

Uganda has a large cattle population which is likely to increase as the economy and stability continue to improve. SSIs will be in position to exploit the situation through supply of inputs like animal feeds. There will also be increased demand for its services especially in the treatment of animal products like dairying and leather.

4.6.2.3 Household Consumer Goods

Presently, Uganda imports most of her household requirements, ranging from footwear, garments, paper products, packing materials, etc. SSIs are capable of manufacturing a number of these products using local materials, or by adding value to the imported materials.

4.6.2.4 Landlocked

Uganda being a landlocked country, it is more advantageous to transport the raw materials rather than the finished goods. Thus, some of her most industries are protected from external competition

4.6.2.5 Infrastructure

The transport infrastructure outside the leading towns in Uganda is very poor, after several years of complete neglect. This has a dual advantage to the SSIs in the rural areas. First, they are protected from the competition that could arise from the larger industries in the cities and towns; secondly, it makes primary processing of some products such as dairying almost imperative. Presently, in many remote areas in the country, milk is being processed into ghee by the SSIs.

4.6.2.6 Abundant Land

There is an abundance of unutilised land in several regions which receive ample rainfall. These areas have proved to be very suitable for raising of the new crops being introduced in the country and which are suitable for industrial processing. Among such crops are sericulture, fibre products, fruits, vegetables, etc.

4.7 GOVERNMENT POLICY TOWARD SMALL ENTERPRISES

As already pointed out, presently, there is no institutional framework in charge of promoting SSIs in Uganda. What we have is a department in the Ministry of Trade and Industry, the Division of Small Scale Industries.

4.7.1 The Division of Small Scale Industries

This Division has the following responsibilities :

1. Licensing of Small and Medium Scale Industries;
2. Coordinating the assistance schemes and financing of Small and Medium Industries;
3. Appraisal and evaluation of projects in the Small and Medium Scale sector;
4. Provision of advisory services

SSIs above the size of US\$ 100,000 in plant and machinery are required to obtain industrial approval in the form of a license. However, those smaller in size may simply register with the local authority linked to the Ministry and without having to seek a license as such. It is presently under consideration to establish Industrial Promotion Offices in every district to undertake the functions of registration of all industries including SSIs, and planning for the assistance in key areas such as raw materials, training and credit. Due to these anomalies cited above, there is, at present, no complete record of existing SSIs in the country. According to the Ministry of Trade and Industry records, there were 878 SSIs registered with the Ministry in 1989; but a survey carried out the same year revealed that only 257 were operational:

INDUSTRY/PRODUCT	UNIT REGISTERED	UNITS WORKING
Food manufacture	225	71
Textile, weaving and leather	166	47
Wood and wood products	74	13
Paper and paper products	80	30
Chemical, rubber and plastics	174	48
Non-metallic mineral products	38	7
Basic metal industries	4	4
Fabricated metal products	105	33
Other manufacturing industries	10	4
Personal service	2	0
TOTAL	878	257

Table 4.1

In 1989, USSIA had a total membership of 1000 SSIs, however, various estimates put the total number of operating units between 4000 and 6000. With the improvements so far recorded in the economy since 1986, it may be safe to assume that the total number of SSIs in the country has increased significantly.

4.8 DISTRIBUTION

Majority of SSIs in the country are concentrated around Kampala and Jinja districts. It should be remembered that the two districts have been the traditional industrial centres in Uganda for over thirty years. They have better infrastructure in communications and trading ports. All the major industries in the country are located here; and they enjoy a closer proximity to government offices and, therefore, a larger consumer market.

4.9 PROBLEMS FACED BY SSI IN UGANDA

I have already enumerated the general problems characterising SSIs, in the developing countries. In addition to those already mentioned, those which are of peculiar importance to Uganda are mentioned below.

4.9.1 Technical and Managerial Skills

Many of the SSIs in Uganda are being set up by people without any formal training in the choice of products, technology, marketing or finance.

Unfortunately, there is no assistance from the government to SSIs in these matters.

4.9.2 Capital

Banks in Uganda have been less inclined to deal with SSIs in providing credit or loans for the following reasons:

- a. Most banks consider SSIs as a high risk area due to their lack of managerial and technical skills.
- b. Banks find small loans very unproductive and expensive to administer, compared to large loans.
- c. A number of SSI are unable to provide collateral security.
- d. SSIs lack proper premises, or, they are not secure enough to ensure proper security of machinery.

Consequently, majority of SSIs are being set up using personal savings of the proprietor, or with the help funds borrowed from relatives and friends. Due to lack of adequate capital, many SSIs remain under-capitalised and therefore, are unable to stock the appropriate machinery.

4.9.3 Exposure to Modern Technologies

There is a general lack of exposure to modern production techniques. Hence, production methods in SSIs are basically manual resulting in uneven and poor quality products. This problem is most evident in the metal fabrication, woodworking and plant fabrication industries.

4.9.4 Accounting

Most SSIs have no proper systems of accounting or exposure to simple rules of production planning and cost evaluations.

4.9.5 Argue to Excel

Majority of SSIs are contented with operating at very low volumes and the argue or motivation to excel is almost non-existent.

4.9.6 Premises

SSIs lack the resources to construct proper premises. Majority of them are located in dilapidated premises, and some in open air. In many cases, the premises serve as both work places and living quarters. There has been no organised effort from the government to establish industrial estates as it has been done in Kenya and Tanzania. (Chepkwnoy, 1993)

4.9.7 Marketing

Despite the increasing demand for their products, SSIs in Uganda lack a marketing infrastructure. They have no showrooms or display centres for their products, no transport to move their goods to market centres, or take part in exhibitions. Exhibitions themselves take place very infrequently and irregularly.

4.9.8 Links with other Institutions

There has been no proper linkage between SSIs and large industries in the country, or government departments, state corporations, etc. Government bodies and parastatals could provide a sizable market to SSIs products; also subcontracting with the large industries would guarantee SSIs a steady market for their products.

4.9.9 Training

Training offered in technical institutes in the country is not fully geared to the needs of SSIs. Technical institutes and colleges continue to follow foreign syllabi such as those offered in technical colleges of the United Kingdom. The problem here is that these syllabi aim at imparting just a reduced version of specialised knowledge offered at the high technical institutes. They ignore the fact that unlike big industries where you have a number of specialised personnel, SSIs are a one man business. The manager, therefore, need to have a fair grasp of the specialised knowledge and skills on a wide range of activities so as to enable him to identify the various problems, before turning to the specialised personnel for assistance. It may also be mentioned that facilities in technical colleges are extremely inadequate, lacking most of the equipment.

4.9.10 Credit Policy

In the absence of a uniform and published policy for credit to SSIs from banks and other financial institutions, bank terms for lending and sources of assistance are unknown to most entrepreneurs. According to APT/USSIA survey of 1993, 0.7 per cent of SSIs around Kampala had received a loan with a hard currency component. According to the same survey, out of the total population contacted in their survey, only 24 per cent had actually taken the trouble to approach the recognised financial institutions for credit facilities. It was noted in the survey that of the 24 per cent, 61 per cent were successful. The survey further revealed that a majority of SSIs have a bankable collateral in the form of land. Basing on these findings, one may conclude that while much of the terms and conditions imposed by commercial banks may be considered unfavourable to SSIs, the latter also, out of ignorance and lack of information, have not taken the trouble to explore the opportunities available for them to secure financial assistance from the formal institutions.

4.9.11 Information

There is a total lack of information on opportunities, sources of technology and equipment, industrial costs, sources of raw materials, market, due to the absence of an information system regarding these issues in the country. In the absence of such a service, especially at district level, it has proved difficult for

the government to harness the opportunities presented by SSIs to channelise their potential energies and initiatives into productive use.

4.10 SUPPORTIVE SERVICES AND FACILITIES REQUIRED

In view of the numerous problems besetting SSIs in Uganda, a number of supportive facilities are required. These, include the following among others:

(Kizito 1981)

4.10.1 Advisory Service

Industrial advisory, extension and counselling services: In particular, SSIs need guidance on the promising lines of manufacture, expansion of existing firms or entry of new ones. They also need technical advice on matters relating to the selection of machinery, improved processes, better use of machines and materials choice of machinery, and plant layout.

4.10.2 Training Requirements

Training to entrepreneurs, managers and supervisory staff, appropriate enough to enable them identify and define problems of various kinds, and to seek information and advice on solutions from appropriate sources.

4.10.3 Industrial Research

SSIs cannot afford research on their own. There is therefore a need for the promoting agencies to establish industrial research institutes to assist in identifying technologies which may be adaptable to Uganda's environment, to put in place suitable laboratories and pilot plants for resource and process trials, to carry out research relating to substitution of imported materials with local materials, as well as conducting research relating to the use of by-products.

4.10.4 Development Finance

As already noted, commercial banks are unwilling to extend credit to SSIs. There is need for the government to introduce guarantee schemes on loans that may be given by commercial banks and other lending institutions, at the same time encourage banks to soften the terms and conditions of extending credit to SSIs, especially by taking into account additional factors like managerial skill of the individuals.

4.10.5 Industrial Estates

It was noted that most SSIs are housed in dilapidated accommodations. The promoting agencies should consider improving such conditions through construction of industrial estates. Industrial Estates have a number of advantages:

- a. They save the entrepreneurs from spending their meagre resources on issues like land, putting up of structures and arranging for the utilities, such as, water, power supply, etc.
- b. They provide improved conditions that can inspire the SSIs entrepreneurs to consider embarking on additional improvements of their own.
- c. Industrial estates can provide a focal point where other common services, such as, training services, counselling services, etc., may be established for the benefit of the SSIs in the estate.
- d. They encourage complementary transactions amongst the SSIs.

4.10.6 Common Facilities

Common services that need to be considered seriously in the promotion of SSIs in Uganda include:

- a. Bulk purchases and supply;
- b. Engineering services such as engraving, testing, electroplating, etc;
- c. Repair and maintenance of machinery;
- d. Intermediate production processes;
- e. Finishing production processes;
- f. Marketing of finished goods.
- g. Testing and quality control facilities;
- h. Waste disposal;
- i. Technical information service.

4.10.7 Marketing

These include:

- a. Assistance in product design, quality control and standardisation;
- b. Production of trade directories for SSIs products and services;
- c. Production of joint catalogues;
- d. Advertisement in technical journals
- e. Market research with regard to finding trends in consumer demands as well as testing the market for new products
- d. Assistance with regard to export markets.

4.10.8 Labour Relations

In addition to the usual labour issues, such as, working conditions, government regulations and labour management, effort should be made to advise SSIs about problems of personnel recruitment, employment terms, training on the job, handling of grievances, collective bargaining, incentives.

4.10.9 Inter-firm Contact and Assistance

This refers to strengthening the bond between SSIs and large firms by making the two aware of the mutual benefits that underlay from the contact between the two, be formal or informal. Needs of large enterprises that can be satisfied by SSIs through sub-contracting may be documented together with the specification and terms of delivery. Similarly, the capabilities of the small industries including

quality of the produce, volume and scheduling may also be documented. This information may then be exchanged between the two via "Tender Information Exchange Centres". Large firms may also be encouraged to provide technical assistance to existing and prospective sub-contractors as a means of strengthening sources of supply. Finally, those firms that are able to show a degree of competence but lacking in quality machinery may be assisted by the promoting agency through loans and grants to help them equip themselves so as to produce quality products and in the desired quantities.

4.10.10 Information

More information regarding this sector is needed. Hard data on which to base a comprehensive policy for SSIs development is required. Such information is useful to help in arriving at a suitable and practical definition of what is an SSI in Ugandas' context. Such information will help in determining:

1. The extent of development programme from which small firms will be entitled;
2. The necessary administrative machinery to spearhead the promotion and development of SSIs
3. Establish the necessary assistance programme in various areas.

4.11 SUPPORT INSTITUTIONS

There are a number of institutions in Uganda that have been involved in the promotion of SSIs. These include: Makerere University, Faculty of Technology; Uganda Polytechnic Kyambogo (UPK); a number of other technical colleges and institutions; Management Training and Advisory Centre (MTAC); local NGO, such a USSIA; international NGO like Appropriate Technology (APT) - UK; Fredrich Ebert Foundation - Germany; Commonwealth Secretariat; etc. The work of some of these organisations and institutions will be discussed in greater detail in the next chapter. Nevertheless, due to lack of coordination, the contribution of these agencies toward the development of SSIs has been far from satisfactory. There is presently no financial institution in Uganda specially designated to care for the needs of SSIs in the country. The work of some of the organisations and institutions named above will be discussed in greater detail in the next chapter.

4.12 UGANDA SMALL INDUSTRY DEVELOPMENT ORGANISATION (USIDO)

In view of the issues raised above, there is an urgent need for the government to provide an appropriate institutional arrangement to care for SSIs. A number of studies have been carried out concerning this issue over the years. One concensus view that has emerged from these studies was the creation of a parastatal organisation, preferably to be known as "Uganda Small Industry Development

Organisation, (USIDO)". It is proposed that USIDO should be charged with the responsibility of coordinating the activities of all institutions involved in the promotion of SSIs. This proposal was accepted by the government. However the body is yet to be given an appropriate structure and operational facilities. The suggested functions of USIDO are as follows:

1. Registration of SSIs and maintaining such a register up-to-date.
2. Coming up with a plan aimed at the promotion of SSI bearing in mind the economic, fiscal and monetary policies of the country
3. Undertake planning, construction and administration of industrial estates in the designated areas where SSIs are to be located.
4. Provision of advisory services and special assistance to those intending to invest in SSIs; such assistance should also give due attention to activities like writing up of feasibility studies, choice of technology.
5. Project appraisal especially with regard to assessing of markets, skills, raw materials, and the benefits of each project to the national economy especially in terms of employment, income generation potential, as well as environment effects.
6. Offering advisory service in management, including financial management, taxation, marketing, legal affairs, insurance, accounting and auditing.
7. Administration of incentive schemes extended to SSIs by Government and NGOS. Such incentives as already noted may include cash grants against fixed capital, workers training, research, rent subsidies, workshops, seminars, exhibitions, etc
8. Assist SSIs in the negotiation, acquisition and adaptation of foreign technologies. This could involve assisting SSIs in the procurement of machinery and equipment to set up factories and where necessary, their installation.

9. Undertake the collection, scrutiny and dissemination of information on various subjects of interest to the SSIs, eg. information on market and product development, new technologies, trade fairs, skills available and wanted elsewhere in the economy, investment opportunities.

4.13 INFORMATION SERVICE SYSTEM TO THE SSIs SECTOR

A critical analysis of the issues raised in the above discussion will reveal that majority of the problems associated with the SS sector in Uganda are, to a large extent influenced by the information problem. The success of any future policy, strategy or programme relating to industrial research, advisory services, marketing, linkage between big and small firms, training, etc, with regard to SSIs in Uganda, will greatly depend on the availability of a viable industrial and technological information system in the country. In chapter three, an attempt was made to identify the information needs of those involved in promoting industrialisation in the country. These may be summarised here as follows:

- a. State-of-the-art in the different sectors;
- b. The internal and external influencing factors;
- c. Availability of the required resources;
- c. Forecasts of economic, political, social, technological and cultural trends;
- d. Experiences in other countries with similar environmental conditions and utilising the same or similar technologies, etc.

4.13.1 Information Users

The main consumers of this information in the SSis context include the following groups:

- a. Entrepreneurs of various levels, ie. cottage, small, medium and large industries
- b. Policy makers and planners, both in government as well as private institutions;
- c. Researchers;
- d. Technologists;
- e. Consultants and industrial extension officers;
- f. Financing institutions, both government and private institutions;
- g. International and regional information networks and organisations.

CHAPTER 5

THE INDUSTRIAL INFORMATION SYSTEMS IN UGANDA: A CRITICAL ANALYSIS

5.0 SCOPE NOTE

The importance of information to industry has already been discussed. The role industrial information plays in planning, decision making and management have been spelt out. This chapter will discuss the nature, scope, strength and weaknesses of the present industrial information systems in Uganda.

There are presently a number of institutions dealing in business and industrial information service in the country. These include public institutions, private institutions, non-government and non-profit organisations, and foreign embassies in Uganda.

The public institutions include the Ministry of Commerce and Industry, and here I refer to the Ministry itself as well as its Information Centre; and information centres and libraries attached to academic and research institutes. In the private sector, there are associations of manufacturers as well as consultancy firms owned by individuals or groups of individuals. This discussion I will mainly dwell on information centres under public bodies and associations of manufacturers. Services rendered by individual Information Centres are given in Appendix 2

5.1 THE MINISTRY OF COMMERCE AND TECHNOLOGY

5.1.0 Background

The Ministry of Commerce and Technology is an information system in itself. It has four Functional Divisions in addition to the Administration and Finance Divisions, the main activities of which are listed below:

5.1.1 Planning Division

This is concerned with:

- Preparation of long term and short term industrial policies and programmes,
- Appraisal, monitoring and evaluation of industrial projects,
- Identification and analysis of industrial projects,
- Monitoring of external aid,
- Provision of industrial advisory services,
- Monitoring of Foreign Exchange (FOREX) allocations to industry, and
- Carrying out industrial surveys and organisation of industrial data.

5.1.2 Industrial Operations Division

This is concerned with:

- Control and supervision of industry,
- Licensing of industries under the Industrial Licensing Act,

- Promotion of incentive schemes for industry,
- Supervision and control of parastatals, and
- Promotion of regional cooperation.

5.1.3 Technology Division

This is concerned with:

- Acquisition of technology,
- Promotion of the transfer of technology,
- Up-grading of existing technologies,
- Promotion of research and development,
- Establishment of Technological Research Centres,
- Establishment of a Technological Data Bank, and
- Dissemination of information on appropriate technologies,

5.1.4 Small Industries Division

The Small-Scale Division is concerned with:

- Licensing of small and medium scale industries,
- Coordination of assistance schemes and financing of Small and Medium Industries' (SMIs),
- Appraisal and evaluation of projects in the

SMI sector, and

- Provision of advisory services

5.1.5 Remarks

As a result of fifteen years of economic and political mismanagement, Uganda became subjected to a severe economic squeeze. The government presently is unable to generate enough income, not even enough to meet the recurrent expenditure.

During the 1980s the Government adopted the Structural Adjustment Policy (SAP), by which the government was obliged to identify new priorities within its list of priorities. Accordingly, for the 1993/94 financial year, such priorities were: economic stability; justice, law and order; health and education. Sectors like industry, science and technology are presently on the shelf. Other than paying the wages and salaries of the workers, most services previously rendered by the Ministry are now on suspension, except those where it has been possible to secure foreign funding. The Division of Small Scale Industries, for example, has only two industrial extension officers for the whole country. These are stationed at the headquarters, but due to the lack of transport and other logistics, their work is limited to attending seminars where they may deliver lectures.

5.2 ACADEMIC INSTITUTIONS

5.2.0 Background

There are at present three universities in the country with an explicit interest in the development of science and technology. These are:

1. Makerere University.
2. Mbarara University of Science and Technology.
3. Uganda Polytechnic Kyambogo.

Libraries and information centres attached to these institutions make a distinctive contribution toward the development of science and technology in the country.

5.3 MAKERERE UNIVERSITY LIBRARY (MUL).

5.3.0 Background

Makerere University Library has two major functions:

1. It is the library of the leading academic institution in the country.
2. It serves as the National Library with the legal depository rights, and therefore, the National Reference Library.

In each of the two roles, the library plays a leading role in scientific and technological research in the country.

For both academic and reference purposes, MUL is endowed with a well stocked collection of reference materials - textbooks, journals, study reports, handbooks, manuals, yearbooks, almanacs, technical bulletins, statistical information, catalogues of different kinds and uses, etc.

5.3.1 Weaknesses

1. MUL being an academic library, its primary responsibility is to the staff and students of the university. Its document collection is, therefore, greatly influenced by the programmes and courses conducted at the University.
2. With over 8000 people as its immediate clientele, the library cannot afford to render the personalised services as those demanded in an information centre
3. MUL has provision for external users/borrowers but this is limited to select groups of people, mainly those with graduate qualifications. It also has no provision for industrial units to register as external users.

With these limitations, the services of Makerere University library as a viable reference library for industrial activities in the country are greatly curtailed. Presently, the only contribution being made by MUL towards the industrial sector is expressed only through the role it plays in the teaching and research at the University.

5.4 MBARARA UNIVERSITY OF SCIENCE AND TECHNOLOGY

Mbarara University of Science and Technology is a new university, inaugurated in 1989. At present it has one faculty, the Faculty of Medicine, and the library is still in its infancy.

5.5 UGANDA POLYTECHNIC KYAMBOGO (UPK)

5.5.0 Background

Uganda Polytechnic Kyambogo Library presents the first serious attempt by government to address the issue of industrial information in the country. However, because of the political and economic upheavals of the 1970 and 1980s, many changes have taken place in the working of this library. Nevertheless, It would be useful to examine the programmes and strategies that had been proposed for this library in its contribution toward the industrial sector.

UPK is situated in Kampala 3 kms on Jinja Rd. and 2 kms off the main road. The Institute came into being in 1954 under the name Kampala Technical Institute. This was a merger of the Kampala Technical School and Nakawa Engineering School. Since then, it has been changing names from time to time.

5.5.1 The Library

The Institute is endowed with a library accommodated in a modern and functional building that was constructed in 1963, with a total floor area of 9600 sq ft.

During its early life, the library benefitted much from international donor funding which came from agencies, such as UNESCO, The British Council, The British Information Service, The United States Information Service, etc. This enabled it build up an impressive book stock. By the end of the 1960s, the library had over 1200 books and subscribed to over 240 periodicals. Its scientific and technical reference sources included Engineering Index, British Technology Index, Building Science Index, British Standards, American Standards, the International Standards Organisation (ISO) Standards, technical bulletins, manufacturers catalogues, lists of representatives of overseas companies, etc. The plan at the material time was to make the library a viable reference library for technical information, through a service that was to be known as " Uganda Technical Information Service (UTIS)". (Thompson, 1967)

5.5.2 Uganda Technical Information Service

5.5.2.1 Objectives

The objectives of UTIS were:

1. To provide technical material and information to industry in Uganda;
2. To foster cooperation in information resources and technical libraries in Uganda;
3. To improve the resources of technical literature and information in Uganda by revealing resources previously concealed by general ignorance of their existence;
4. To stimulate the creation of technical libraries in firms in Uganda and to improve those already in existence through advising on the setting up and running of a firms own library.

5.5.2.2 Service

The UTIS service to the public, the industrial sector in particular, was meant to be a formal scheme. Unlike MUL where such a service to industries was informal, that is, given when requested, here, there was a deliberate and calculated commitment to reach out to industries. Outside users including industries were encouraged to become official members of the library service and arrangements were to be made to cater for their special needs. A public campaign also was to be launched to attract such users, especially from industry.

The choice to make the information service to public formal was based on a number of factors, such as,

1. It would fetch the library service greater status and prestige.
2. It would provide the library with a good weapon in the struggle for adequate financial support;
3. It could inspire donations from industries;
4. It could, in the long run, assist the library in its plans to be recognised as the national technical library, with legal deposit privileges.

5.5.2.3 Membership

The library was open to all firms and institutions associated with the promotion of industry, science and technology in the country, including industries, government departments, technical schools, individuals working in a technical field, etc.

5.5.2.4 Conditions of Use

A subscribing firm was entitled to nominate two of its staff as its representatives with access to the library and a service from it. Outside a radius of 30 miles from the college the limitation of membership did not apply and any member of a firms' employees could make use of the service. Inside the 30 mile radius, extra subscription at a slightly reduced cost could be taken for additional representation;

5.5.2.5 Subscription

In fixing the subscription fee, a number of factors were taken into account, some in support and others against the charging of fees.

5.5.2.5.1 Arguments against

These were as follows:

1. This was a service to the community, in a way, common to a service being given by other libraries where library service is catered for from public fund.
2. The industries pay their due share of taxes and are therefore entitled to a service without further charge;
3. Industries benefit the community through employment and production of goods and services;
4. Industries may make substantial voluntary contribution to social services;
5. A charge on information is morally wrong as it interferes with the dissemination of knowledge which is supposed to further progress;

5.5.2.5.2 Arguments for

These were as follows:

1. Services of a specialised nature as those of an information centre are expensive in material and trained manpower.
2. The service was to be given to profit-making firms;
3. There is a stiff competition for resources from the national treasury as such resources are always inadequate;
4. Respect of the library service will be enhanced if it can be seen that industries are prepared to pay for its services.

5.5.2.5.3 Subscription fee

Bearing in mind the arguments for and against the notion of user fee, it was generally felt that charging fee on a service which an industry is able and willing to pay for once it is convinced of its benefits would be justified. It was, however, also observed that at a time when the service is still new and untried, it would be unwise to sell the information at economic rate, especially in the absence of proof of the benefits to be obtained. Subscription fee was consequently fixed at what

promoters took to be a fairly low level so as not to deter any potential member, while giving some return against expenses incurred by the library.

5.5.2.7 Services

5.5.2.7.1 General services

The general services offered by UTIS to its registered members included the following:

- Free access to the library
- Unrestricted use of library materials;
- Enquiries by telephone, post and personal visit;
- Loan of materials, except reference books and current periodicals; and
- Photocopying service.

5.5.2.7.2 Specialised services

Among the specialised services were current awareness services (CAS), and indexing services. CAS included production of Current Monthly Accessions Lists and Subject Lists. Abstracting of articles was tried and found to be too costly in staff time and was put on indefinite suspension.

5.5.2.8 Publicity

Publicity was given to the service through brochures, letters to individual firms, newspapers, seminars and radio. Subject catalogues were sent to potential members at intervals, together with a personal letter in some cases. Mention was made in some of them of the fact that standards, periodicals, visual aids and trade catalogues were available in the library on the subject covered. Publicity was also made through part-time students, evening students and students on short courses at UPK, by giving them lectures about UTIS at the beginning and at the end of their courses.

5.5.2.9 Response to UTIS

The publicity exercise, despite all the effort that was expended, brought dismal results as there was no significant response in terms of new members from the industrial sector. It was noted that a majority of top management personnel upon receipt of publicity information about the service were simply passing it on or file it away and forget about it.

5.5.2.10 Lessons

Two lessons could be drawn from UTIS experience. These were:

1. Libraries and information centres were being seen by most people as useful for purposes of examinations only.
2. More research needed to be carried out about the popularisation of the information service to the industrial sector.

5.5.2.11 The Decline of UTIS

UTIS like her parent organisation, UPK, was not spared by the events of 1970 and 1980s. From 1970s it became increasingly difficult to replenish its book stock. Most donor agencies withdrew donations to the information centre, addition of new books ceased and so was subscription to journals.

Due to the dwindling library collection, access to the library by part-time students was suspended. The external borrowing facility was also abandoned. In the end, the UTIS service of reaching out to industries came to a halt. Instead, it remained an informal service, extended to only those who took the trouble to visit the library.

Presently, the library is in a very sorry state. The few reference sources on the shelf have been received through donation. The library is short of a photocopier, not to mention computer facilities. The staff on the ground were trained in conventional methods and have had no exposure in modern information techniques.

Staff morale is low due to poor remuneration. They lack the drive to succeed, let alone excel. They have made no effort to establish contact with the fairly progressive information centres around them, or take part in trade shows for promoting the information service.

5.6 MANAGEMENT TRAINING AND ADVISORY CENTRE (MTAC)

5.6.0 Background

MTAC is situated 3 kms on Jinja Road in Kampala. It was established in 1965 with a grant from UNIDO and ILO.

5.6.1 Objectives

MTAC's objectives are:

- To assist the industry and other economic sectors by introducing or improving management practices, techniques and methods with a view to raise productivity

- To prepare citizens for managerial functional and supervisory posts in the existing new industrial and business enterprises;

- To help citizens to become entrepreneurs by providing advisory services in management accounting, marketing and technical guidance.

5.6.2 Consultancy Service

Currently, MTAC offers consultancy in the following fields:

- Strategic planning,
- Operational feasibility.
- Organisation structuring and job description,
- Direct marketing,
- Production planning and control,
- Small business and industry development,

- Financial and management accounting,
- Feasibility study analysis,
- Staff appraisal systems, and
- Personnel selection.

5.6.3 Information Service

Attached to the institute is a library whose main responsibility is to satisfy the information needs of the staff and students at the Centre. The library offers a wide range of services which include abstracting, indexing, current awareness service, and Information Analysis and Consolidation. Information is disseminated mainly through document loan, brochures, handouts, and newsletter. This is not to mention the service rendered through the Industrial Extension Officers.

During 1970 and 1980s, funding to MTAC by donor agencies ceased, due to the unstable political and economic atmosphere in the country. This brought the activities of MTAC to a complete stop.

With the return of law and order in the country in the mid 1980s, there has been an effort to revive the consultancy service by the Uganda Government. With assistance from donor agencies, the buildings at MATC have now been refurbished and re-equipped.

5.6.4 The Documentation Centre

Among the new changes that are being contemplated at MATC is the creation of a Documentation Centre. Two personal computers have already been acquired for the purpose of creating a data base on management information. The staffing position at the library has also been strengthened and upgraded through creation of additional three posts of graduate librarians.

The proposed Documentation Centre is targeted for managers in industries, mainly to supply them with management information. The documentation Centre, therefore, is likely to put enough emphasis on technical and scientific information.

5.7 THE UGANDA NATIONAL CHAMBER OF COMMERCE (UNCC)

5.7.0 Background

UNCC came into being in 1988 when it was registered under the Companies Act. It is an association of businessmen throughout the country, mainly those who represent the field of commerce and industry. UNCC is a non-profit making body.

5.7.1 Membership

Membership is made up of individuals with a registered enterprise, who pay government tax or dues and have a business premises.

5.7.2. Objectives

The objectives of UNCC are to:

- Promote, coordinate and protect trade, commercial and industrial interests of Uganda and of the members;
- Establish, maintain, organise, manage and finance trade and industrial exhibitions and displays either on its own or in participation with other persons or organisations;
- Promote, support, or oppose legislative or other measures, which affect commercial and industrial interests;
- Secure uniformity in commercial usages and customs;
- Formulate, uphold and implement a code of business ethics;
- Collect and disseminate statistical and other information relating to trade, commerce, industry and shipping;
- Provide facilities for inquiry and research studies into commercial and industrial matters;
- Issue certificates of origins for exports and several other functions all relating to trade and industrial development.

5.7.3 The Trade Information Centre (TIC)

In 1989, Uganda secured a loan from the World Bank to enable her set up an information system for commerce and industry in Uganda under UNCC. The Trade Information Centre (TIC), became operational in 1991.

TIC services include handling queries on trade information from exporters and importers from within and outside the country. It also offers training on computer packages to UNCC members at subsidised rates

5.7.3.1. Library collection

The Centre has a small library with a collection of a few documents, mainly composed of periodical titles, directories, inventories and information on trade associations.

5.7.3.2. Users

These include entrepreneurs, exporters, importers, researchers, planners, technicians, etc. both large and small. Total membership presently stand around one hundred.

5.7.3.3 Collaboration

TIC collaborates with the following centres:

- Uganda Manufactures Association Information Centre
- Export Promotion Council Documentation Centre,
- Ministry of Trade and Industry Information Centre
- Ministry Finance and Economic Planning Library
- UNIDO

5.7.3.4 Information Technology

The Centre is in possession of two computers and these are used for, word processing, database management, desktop publishing and computer training services. Computer training covers a number of business packages.

5.7.3.5 Databases

The databases maintained by TIC include:

- TINET Database
- Export Database
- Import Database

- Membership database
- Certificate of Origin Database

In addition to the above databases, TIC has plans to link with Exponet - Geneva.

5.7.3.6 Problems

The Centre presently is being manned by an expatriate from Korea. The effort to train local staff has proved a problem due to the inability to retain skilled personnel because of the low remunerations paid by UNCC to its employees, as compared to what is being paid by other institutions around it. One individual recruited to understudy the expatriate left immediately after taking a course in information science in Vienna.

5.7.4.7 Remarks

At the time I visited the Centre, the expatriate engaged to set up the information centre seemed to be occupied more by the work of giving instruction courses on computer packages. The relevancy of the computer lessons, however, remained questionable to me for a number of reasons:

1. It is a known fact that the majority of the indigenous businessmen are the small-scale type, who are unlikely to be in possession of a computer in the short run.

2. The big entrepreneurs who own computers can afford to take these courses from the numerous private computer schools around Kampala, without having to wait to be subsidised by NUCC.
3. It was difficult to establish whether the money collected from the computer lessons was being put to any good use.

The expatriate when queried about these three issues remained incommunicado and unwilling to discuss the issue on the ground that for him, his work was to follow instructions from his superiors. Nevertheless I remained convinced that it would be hard put to expect UNCC to have have anything to show in the form of an information centre at the end of the project.

5.8 THE UGANDA EXPORT PROMOTION COUNCIL (UEPC)

5.8.0 Background

UEPC was set up by an Act of Parliament in 1983 to carry out a wide range of macro-economic functions geared towards export promotion and development.

5.8.1 Objectives

Objectives of UEPC are:

- To understand national export needs and institutionalise practical trade mechanisms;
- To document, store and disseminate trade information, especially that pertaining to exports;
- To inspire government and exporters by offering technical advice on export trends, incentives as well as tendering advice for export policy formulation;
- To act as a national export sales promotion and public relations officer.

5.8.2 The Trade Information Service (TIS)

With a loan from the World Bank to the Government of Uganda, UEPC established a documentation centre in 1986 at its headquarters in Kampala that came to be called, "The Trade Information Service (TIS)". The role of TIS is the dissemination of business information to its users. Its routine activities include helping exporters and overseas buyers of Uganda's export products by providing advisory, inquiry-reply services, documentation and library services, regarding export information.

TIS collection of information sources is wide in scope. It includes publications, such as, bank reports, publications from industries, company catalogues, economic and trade reviews, financial and trade newspapers, etc.

5.8.2.1 Staffing

Staffing at TIS includes, one librarian and one documentalist.

5.8.2.2 Users

Users include exporters, importers, managers, reseachers, businessmen, students planners and decision makers.

5.8.2.3 Fees

TIS charges no fee for her services. However, there is a plan to introduce user fees in the near future so as to enable the Centre cover the operational costs.

5.8.2.4 Collaboration

TIS collaborates with the following information centres and organisations:

<u>Organisation</u>	<u>Nature of collaboration</u>
UMACIS/UMAIC	- Exchange of publications - Database networking - Information exchange
UNCC	- Exchange of publications - Database networking - Information exchange
UBS	- Information exchange
Bank of Uganda	- Information exchange
Investment Authority	- Information exchange

5.8.2.5 Information Technology

TIS has three personal computers. These are, however, reserved for networking purposes as the library is not yet computerised. However, plans are underway to computerise it.

TIS is presently the country node for the TINET service in Uganda which is mainly concerned with PTA network services. Other international/regional databases to which TIS is linked include ITC Market Intelligence Network, Geneva. The Centre uses the Foxbase data management software for storage, retrieval and management of TINET data files.

5.8.2.6 Remarks

TIS is a well organised information centre with a potential to grow into a viable information centre on trade matters.

5.9 UGANDA MANUFACTURERS ASSOCIATION (UMA)

5.9.0 Background

UMA is an association of Ugandan manufacturers, founded in 1960s when the country was having a young but robust industrial sector. The economic and political instabilities that befell the country in 1970 and 1980s, caused a temporary demise of UMA, and it did not revive until 1988.

5.9.1 Objectives

The objectives of UMA are:

- To promote, protect and coordinate the interests of industrialists in Uganda.
- To act as a watch dog and effective mouth piece for its members;
- To initiate and facilitate discussion and exchange of information amongst members on issues of industrial concerned;
- To advise government on key policies affecting industry

5.9.2 Membership

UMA presently has a membership of over 350 firms, mainly large and medium scale firms, covering a wide range of the production systems in the country. These include manufacturing, processing, banking, insurance, transport and clearing, tourism, and other industries related to manufacturing. Membership fee varies according to the size of a firm, minimum fee being Ush 30,000 per annum. UMA is unwilling to admit SSIs to its membership for fear of overstretching the managerial capability of the association. Besides, UMA considers the needs of SSIs too small for the kind of prestige the association would like to maintain.

5.9.3 Information Service

With assistance from UNIDO, UNDP, CMA and the World Bank, UMA set up two information centres in Kampala; the Uganda Manufacturers Association Consultancy and Information Service(UMACIS), and the Uganda Manufacturers Information Centre (UMAIC).

5.10 THE UGANDA MANUFACTURERS ASSOCIATION CONSULTANCY AND INFORMATION SERVICES (UMACIS)

5.10.0 Background

UMACIS was established in 1990 as a private and profit-oriented institution. It was mainly formed to provide business and technical consultancy services and information to investors, manufacturers and financial organisations.

5.10.1 Consultancy service

Consultancy service offered by UMACIS include:

- Technical advice aimed at improving efficiency, capacity utilisation and profitability of existing manufacturing operations;

- Assistance in upgrading the existing manufacturing base, transfer of technology through purchases, licensing and training;

- Market research, surveys, industrial sector studies and other statistical information;

- Feasibility studies of potential manufacturing operations;

- Information and advice concerning joint venture investment with both local and foreign firms;
- Management consulting and business analysis;
- Policy development, research and analysis.

5.10.2 Users

The main users of UMACIS include the Government of Uganda, manufactures, businessmen, investors, both local and foreign, planners, decision makers, etc.

5.10.3 Consultancy Fee

Consultancy fee is 1 per cent of the project cost. However, UMA members are favoured with a 10 per cent discount. In 1993, the consultancy unit received a grant from the United States Government to subsidise its consultancy activities. Since then, UMA members are required to pay only 20 per cent of the normal consultancy fee.

5.10.4 Library Collection

The library collection includes reports, trade catalogues, survey reports, training manuals, information on trade associations, encyclopedias, feasibility studies, newspapers, both local and foreign. The library, however, is for use only by the technical staff of UMACIS and not by the public, including UMA members.

5.10.5 Information Technology

UMACIS presently has three personal computers. These are used for word processing, database management and desktop publishing.

5.10.6 Staffing

UMACIS has two Systems Analysts. Besides, the Centre has a core of professional staff in diverse fields of engineering, law, economics, industrial chemistry, statistics, etc. These are limited in number. Their effort is supplemented with external support from UMA Associates and UMA Fellows who can be called upon from time to time when need arises to handle projects.

5.10.7 Collaboration

UMA collaborates with a number of international consultancy firms from countries like Kenya, Britain, USA, etc. It has access to their data and expertise which it uses for big projects, either as the main contractor or as a sub-contractor. These external links have greatly enhanced UMAs in-house capability to take on highly complex and delicate jobs.

5.10.8 Remarks

UMACIS is presently one of the best local consultancy firm in the country providing the best information service to the manufacturing sector.

5.11 THE UGANDA MANUFACTURERS ASSOCIATION INFORMATION CENTRE (UMAIC)

5.11.0 Background

Uganda Manufacturers' Association Information Centre (UMAIC) is a sister company to Uganda Manufacturers' Association Consultancy and Information Service (UMACIS) in that they both belong to the same parent body UMA. UMAIC, however, specialises in reference service only. It is located at the headquarters of UMA, about four kilometers from UMACIS.

5.11.1 Service

UMAIC service is open to the entire general public at no cost. Queries received cover a wide range of topics including investment opportunities, export markets, trade rules and regulations, joint venture, technology transfer, new and improved technologies, technology know-how, etc. More than thirty queries are received and responded to each month.

5.11.3 Dissemination of information

Contact with the public is by telephone, mail service as well as personal visits. The Centre conducts visits to UMA member firms to acquaint itself with the problems of the individual members. It also organises seminars for information officers from UMA firms, to introduce them to modern information handling techniques.

5.11.4 Databases

The Information Centre maintains the following databases:

- TINET for PTA trade information;
- PCGLOBE for basic economic data on all countries;
- WORLD TABLES for World Bank statistics;

- LIBRARY RECORD for book catalogues;
- CUSTOMS RECORDS for import/export statistics from the Customs Department.

5.12 MINISTRY OF TRADE AND INDUSTRY INFORMATION CENTRE

5.12.0 Background

There has always been a library at the Ministry of Industry. This, for a long time, was a modest library in no way a service which accessed, organised and disseminated technological information. It was a collection of a few books, mainly UNIDO publications, plus some directories of machinery manufacturers, and the whole collection was very much outdated. They were utilised neither by internal nor external users. Neither existing nor prospective entrepreneurs visited the Ministry in search of technical information. The idea to strengthen, expand and modernise the library was mooted in 1984. This materialised into a project, Project No. DP/UGA/84/003/A.

5.12.1 The Structural Adjustment Programme (SAP)

During the mid 1980s, Uganda Government adopted the Structural Adjustment Policy (SAP). Among the key issues in SAP were:

1. Reduction of the size of the civil service and selling off of a number of state corporations.
2. Shift by the Ministry from the role of managing enterprises to that of a facilitator, that is, limiting its work to creation of the enabling environment.

5.12.2 Unemployment

The ministry identified promotion of medium, small and micro enterprises as one way of solving the problem of unemployment that was to result from implementation of SAP. The retrenched workers were to receive a package in cash form. It was needful to assist the retrenched by providing them with information about investment opportunities. The Ministry acknowledged the role industrial and technological information could play in this endeavour and thus took steps to create an information centre at its headquarter. This came to be known as the "Industrial and Technological Information Unit (ITIU)" .

5.12.3 The Industrial and Technological Information Unit (ITIU)

5.12.3.1 Objectives of ITIU

The objectives of ITIU are to:

- Generate and organise a databank of information related to SSI
- Devise a system through which information can be disseminated;
- Devise a system for identifying information needs;
- Establish an information advisory and investment counselling service;
- Create awareness of the importance of information in industries; and
- Take part in information networking system in the country.

5.12.3.2 Target Groups

ITIU target groups include:

- Small and micro enterprises of 5 to 10 workers
- Non-government organisations and other organisations providing venture capital and support to SSI
- The unemployed.

5.12.3.3 Methodology

ITIU was expected to execute its functions through a number of methods. These included:

1. Identification of user needs through field visits, surveys, personal contact, discussions, communication through letters, telephone, analysis of past surveys and available literature.
2. Information organisation and retrieval through scanning of information materials, classification, abstracting, database creation.
3. Dissemination of information through personal contact, question/answer service, counselling, audio-visual, radio and television programmes, and also through library materials.

5.12.3.4 Project Input

US\$ 692,000 was obtained as a loan by the Government from the World Bank for the purpose of setting up the information centre. This was to meet costs, such as, the services of the expatriate staff; training of local staff both at home and abroad; purchase of a vehicle, personal computers and the accessories, a photocopier, plus other needs to make the proposed centre a modern information centre.

5.12.3.5. Status, June - March 1991

According to the Status Report June - March 1991, by 1991 the Centre had received a total of 802 textbooks, 135 reprints, 82 Ugandan reports, and a collection of directories. Most of these materials, however, had been received through the Heads of Departments who got them mainly as donations during their visits abroad. It is reported that up to this time, there had been no direct purchase of books by Government for the Information Unit. The Centre subscribed to 18 journals during its first year of existence; subscriptions, however, were discontinued thereafter due to lack of funds. All the journals the information unit continued to receive subsequently came free of charge from international agencies like World Bank, UNIDO, ECA, etc. who were supplying them free of charge. A majority of these documents, however, related to global policy issues rather than industrial information.

5.12.3.6 Users

ITIU regular users include:

- Planners and decision/policy makers in industry,
- Prospective entrepreneurs and investors,
- Funding organisations/institutions,
- Consultants and engineers,
- Research workers,

- Students, mainly from Makerere University,
- Quality testing officers,
- Exporters,
- Managers,
- Bankers.

5.12.3.7 Enquiries As Per 1990/1991 Report

	<u>July/Dec</u>	<u>Jan/June</u>
Foods & Beverages and Tobacco	86	76
Paper & Paper products and printing	12	15
Non-metallic products	15	16
Testing & Weaving apparels	9	16
Wood & Wood products	17	8
Leather & Leather Products	9	3
Chemical/Chemical Products & Rubber	25	30
Planning, Policy and Research	86	63
Energy	5	15
Others	<u>68</u>	<u>49</u>
Total	<u>332</u>	<u>291</u>

Table 5.1

5.12.4.6 Publicity

Up to 1991, the Information Centre was still in its formative stage and it had very limited materials. It was therefore felt unwise to carry out a publicity of the service. So the information being reported above concerned a service that had not been made public.

5.12.5 The Decline of ITIU

From the middle of 1991 the Information Centre encountered a series of problems:

5.12.5.1 End of the Project

In the middle of 1991, the project was terminated prematurely! I must report here that I was never able to establish clearly the factors that led to this as most people interviewed regarded the matter sensitive, and thus, were unwilling to discuss it. I however, got the impression that it had something to do with the launching of a new project in the same Ministry, "The Indicative Plan".

The officers in charge of the new project, who included top officials in the Ministry longed to have some computers for the project but which the Government was unable to provide due to the problem of scarce resources. At this time, the computers at the information center, which had been acquired for the purpose of developing databases and also for networking purpose, had not been put to much use mainly because of the acute irregularity in power supply. Consequently, it was decided by the ministry to transfer these computers to the Planning Department, which took over the photocopier as well.

5.12.5.2 After Project Period

After the premature termination of the project, the Government, through the Ministry of Industry assumed responsibility of the Information Centre. Due to budget constraints, however, funding to the information centre remained extremely inadequate. The Centre never featured in the Ministry' budget except once when Ugsh 200,000/- was budgeted for books. Unfortunately, even this money was not realised because of a budget cut initiated by the Ministry of Finance, mid way of the financial year, and which affected almost all public institutions.

5.12.5.3 Staffing

The Public Service Commission declined to sanction the post of Information Officer with graduate qualifications to run the Information Centre. One individual had been recruited for this purpose and was in the process of understudying the expatriate. She had also attended a number of short courses in information science both at home and abroad. She eventually returned to her former profession which was teaching.

Another officer from within the Ministry of Industry was asked assist in the technical work at the Information Centre on a part-time basis. She was expected to combine her normal duties with the Ministry with library work. In 1993, this officer left to pursue further studies abroad, and no replacement has been made at the Information Centre.

5.12.5.4 Premises

The Ministry of Trade and Industry is presently housed in a four storey block belonging to a returnee Asian. The Asian has been allowed to repossess his property. He has offered the Ministry to retain two of the four floors, provided the government would be willing to pay him rent. This change is likely to affect the Information Centre greatly as it may have to surrender part of the room it occupies; that is, if they do not close it completely.

5.12.5.5 Present State

The Information Centre is currently in a very sorry state and poorly managed. The Unit is under the Department of Technology, but, while the officer in charge of the Department recognises the essence of information in the growth of the industrial sector, he is yet to make the effort to reverse the trend.

During my last visits to the Centre, I noted that the key to the library had been surrendered to high school students who were using the library for reading purpose. In the absence of the librarian, these students could open the library and lock the place with themselves inside. They could do this at a time when the genuine users are hanging outside waiting for the librarian to turn up. Top officials in the Ministry have not paid any serious attention to this situation.

Therefore, it can be said that the US\$ 692,000 loan to the country by the World Bank was never put to proper use of building up an Information Centre.

The rationale to dwell on these issues is to take note of the apathy of top officials toward information systems, inspite of the rhetoric fed to donor agencies especially when soliciting aid.

5.13 UGANDA SMALL-SCALE MANUFACTURERS ASSOCIATION (USSIA)

5.13.0 Background

USSIA was formed in June 1979 to act as a mouth-piece for Small Scale Industries in Uganda, in their attempts to obtain assistance from the government and donor agencies

5.13.2 Objectives

The objectives of USSIA are to:

- Mobilise of all SSIs in the country.
- Influence Government Policy on the development of SSI.
- Bridge the gap between government and SSI.
- Lobby for training opportunities relevant to the SSI.
- Provide business and technological information services.
- Negotiate for financial and technical aid for SSI.
- Promote marketing of SSI products.
- To assist in the procurement of inputs and raw materials for members.

5.13.3 Membership

USSIA has over one thousand members. These are categorised as follows:

<u>Size</u>	<u>Asset Value</u>
Very Small Scale Industries	less than \$5,000
Medium Small Scale Industries	\$5,001 to \$10,000
Large Small Scale Industries	\$10,001 to \$30,000

Subscription by individual firms vary according to the size of the firm.

5.13.4 Contribution

By late 1980s, USSIA had become a very powerful association recognised by all government institutions and donor agencies. It became the chief adviser to the government on matters concerning SSI. It should be recalled that during the 1980s, the manufacturing industry was at its lowest in its history, and SSIs had assumed full dominance of the industry, producing over 80 per cent of the locally manufactured products.

5.13.5 Services

USSIA acted as a consultancy firm to SSIs providing services like reference service, technical inquiry service, project appraisal and feasibility studies.

5.13.6 Decline of USSIA

Since 1992, USSIA has been on the decline. This is partially due to the formation of UMA, who replaced USSIA as a voice of the manufacturers in the country. Many large small scale manufacturers, once the back-borne of USSIA, joined UMA because of the greater prospects they anticipated in UMA. Many manufacturers contacted during the course of this research indicated that they had not renewed their membership with USSIA since 1992, though their names

continue to appear on USSIA membership list. It should be acknowledged that the list is a vital asset to USSIA management, especially as a tool when shopping for donor funds.

The future of USSIA will depend on its ability to attract donor funds in future. Otherwise, USSIA has lost the clout it once had in directing the affairs of SSI in the country.

5.14 OTHER INFORMATION CENTRES

There are many other information centres in the country that can be of a great service to the industrial sector. Many of these are affiliated to government ministries and departments, embassies, state corporations as well as private institutions.

5.14.1 High Commissions and Embassies

Among those affiliated to embassies, the two most notable ones are The British Council Library and The United States Information Service. The two provide reference service with up-to-date data and information pertaining their respective countries. They are open to the general public free of cost. They have a very rich stock of reference information in the form of indexes, catalogues, directories,

handbooks, almanacs, etc. These are available on diskettes, CD ROM, as well as hard copies. They are also capable of providing on-line access to a number of international databases.

5.14.2 Government Institutions

Among the information centres affiliated to government departments and corporations, the most notable ones include:

- The Ministry of Finance and Economic Planning Library
- Bank of Uganda Library
- Uganda Commercial Bank Library
- Uganda Development Bank Library
- Institute of Bankers' Library, etc.
- Attorney General Office Library
- The High Court Library

These are well organised libraries and information centres. They are rich in information concerning the economy, government regulations and policies, etc. Service in most of these centres is, however, of the conventional type.

5.14.3 International Organisations

Another category of information centres that is worth mentioning here are those serving the international agencies, such as, UNDP and UNESCO. These are modern libraries but closed to the public, except under very special considerations.

Besides the information centres mentioned above, there is a long list of private consultancy bureaux.

In most of the institutional libraries the scope, policy, rules, regulations and conditions of service are dictated by the parent body. In many cases, the scope of their collection is limited to the interest of the parent organisation. Access is also restricted to members of the parent body.

5.15 THE INFORMATION PROBLEM

Bearing in mind the information service system in the country as described above, the manufacturing industry can be categorised into four units. In the first category, we have the multinational companies, such as Coca Cola, Pepsi Cola, Mitchell Cotts, etc. These are subsidiaries of larger companies based abroad. The local subsidiaries enjoy almost unrestricted access to the extensive research undertaken by the parent organisation at their headquarters or at their regional

centres. In Uganda's case, for example, most multinational companies operating in the country have regional offices in Nairobi, Kenya. Coupled with this, many of such companies are endowed with adequate resources and are capable of setting up well equipped and stocked information systems. It can, therefore, be said that multinational companies experience no major information problem.

In the second category are the seasoned local manufacturers, such as the Methas, the Madhavanis, and the Mukwano. These, like the multinationals, have the wherewithal to set up modern information systems to support their industrial activities.

In the third category are the middle level indigenous manufacturers, such as, Sembule, Mulwana, etc. These have been able to organise themselves under the umbrella "Uganda Manufacturers Association". Under this umbrella, they have been able to attract donor assistance with which they have been able to set up a modern information system as described above.

Left out in the cold are the SSIs. These have insurmountable problems which inhibit them from organising themselves into a viable association. They are characterised with extreme scatteredness, high level illiteracy of the employees, lack of proper premises, limited or total lack of technological skills, etc.

Today, many small and medium scale enterprises in Uganda spend considerable sums of money on feasibility studies, project appraisals, and other issues related to information. Much of this money is earned by a few private consultancy bureaux around Kampala. Many would be investors have been discouraged by the cost of information gathering exercise. Others embarked on projects they were unable to complete due to inadequate research carried out at the beginning. There are many who, after losing the whole of their lifetime saving to the consultancy bureaux are unable to start, or if they do start, are unable to complete.

It should be noted that a majority of the consultancy bureaux around Kampala are owned or co-owned by the public officers in charge of approving projects. After using the government machinery and resources to collect this data, they transfer it to the private bureaux. Through their surrogates, they conduct studies for prospective investors, charging exorbitant fees. These studies are in the end submitted to themselves at their offices for official approval.

CHAPTER 6

TECHNOLOGY ACQUISITION AND TECHNOLOGY TRANSFER: THE ROLE OF UNIVERSITIES AND RESEARCH CENTRES

6.0 SCOPE

This chapter discusses the nature and structure of industrial training in Uganda. It examines the issue of linkage between research/training institutes on one hand and industries on the other.

6.1 TECHNOLOGY

In a broad sense, technology encompasses scientific, technical, engineering and managerial knowledge necessary for the production of goods and services needed by society.

6.2 IMPORT OF TECHNOLOGY

A majority of the technologies found in developing countries, Africa in particular, are foreign in origin. This is because the indigenous research facilities are not yet developed enough to meet the challenges in most of the technological areas.

Effective utilisation of technological advances for development requires effective communication between research and development centres on one hand and potential users of the technical knowledge and know-how, such as, enterprises, on the other. In this context, information support systems become a vital component in the implementation of development programmes.

It is important that imported technology is adopted and adapted with discretion and care so that it is beneficial to society rather than creating new problems.

Problems, such as, technological dependence or environmental pollution are a common phenomenon in a number of countries that are trying to industrialise.

It is therefore important that in the formulation of national policies regarding technology, its acquisition for development purposes and implementation are based on a sound knowledge of the needs of society and of the technology options available.

According to Kuznets, economic growth depends largely on the increase in the available stock of useful knowledge, and the ability to put such knowledge to effective use in development activities. Timbergen, on the other hand, identified that information and information exchange are key elements in international cooperation. However, cooperation in information can be hampered by the cost of information transfer. The communication cost tend to vary from 2 to 50 per

cent with the area of application, averaging around 19 per cent of the project cost.

6.1.1 Modes of Technology Transfer

Technology transfer can take a wide range of forms:

- Direct importation of machinery and goods embodying the desired technology;
- Hiring of foreign experts and consultants;
- Direct investments by multinational corporations to provide technology along with other industrial inputs, such as, capital and management skills;
- Licensing and other contractual arrangements with foreign governments and enterprises; and
- Obtaining formulae, generalised concepts and data for product design and development.

6.1.2 Technology Transfer Mechanisms

There are a wide range of mechanisms through which technology transfer can be effected:

- Movement of people between scientific, technological and industrial centres/enterprises;
- Spin-off from new missions and projects;

- Scientific and technical publications, i.e. books, serials, reports, directories, patents, standards and specifications, engineering drawings, trade literature, etc.
- Mass media, exhibitions, trade fairs, demonstrations, get-togethers;
- Interaction of suppliers and consumers;
- Science and technology meetings, training courses, on-the-job training, workshops, extension services; and
- Technology banks, technology development centres, etc.

6.1.3 Direction of Flow

For a long time, information flow in Africa has been one directional, that is, from the developed to the developing countries. This has much to do with the historical ties between the two hemispheres which manifested itself in colonialism. Reciprocating this flow, is the flow of monetary resources from the South to the North. It is estimated that in 1965, developing countries spent about US\$400 million in purchasing technology from developed countries, the expenditure amounted to about US\$ 1.2 billion in 1975, and US\$ 6 billion in 1985. (Neelameghan 1992).

6.1.4 The Need for Information Systems

Technology imported from the developed world usually suffers from a number of limitations in the developing country environment. It is usually designed for an environment different from that found in the developing countries. The technology, manufacturing methods, production lines and distribution systems

used by the importing country may not have been designed in social and economic settings comparable to those in which the technologies were originally developed and applied. In many cases, imported technology is quite removed from local practices; it may make new demands in terms of know-how, and sometimes may call for profound change in the attitudes of the various people, such as, planners, decision makers, investors, managers and the workers. Sometimes, it may call for new equipment, and thus additional financial resources, etc. Imported technology, therefore, can have considerable social as well as economic implications in its application; and for effective implementation, need to be examined critically.

Sometimes, imported technology may be found to be well suited to the production objectives, including compatibility with physical environment, investment profitability, labour employment conditions, etc. However, decision on the choice of the technology needs to take into account a wide range of socio-economic data. Decision makers need to have information on experiences with and impact of the technology in similar social and human environment. Asia-Pacific Centre for Technology Transfer (APCTT), for example, emphasises the need to formulate a systematic framework that would help in the:

1. Assessment of national technological status, needs, capabilities and potentials;
2. Integration of technological considerations in the socio-economic development planning process;

3. Strengthening of national capacity for effective development, transfer and utilisation of technologies.

These issues raised by APCTT, require an appropriate information and data system and service for technology management, (Neelameghan 1992).

6.1.5 Assessment of Technology Needs

The assessment of technological needs and capabilities of a nation need to be carried out in several stages in a systematic way. For example: (Neelameghan 1992)

Stage One:

Evaluation of national technological capabilities including the determination of:

- a. Status and potentials of national resources.
- b. Status and technology content of commodities produced.
- c. Status and skill structure of human resources.
- d. Status and maturity of institutional infrastructure.

Stage Two:

Derivation of technological areas of relevance from an analysis of national socio-economic and production sector objectives.

Stage Three:

Classification of technological areas of relevance, grading them into areas of strategic importance, high priority, and others.

Stage Four:

Determine the specific, generic and clusters of technologies needed based on technological transformation process analysis.

Stage Five:

Classification and time-phasing of national technological needs by technology domain:

- a. Import technology domain;
- b. Traditional technology domain;
- c. Exporting technology domain.

6.1.6 Selection Process

Usually, choice of product and production system in a manufacturing process is based on two factors, namely, production factors and social factors.

6.1.6.1 Production Factors

Among the issues most weighted here are, labour intensiveness, capital intensiveness, simplicity in operation, maintenance, repair and organisation; whether the production system is inward oriented, that is, it can be sustained by locally available skills and entrepreneurs, raw materials, market, energy resources, etc.

6.1.6.2 Social Factors

This concerns issues, such as, effect of production on balanced development in the country, especially rural development; whether it is ecologically sound, that is, it does not add to the pollution, or lead to deforestation, etc; whether it is commercially viable, either in the short run or in the long run; whether it will lead to increase in the supply of goods or service to the vulnerable groups, such as, low income groups; etc.

Both the social and production factors call for extensive and intensive surveys, whose results will be valuable to the decision makers, and this in turn call for an effective information system.

6.1.7 Technology Acquisition

Technology transfer/acquisition includes not only technology but also methodologies, systems related to production, consultant services, specialists, patents, specification and drawings, etc. According to Al Thiga, technology acquisition regarding industrial products involves:

- a. Feasibility studies;
- b. Selection of fields;
- c. Survey of natural resources;
- d. Logistics and infrastructure;
- e. Design;
- f. Technical drawings;
- g. Manufacturing;
- h. Production technology and management;
- i. Management expertise; and
- j. Research and development.

6.1.8 Information Needs

The main requirement, with regard to information is, therefore, to have access to the whole range of data needed for decision making. This should cover scientific and technological information originating abroad as well as from home,

national statistical, demographic, administrative and legal data from existing data banks and, where appropriate, fresh or additional information from surveys and environmental scanning.

Access to relevant information will enable the consideration of several factors, including the three mentioned below in the pre-decision studies:

1. The profitability of imported technology, on the basis of financial costs of the transaction (charges, purchase of know-how) and of the real cost arising from the transfer (eg. technical assistance).
2. The soundness and usability of the imported technology in the actual situation where it has been used. This information may lead to the some technical modification in order to achieve improved adaptation.
3. Assimilation of the technology, based on a forecast of the practical conditions in which it will be used.

6.1.9 Sensitisation

It is important to stimulate the interest of all those working to bring about industrial development and those responsible for it in using information effectively and efficiently, in particular, information to assist in pre-decision studies relating to the development of SSIs. This should be done in view of a wide range of

6.2.2 Technology Centre Linkages

A TC may be linked to institutions, systems, and information sources relating to industries and industrialisation both within the country as well as outside the country. In the context of networking, it is necessary to establish links with appropriate government agencies and authorities, industries, systems, sources and services at the local and national levels and with technological cooperation partners in other countries and with appropriate organisations at the international level.

6.3 INSTITUTION-INDUSTRY LINKAGES

Almost every country invests in research and development, in institutions of higher education, in research centres, and in similar programmes. The long range objectives include the development of research manpower, capabilities and facilities in the country, to provide support to development programmes, so as to make their own contribution to the fund of knowledge in various field. However, in many countries facilities to provide a frequently updated inventory of ongoing research and dissemination of research results to potential users are weak. The capacity and facilities needed to convert ideas generated by research into innovations and their practical applications in development are again deficient.

The transfer of an idea from the laboratory to the field, for instance, the small industries as an appropriate technology is a long process and involves several stages. Appropriate information supports services, however, can help to shorten the time lapse between the stages. (see fig. 6.1)

6.4.2 Function

The Functions of the Council are:

1. to advise on and coordinate the formulation of an explicit national policy on all fields of science and technology;
2. to assist in the promotion and development of indigenous science and technology through:
 - preparation of science and technology plans;
 - the organisation of training of science and technological (S&T) manpower;
 - the carrying out of scientific and technological research and development (R&D);
 - technology transfer and adaptation;
 - the establishment of research and experimental development institutions, science and technological documentation and information services, pilot plants and other testing grounds and standardisation and quality control centres.
 - encouragement of local innovations by providing more rapid and less costly incentives and programming integrated and coordinated science and technology activities.
3. To assist in the rationalisation of the use of foreign science and technology.
4. To act as a clearing house for information on research and experimental development taking place in scientific institutions, centres and other enterprises and on the potential application of their results.

5. To protect intellectual property through appropriate patent laws and to operate a national patent office.
6. To disseminate research and development findings through seminars, workshops, publications, etc.
7. To work in close cooperation with and coordinate all scientific and technological activities of persons, institutions, sectors and organisation.
8. To draw up estimates for the implementation of the national science and technology
9. To review and advise on programmes and budgets for the promotion of science and technology.

6.4.3 Special Committees

The Council has six special committees, these are:

1. Physical Science Committee;
2. Industrial Science Committee (for Engineering and Technology);
3. Medical Sciences Committee (for Human and Veterinary Medicines);
4. Agriculture and Allied Science Committee;
5. Natural Sciences Committee (for bio- and geo- Sciences); and
6. Social Sciences and Humanities.

6.4.4 Functions of the Specialised Committees

The functions of the Specialised Committees are to recommend to, report and advise the Council on all policy matters within its sector of scientific and technological activities in the country and in particular:

- the financing of scientific and technological activities;
- the training programmes for personnel involved in scientific and technological activities;
- projects to be carried out by researchers;
- monitoring and reporting the progress of scientific and technological activities from time to time, as need arises and to require scientific and technological activities;
- the documentation of information on results of Scientific and Technological activities;
- the application of results of scientific and technological activities;
- the assignment of scientific and technological responsibilities to different institutions or persons;
- to effect measures leading to cooperation between persons engaged on related scientific and technological projects.

6.4.5 Procedure To Conduct Research.

Research can only be carried out in Uganda after the project has been approved by the Uganda National Council of Science and Technology, and the Office of the

President. A researcher is required to submit six monthly progressive reports on his/her research project, and submit final results on completion of the same project. Researchers from abroad are required to submit the final results of their results prior to their leaving Uganda. In the cases of projects undertaken for the awards of higher degrees, researchers are required to deposit two copies of their theses with the Council.

6.5 RESEARCH INSTITUTES

Uganda's investment in scientific and technological research is still very marginal. Most of the research centres existing in the country were a creation of the colonial period, and majority are agro-based. These include:

- Kawanda Agricultural Research Institute, Kampala;
- Namulonge Agricultural and Animal Production Research Institute, Kampala;
- Forest Research Institute
- Fisheries Research Institute, Jinja;
- Livestock Health Research Institute, Tororo;
- Serere Agricultural and Animal Production Research Institute, Serere.

The two leading institutes of higher learning in the country, Makerere University and Uganda Polytechnic Kyambogo are basically teaching institutions, with research being undertaken on a limited scale. A number of faculties at Makerere University run post graduate courses up to the Ph.D. level. The Faculty of Technology, however, has no post graduate programmes at the moment, although effort is being made to launch such programmes in the near future.

6.6 UGANDA POLYTECHNIC, KYAMBOGO

6.6.1 Training

UPK offers training in the following fields:

- Building and Civil Engineering;
- Water Engineering;
- Architectural Drafting and Design;
- Mechanical and Production Engineering;
- Motor Vehicle Engineering;
- Refrigeration and Air Conditioning;
- Electrical and Electronics Engineering; and
- Radio and Television Technicians Courses.

UPK courses lead to awarding an Ordinary Diploma and a Higher Diploma. The collage also conducts evening classes in craft courses and these lead to ordinary certificate awards.

6.6.1.1 Certificate Courses

These are meant for low and intermediate skilled workers. Intake is between 200 to 300 students per annum, and demand has been increasing every year. It is possible to advance gradually up to a diploma.

6.6.2 Staff Strength

The college has a total staff strength of 120 teaching staff, both full time and part time, with qualifications ranging from Higher Diploma through to PhD.

6.6.3 Research Accomplishments

The college carries out limited research in the following fields: Biogas, design in mechanical fields, solar energy, factory materials. It also renders testing services.

6.6.4 Consultancy service

There is no formal arrangement to render consultancy service to industries by UPK. However, service is being offered privately by members of staff through individual contacts. Attempts to form an institutionalised consultancy bureau failed as members preferred to work individually, mainly for fear of having to share the proceeds with the association.

6.6.5 Uganda Technical Information Service

It may also be recalled that the UTIS service discussed in chapter three is stationed at UPK.

6.6.6 Future Plans

UPK plans to introduce a degree course "Bachelor of Technology" in the near future. Unlike the Bachelor of Engineering degree, it is intended to make the Bachelor of Technology degree more practice oriented.

UPK is now under a rehabilitation process under a World Bank Project EDB II. with new constructions being put up and re-equipping of the laboratories and workshops. These changes will enable the college to embark on additional programmes in its curriculum as well as increasing the intake.

6.6.7 Remarks

Technical Education is under the Ministry of Education. The officer in charge of this department is an educationist. Attempts to have a technologist as head failed due to poor remuneration in the civil service.

UPK mainly caters to the needs of Kampala in industrial training while upcountry regions are catered for by the local technical institutes. UPK is supposed to set the pace for all technical colleges in the country. Unfortunately, the college is not represented in the Department of Technical Education at the Ministry of Education. This, to some extent, has undermined the efforts that could lead to curriculum development concerning Industrial training in the country. Presently, colleges still follow the syllabi adopted from British Technical Colleges during the colonial days.

6.7 MAKERERE UNIVERSITY

6.7.1 Background

Makerere University has several faculties, but for this exercise, I will limit my discussion to the activities of the Faculty of Technology.

The total research grant of the whole university presently stands at Ushs 100 million (approx. US\$ 100,000/-), which is being shared out by over seventy departments. Since 1991/92, however, the University has not released any funds for research activities. Consequently, there is almost no ongoing research in most departments, except where it is externally funded.

6.8 THE FACULTY OF TECHNOLOGY

6.8.1 Training

The Faculty of Technology is has several departments including Mechanical Engineering, Civil Engineering, Electrical Engineering, Survey, Architecture,

6.8.2 Research Activities

6.8.2.1 Mechanical Engineering Department

The Department of Mechanical Engineering is engaged in the following research activities:

- Solar Dryers
- Charcoal Fridges
- Raw material improving techniques

6.8.2.2 Electrical Engineering Department

The following topics are being researched:

- Energy: Alternative sources of energy
- Standardisation in locally fabricated electrical appliances, eg. Stabilisers.
- Telecommunication: Propagation of radio signals.

6.8.2.3 Civil Engineering

The following topics are researched:

- Low cost building materials,
- Low cost energy systems,
- Low cost construction materials,

- Management of hazard wastes,
- Traffic problems in urban areas - packing
- Rural water supply systems,
- Waste products treatment systems,
- Designing of high rise structures in both steel and concrete,
- Engineering content of vernacular (indigenous) building materials.

Contact with the public is mainly through informal interactions, professional seminars, questionnaires and student industrial training.

6.8.3 Technology Consult

Technology Consult is an arm of the Faculty of Technology, a voluntary association formed by the staff members of the Faculty. Consultancy services are organised into six divisions, namely, Architecture, Computer Engineering, Civil Engineering, Mechanical Engineering, and Survey. Contact with the public is informal, mainly through its members. The proceeds are shared between the researcher and the Bureau.

6.8.3.1 Problems

Very little is known about Technology Consult even at the University campus as almost no publicity has been carried out about its existence. It was explained that this was a problem arising from the norms of "professional ethics" which do not encourage professional organisations taking recourse to public media. On the

other hand, the Bureau has no funds to produce brochures, let alone going on air via radio or television hour.

The biggest problem facing Technology Consult, however, arises from the members themselves who own or are attached to numerous consultancy organisations in town. This has exposed Technology Consult to a divided loyalty from her would be promoters.

6.8.4 Technical Staff

The Faculty of Technology has a teaching/research staff of more than eighty people. Unlike UPK or the Faculty of Medicine at Makerere University, technicians at the Faculty of Engineering are not recognised as professionals. They are instead treated as supporting staff with no access to research benefits. It should be noted that technicians and craftsmen do many things engineers are unable to do, and in the developed world, a successful technician can earn as much as a senior professor at the University. Due to lack of recognition, poor remuneration and lack of opportunities to advance, majority of the technicians from Technology, and other departments, resign to join other sectors in town.

6.9 INDUSTRIAL TRAINING

The most visible and formal link between industry and institutions of higher learning in Uganda today is through attachment of students during industrial training. For many years, there has been this kind of cooperation between

industry and institutions of higher learning, especially Makerere University, Uganda Polytechnic Kyambogo and National College of Business Studies, Nakawa.

Institutional/industrial links are important because most technical innovations enter developing countries through technological changes in enterprises. In Uganda to-date, with the numerous ongoing rehabilitation projects, a number of new technologies are being introduced in the country.

In the past, industries in Uganda used to sponsor their personnel to educational institutions on a block lease system and also accept students for industrial training much more readily. Industrial training continues to this day but with many constraints.

A UPK survey of 57 major enterprises in Kampala and Jinja (Uganda's main towns) in March/April 1993 by Hartmann and Manyindo showed that there are only 244 Industrial Training places available. These have to be competed for by all training institutes in the country with a total capacity of over 5000 students of whom 500 students are from UPK. It should be noted that while the industrial sector has been shrinking over the years, enrolment in technical institutes has been on the increase.

Industrial training in Uganda is organised in each of the technical institutions and universities through the department of Industrial Training. The main duties being

placement and supervision of students during the training. The exercise usually is carried out at the end of each academic year for a duration of about 3 months. Students are trained through the various sections or departments of a firm within the duration of their industrial attachment. During the course of the training, lecturers from colleges visit the students to assess and discuss the training programmes with the supervisors and the students.

6.9.1 Finance

Industrial training in Uganda is solely financed by government. Technical Institutes get the equivalent of their capitation grants for the training. At present colleges, such as, the University receive Ushs. 370 per student per day (approx. US\$ 0.35). Similarly, lecturers also get a marginal amount. Worse still, these allowances often take a long time to be released by government, thus, many times disrupting the programming exercise. Although many of the firms visited expressed willingness to take on students, a majority were ready to do so only if there were no financial obligation on their part.

6.9.2 Assessment

While Industrial Training is considered as an integral and important part of the students training, it does not form part of the overall assessment. This has often led to lack of seriousness by students during training, giving rise to absenteeism and irregular attendance.

6.10 TECHNICAL INSTITUTES

Generally, cooperation between training institutions and employers has been difficult to establish with regard to public training systems.

Technical institutions are accountable to their respective ministries for routine administration, where, as already noted, a majority belong to the Ministry of Education. Consequently, effectiveness in job placements has not been a criterion in the budget assessment of the individual institutes.

There is a rigid control on curricula by the ministry, making it difficult for systems and institutions to respond to information from employers. It should be appreciated that the quality of education and training depend a great deal on the ability of institutions to adjust the content of training to meet changing demand for skills. This is especially true in training for strategic occupations that are rapidly changing under the impact of new technology. Sustainance capacity for curriculum development and revision is a characteristic of flexible and high quality training. The rigidities of central curriculum coupled with lack of adequate resources restrict institutions from attempting more innovative and flexible approaches to vocational instruction. (Lugujjo and Manyindo, 1993).

6.10.1 Finance

Cash-stripped as Uganda is today, the government is unable to mobilise the necessary resources to build efficient and sustainable training systems. Aside from paying for the teachers, very little is being done to improve the environment under which training institutions operate. Weak recurrent cost financing has led to significant deterioration in the base materials, equipment and facilities needed for practical training. Budget cuts usually fall most heavily on non-salary operating costs, such as, maintenance, spare parts and consumable materials. At the extreme, this leads to workshops functioning without equipment and supplies. Training is, thus, reduced to lectures with the practical skills component of the curriculum almost disappearing. This has led to frequent complaints by industries about the over-specialised and over-theoretical character of their recruits.

6.11 INSTITUTION-INDUSTRY LINKS

There are quite a number of benefits that can result from institution - Industry linkage:

6.11.1 Industries

Industries gain access to knowledge, research and facilities in higher education.

6.11.2 Universities and Research Centres

- It offers them a chance to learn about the latest developments;
- It offers practical opportunities to students to study new production processes and techniques in the work place;
- For teachers, it offers them an opportunity to develop and diversify their essential vocation and to work with equipment which often not available in Universities;
- It provides an opportunity to execute joint projects at a minimal cost.

6.11.3 Proposals By Manufacturers

A number of proposals have been made by a cross-section of manufacturers regarding strengthening of institute/industrial links in the country. Such proposals include the following:

1. The rehabilitation of various infrastructural facilities taking place in the country, such as road construction, should involve as much as possible local young technicians and expertise instead of foreigners like Italians and Philipinos who can be seen in many places.
2. Training institutions should take an initiative to identify talent that exist in industry and involve them in teaching and research activities.

3. In 1993 USAID gave assistance to Uganda Manufacturers Association (UMA) and one component of the assistance was to take on MBA graduates from USA universities to carry out research under the auspices of UMA. This could be emulated by government and local institutions.
4. New technologies are being acquired/imported into the country and applied in industry locally. Training institutions could try to develop a technology acquisition culture by taking it upon themselves as an obligation to assess such technologies and ensure that maximum exploitation is got from these inflows for the benefit of the country.
5. There is a considerable amount of information that could make industry more efficient but is not being accessed by local industry for various reasons. Training institutions, with the help of the new information technologies, should could assume the responsibility to tap, process, manage and disseminate this information.
6. Industries have been contributing a great deal to fund raising activities in the country. These contributions could make a great impact if they were concentrated and focused on matters of direct benefit to them, such as funding chairs, equipment or promoting research activities in training institutions.

6.12 MAKERERE CONSULTANCY BUREAU (MUCOBU)

This is the name that is being proposed for a University based Consultancy and Information Centre. The idea for the University to organise itself into an institutionalised consultancy service was first floated by the highest office on the land during the late 1980s. This came as a rejoinder to the demand for a living wage by the University tutors, which the government was unable to pay due to limited resources. The dons were advised to find ways of selling their expertise to the public to supplement the meagre salaries by organising themselves into a private consultancy bureau. Although the idea has received a wide welcome from most of the corners, nobody has so far taken the trouble to explore its feasibility. Those one would consider to be in the best position to be knowledgeable like the Faculty of Technology, are contented with individual consultancies they provide privately.

Technology Consult was in a way initiated to serve as a pilot study of the feasibility of the idea and was eventually to become one of the constituents of MUCOBU. Unfortunately, Technology Consult, as already noted, became a victim of disloyalty and mismanagement by its would be promoters.

Generally, the Makerere University community have a very narrow and misconceived idea of the possible scope of MUCOBU. Uganda, as already noted, is dominated by small industry and business enterprises. This is presently misconceived to be the only hinterland available for an organisation like MUCOBU. This shortsightedness is due to the fact that nobody has taken the

trouble to investigate the issue seriously. The working of UMACIS which would serve as a good guide has not been considered by anybody at Makerere University. As already mentioned, in addition to handling consultancies from medium-sized enterprises, UMACIS has now matured to handle gigantic tasks, some of which are international in character, all its limitations, notwithstanding.

Makarere University is greatly advantaged in any consultancy service of a sizeable nature. Being the highest institution of learning in the country and one of the oldest in Africa, its influence goes beyond the frontiers of Uganda, and thus, any consultancy service associated with it would override any other service of the kind provided in the country. Coupled with this, is the concentration of technocrats and specialists, laboratories and libraries which other centres lack.

Makerere University has been criticised by many for failing to create an impact in the technological advancement of the country. The irony here is that, on the one hand, you have the SSEs producing 80 per cent of the manufactured products in the country, and their main problem being lack of skills and technological know-how. On the other hand, you have a reservoir of engineers and technicians, majority underemployed in the non-functioning industries, while others are completely idle as they are unable to find jobs.

Many academicians interviewed at Makerere University and UPK during my research complained of being sidelined by Government in a number of projects, and instead, choose to deal with foreign firms.

Both manufacturers and Government officers respond to this as being due to failure on the part of the experts in the two institutions to organise themselves. Presently, due to the limited capabilities of UMACIS, which is today the only viable information centre in the country, the Government has been turning to foreign firms for a number of its projects, even in areas where Makerere could claim excellence.

An institution like Makerere University or UPK or any other research centre in the country can collaborate with the industrial sector in information and information transfer in a wide range of forms. Below, are examples of the such areas. However, this could only be possible if the two institutions make use of the enormous resources at their disposal to organise themselves into an institution like a Technology Research and Development Centre. With this in place, such centres would be able to provide the following services to the industrial sector:

1. Establish and maintain liaison with industrial units and enterprise agencies, offices and organisations in the public and private sector concerned with development and management of industries.

2. Provide advisory and consultancy services to industries and agencies concerned with industrial development.
3. Provide research and development support to industry.
4. Assist in technology assessment, evaluation and selection.
5. Establish applied research or technology development centres/projects within the university or research centres with industry support and using the human resources and facilities of the centre.
- 6 Offer training to industry personnel
7. Assist in identifying and selecting appropriate training programmes.
8. Organise and conduct courses and workshops.
9. Organise or participate in field activities and extension services or give support to such services
10. Provide testing, research and pilot plant facilities for use by industries
11. Undertake industry diagnostic studies.

12. Assist in the demonstration of know-how.
13. Assist in organising exhibits of innovations, new products, processing techniques, equipment, etc, and participate in such events organised by other agencies.
14. Organise seminars and similar meetings on topics of interest to small industries and to organisations concerned with industrial development.
15. Organise open houses, industry-research meets and similar get togethers.
16. Provide for attachment arrangement to industrial staff who want to engage in research
17. Assist enterprises in establishing information service units, system, databases, etc.
18. Provide information services to SSEs, such as, the following:
 - feasibility studies;
 - forecast and trend reports;
 - composite documents;
 - technical inquiry service;
 - referral service;
 - information analysis and consolidation;

- statistical reports;
- notification of contracts and tenders;
- patents information services, etc.

19. Supporting the above types of services by preparing directories and inventories, and databases of profiles of institutions, agencies, information sources, etc., such as the following:

- centres of excellence;
- technology centres;
- industrial development banks and financing organisations;
- technology information centres;
- technology data and information bases and sources;
- chambers of commerce;
- small enterprises (sector-wise);
- industry associations;
- management and labour associations;
- small industries advisory and assistance agencies;
- documentation and information systems and services;
- training centres and training programmes in fields of interest to small enterprises
- government agencies/departments of development planning, R and D support, industry, trade and commerce, industrial licensing, regulatory measures, quality control, standardisation, environment, etc;
- regional trade, economic, and other groupings;

- International assistance agencies and programmes;
- technology transfer, collaboration, and other cooperation agreements and arrangements;
- skills and expertise

CHAPTER 7

DESIGNING AN INFORMATION SUPPORT SYSTEM FOR INDUSTRIAL DEVELOPMENT

7.0 SCOPE

This chapter explains the genesis of information centres, and discusses some of the outstanding features characterising a technical information centre.

7.1 NEED FOR AN INFORMATION SERVICE

Although the substantive service of the Industrial and Technological Information Unit at the Ministry of Trade and Industry was very short lived, the response of the public towards this service was very encouraging. Even now, a number of manufacturers and prospecting investors continue to visit this centre, despite lack of any meaningful service being rendered at the moment. Many industrial promoters in the country including non-government organisations have been vocal in advocating for a viable information system to cater for the needs of the small industries. In all studies and seminars taking place in the country concerning SSIs, the issue of information has been at the top on the agenda.

Thus, despite the negative attitude that was demonstrated by some individuals in the Ministry of Trade and Industry toward ITIU, the need for an information service is a genuine expressed need. What is most urgent now is a campaign to sensitise those it concerns most in government, to give this service a priority status in the national plans. It has already been demonstrated that of the various industrial resource inputs, information is the most important resource as it controls and guides the use of all the other resources.

In this chapter, an attempt is made to point out some the key elements that should characterise an information system for the manufacturing industry. This is necessary because many people in Uganda, especially those in authority, sometimes fail to make a distinction between a conventional library and an information centre.

Information, as a resource in industrial development provides the following services. It helps to:

- generate new information;
- understand and evaluate the existing information;
- make gainful decisions;
- enhance productivity
- produce new commodities; and
- provide education and training.

7.2 INFORMATION AND RESEARCH

An information system is characterised by three sub-system, namely, Primary Generation of Information (PGIS), Primary Communication of Information (PCIS) and Secondary Information Work, Services and Systems (SIWSS).

7.2.1 Primary Generation of Information (PGIS)

New or primary information is largely generated through research. Mankind is faced with many problems and the only way to find solution to these problems is through research. In the course of doing research, new information is generated. In other words, research generates new information and knowledge.

7.2.2 Primary Communication of Information (PCIS)

PCIS refers to communication of new information or knowledge to potential users. A research exercise cannot be considered complete unless and until the new knowledge generated is brought to the attention of the potential users. This may be done through reports, publishing in a journal, disseminating through mass media, etc.

7.2.3 Information Barriers

The working of PGIS and PCIS is greatly influenced by the existence of a number of barriers between the information source and the potential users. Such barriers include the following: vast quantities of information, inadequate resources, language multiplicity, space, time, administrative and legal restrictions, and physical access problems.

Barrier	Users' Problems
Accelerated growth on infor. Increasing rate of obsolescence	Inadequate time for reading and assimilating information
Wide variations in quality and reliability of data and infor.	Difficulties and inadequacy of time for evaluation and selection
Inter-disiplinary nature and scatter and seepage of infor.	Can specialise only in a narrow range of subject areas
Different modes and styles of presentation of ideas	Different users need specific patterns of presentation
Restriction of users' access to certain information sources	Inaccessibility to documents needed
Multiplicity of languages of communication	Familiarity with one or a few languages only

Table 7.1
Information Barriers

7.2.4 The Five Fundamental Laws

The barriers enumerated above should be seen in the context of the Five Postulates regarding information propounded by Ranganathan. These were:

- Information is for use;
- Every reader his/her information;
- Every information its user;
- Save the time of the user/ save the time of the staff;
- Information system is a growing organism.

7.2.5 Secondary Information Work, Service and System (SIWSS)

In order to overcome the barriers mentioned above, and to achieve efficient and effective information service and management which is in conformity with Ranganathan's postulates, SIWSS came to be established. The work of SIWSS can be seen in the working of different types of information centres, namely, Libraries, Documentation Centres, Museums, Archives, Information Analysis

Centres and Technical Information Centres. The activities of these centres taken together can be summarised as follows:

- Dissemination of information about research in progress;
- Preparation of indexes, abstracts, and other aids to primary information sources;
- Preparation of factual reviews;
- Library services, such as, procurement, organising, cataloguing and circulation;
- Reprographic services;
- Translation services;
- Information Analysis and Consolidation; and

7.2.5.1 Scatter and Seepage

This refers to identifying the scatter and seepage of information in different information sources. It includes selection, processing and indexing so as to put together all the information relevant to a query/subject in a form convenient to the user.

7.3 INDUSTRIAL INFORMATION SYSTEMS

There are various kinds of information centres, namely, library, documentation centre, archives, museums, information analysis centres, and technical centres.

When I talk of an information support system to the industrial sector in Uganda, I mainly refer to an institutional arrangement or system that can bring together the activities of a number of these centres, especially the libraries, documentation centres, Information Analysis Centres and Technical Centres in system or network.

It was reported in the previous chapter that the first attempt to create an industrial information service in Uganda was in early 1960s. Since then many changes have taken place, both in information needs and information handling. (Sundaram, 1991) In this context, it is not sufficient, in Ugandas' context, to propose here just a revival of the defunct Uganda Technical Information Service.

7.3.1 Information Needs

The most conspicuous change in Uganda relating to information needs concerns the change in the formulation of the national economic plans. This has undergone change in a number of ways including shift of emphasis from:

1. Economic growth to growth with social welfare and well-being of the people;
2. Centralised planning approach to decentralised planning approach;

3. Demand for aggregate data and information to disaggregate data and information for planning purpose at the different levels.

7.3.1.1 Centralised Planning

Centralised planning is a system where the power to allocate the national resources is vested into the hands of a few people. This approach is occasionally referred to as "top-down planning process" as the exercise is made a preserve of a committee of a few people in the government. The planners are supplied with the relevant information concerning the economy. Such information may touch such issues as, national income, national expenditure, total exports, total imports, total output, etc. On the basis of this information, the national resources are allocated. The work of the information support system here is to provide the necessary statistical information, of mostly aggregated data to the planners.

7.3.1.2 Decentralised Planning

Decentralised planning, on the other hand, is a system where the planning process is transferred to the districts, and within districts, to the local authorities, such as, Resistance Councils in the case of Uganda. It aims at involving the people right from the grass root in local development planning. The process is code named "bottom up approach" or "multi-level approach" because it is the people, or through their representatives, who identify the projects in their localities. Such projects, as identified by all local authorities in a District are brought together to make a District Plan. At the District Level, the plans are again put together to make a National Plan; (see fig. 7.1).

In multilevel planning, planning systems are more attuned to the structural, demographic, economic and social characteristics peculiar to each region or locality in the country. With such a system, it becomes necessary to devise mechanisms and procedures that will ensure effective capture, processing and flow of data and information so as to permit interface and interaction between and among people at different area levels. This is necessary in order to make the planning process harmonious, interdependent, and participatory.

**SCIENTIFIC, TECHNICAL SOCIO-ECONOMIC INFORMATION
VERTICAL AND HORIZONTAL FLOWS**

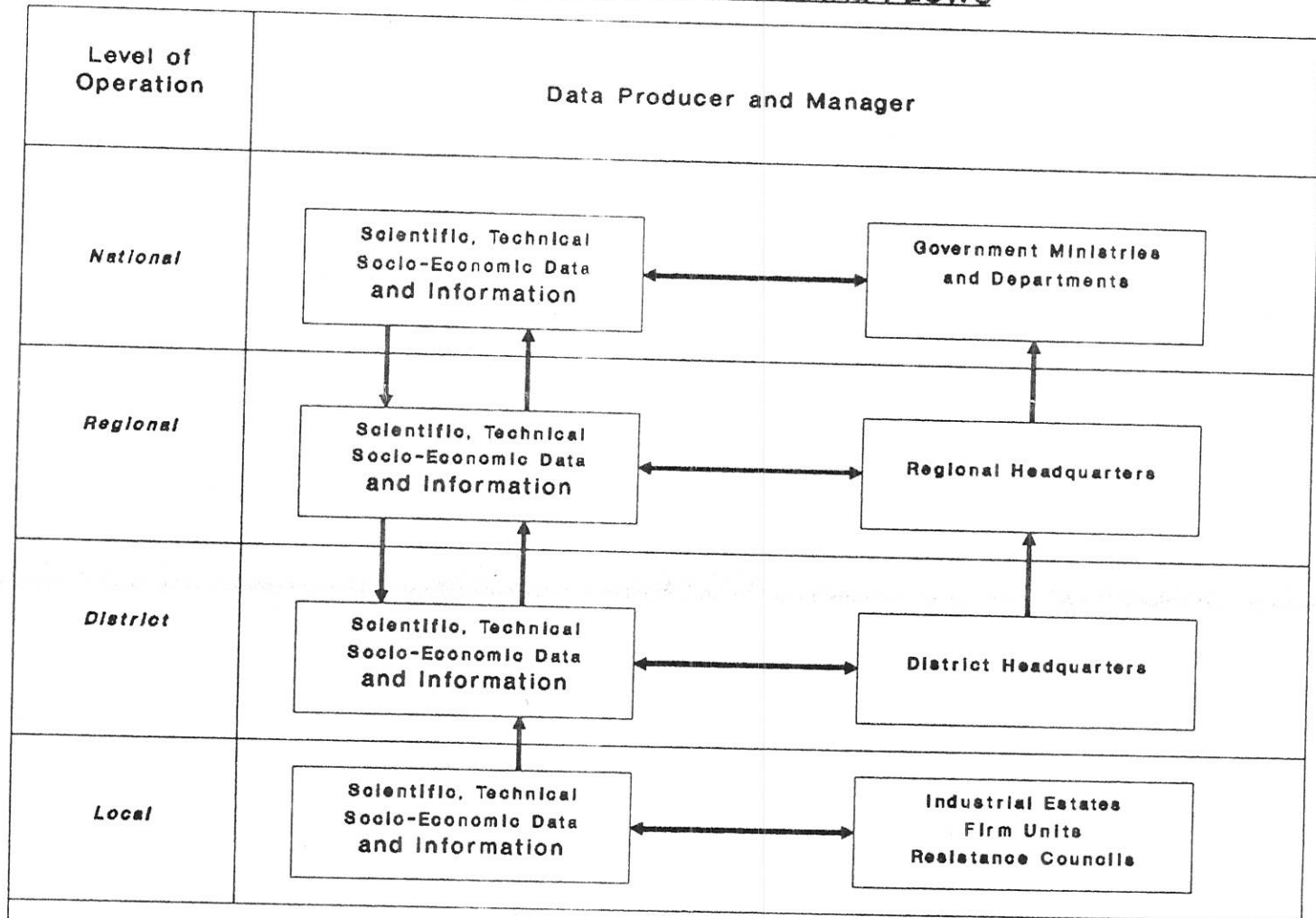


Fig 7.1

Adapted From Neelamegan 1991

Multi-level planning is both a technical, and a management and negotiation process. Decision making is based on a participatory and negotiated planning approach, which means that decisions are not made on a unilateral or bilateral basis but is a result of negotiations among a number of parties concerned. In the information context, this means that there are several information users, and possibly with distinct needs. With such varied requirements, data and information demanded by the different levels would be needed at different levels of aggradation and disaggradation.

In decentralised planning, data and information are normally required on a large number of micro-variables, touching on a wide range of issues, such as, income, poverty, employment, standard of living, basic services, quality of life, sustainable development, etc. Decentralised planning is also area and people specific, taking into account information about the cultural and behavioral patterns of the people, their asset ownership systems, the way they handle or practice their economy, their institutional and organisational capacities, etc.

Multilevel planning can therefore be said to demand more information, more of micro-level information, which the traditional systems, in their traditional statistical machinery were not able to capture. The new planning system cuts across a number of hierarchical levels, with the planning process becoming increasingly information-intensive and information selective. Thus, with multi-

level planning, the need for data and information at disaggregated levels grows, just as the need for more specialised and specific information.

7.3.2 Information Technology

The need to collect an increasing volume of information required for performing a wide range of analyses for planning has brought about new problems, especially concerning information handling and processing. It has introduced the element of time and speed in information processing.

Decentralised planning is a time bound activity calling for speed and timeliness in accomplishing tasks. Usually, plans have to be prepared according to a time calender. The process to have them approved by the final authority and have them considered for funding in the budget allocation is long and must follow a rigid time frame. This implies that the process of data collection, updating, transformation, processing and analysis must be responsive in terms of speed and commitment. This time squeeze in a way sets a limit to the nature and volume of data and information to be collected, the ways in which these may be collected, the kind of processing and analyses for planning that may be performed, and the kind of compromises that may sometimes be necessary.

These three developments, time, speed and accuracy can only be met through

application of information technology based on computers and telecommunications advances. Information technology provides tools that can quickly capture, store, process and transfer data and information of all kinds.

7.3.4 New Information Structures

The new information challenges arising from new information needs coupled with application of information technology call for some degree of administrative and organisational changes, i.e., orgaware. It is becoming increasingly necessary to incorporate information as a support to decision making in order to make maximum benefits from technology . However, for such changes to succeed in multilevel planning, they need to be preceded by the establishment of multi-level information structures. In a multilevel planning system, the planning authorities at different levels have to continuously act and interact with each other before taking decisions on programmes and projects. If this is to be done efficiently, data and information for planning must flow up and down and horizontally. These flows cannot happen automatically. Specific institutional structures need to be created for that purpose and procedures established for the directing the flows.

(see fig. 7.1)

Thus we need information systems which can link information users with information providers and information sources. Without such linkages, the planning system in decentralised planning can be greatly hampered as available data for planning may not relate itself to the planners/users needs.

There is, therefore a need today to restructure information systems to make them more attuned to these new developments. This is not possible by simply remodelling the existing systems, as most countries have been doing. What is needed is a complete overhauling of the earlier systems, putting in its place a new system that is suited to multi-level planning.

7.4 INSTITUTIONAL SOURCES AND INTER-INSTITUTIONAL LINKAGES

There is a wide range of institutions that are involved in one way or the other in the promotion of the industrial sector. These may be public or private bodies, they may be regional, national or international. Services provided by such institutions range from credit, technical know-how, information, advice, equipment, etc. Among such agencies and institutions, we have the following examples: research centres, financial institutions, state corporations as well as government departments. These bodies need information from various sources for them to be able to carry out their activities successfully. At the same time,

they also produce information useful to the manufacturers as well as those involved in promoting industries.

A viable industrial information system aimed at promoting industrialisation in a country should establish links with all institutions and agencies that have a role to play in promoting industry in the country. One way of achieving this is through preparation of profiles of all such agencies, detailing the kind of service and assistance they render to the industrial sector, and the information needed as well as produced by them. Such analytical profiles may include information on elements as those mentioned below:

1. Kind of information being generated by which unit, by whom and for what purpose in the organisation;
2. What information is transmitted to which other agency, in what form and at what frequency;
3. What information is received or demanded by an agency from a small enterprise;
4. How is the information received by an agency from another agency or SSI handled, processed and used;

5. What data and information would be most useful to each agency in order for it to be able to provide optimum service to the SSEs;
6. What documentation is available about the structure, programmes, services and activities of each of these agencies;
7. What are the contact points, information flows or channels, etc. to each of these agencies.

This information, once compiled, can be very useful in establishing networks and resource sharing arrangements among the agencies and between them and the SSE.

Below, are some of the important institutions and agencies that contribute to growth of industrialisation in Uganda:

- Bank of Uganda
- Uganda Commercial Bank
- Ministry of Planning and Economic Development
- Makerere University
- Agricultural Secretariat, Bank of Uganda
- Department of Census and Statistics, Ministry of Planning and Economic Development

- Department of Manpower Planning, Ministry of Planning and Economic Development
- Management Training and Advisory Centre
- East African Development Bank
- Ministry of Agriculture
- Uganda National Chamber of Commerce
- Uganda Manufacturers Association
- Documentation Centre, Ministry of Public Administration
- United States Aid for International Development (USAID)
- Fredrich Ebert Foundation
- Uganda Small Scale Industries Association

7.4.1 Uganda Commercial Bank

Uganda Commercial Bank provide the following types of services to the industrial sector:

1. Financial assistance;
2. Economic and technical advice and information;
3. Advice and information on the small industries, eg. scope and prospects for SSEs, technical know-how, market, etc.
4. Research and development facility liaison with related organisations.

In executing these functions, the bank collects data and information from different sources, such as, Uganda Development Corporation, the Central Bank, Ministry of Planning and Economic Development, Research Centres, other banks, etc. This information is used by the bank to monitor the progress of the industries it finances.

On the other hand, the bank also generates promotional literature in form of pre-sanction reports, inspection reports, monthly and quarterly reports, etc. These are useful sources of information to entrepreneurs and other agencies involved in the promotion of industrialisation in the country. UCB interlinks are exemplified in fig 7.2.

UCB INSTITUTIONAL INTERLINKS

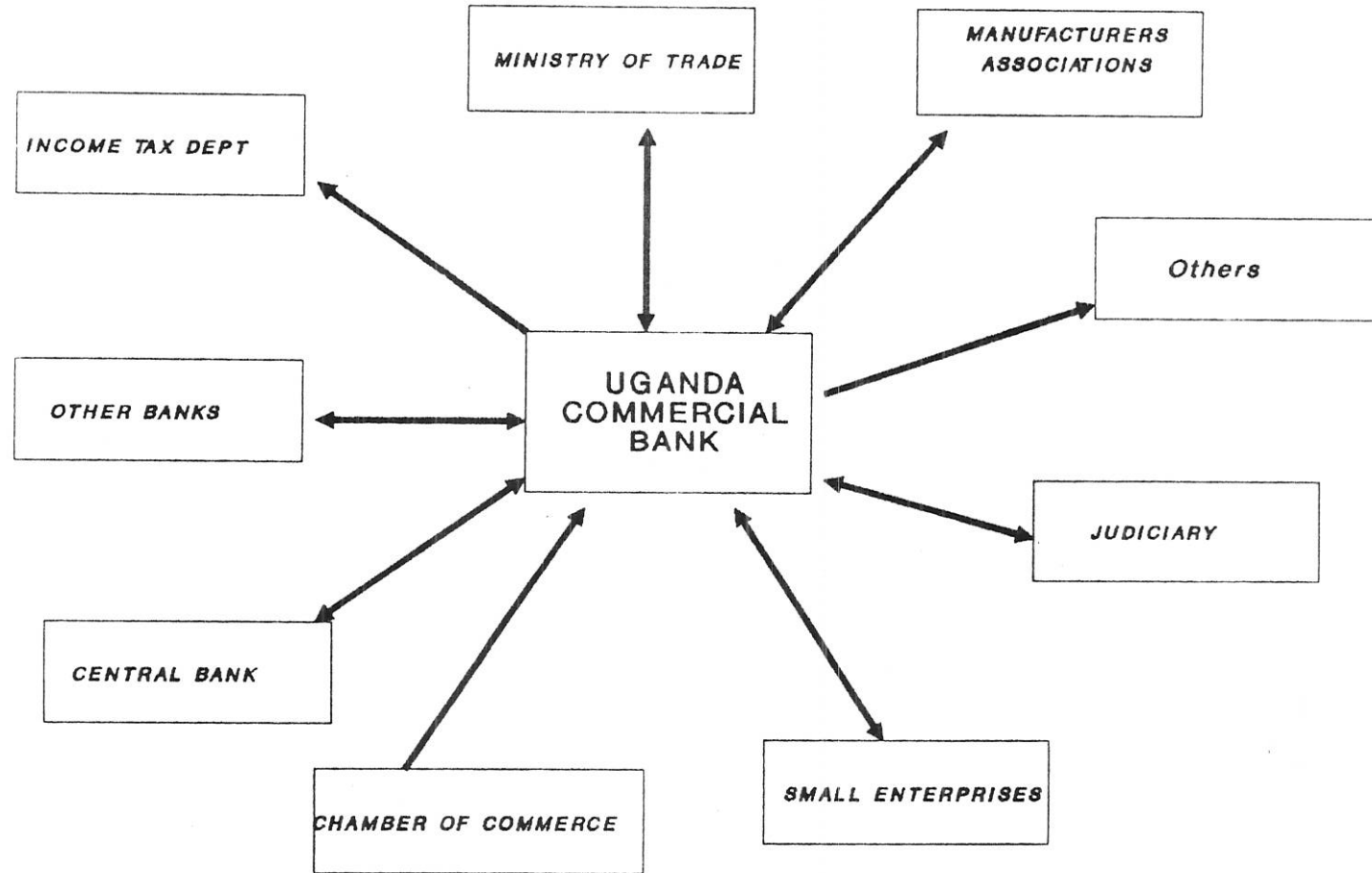


Fig 7.2

MINISTRY OF TRADE AND INDUSTRY INTERLINKS

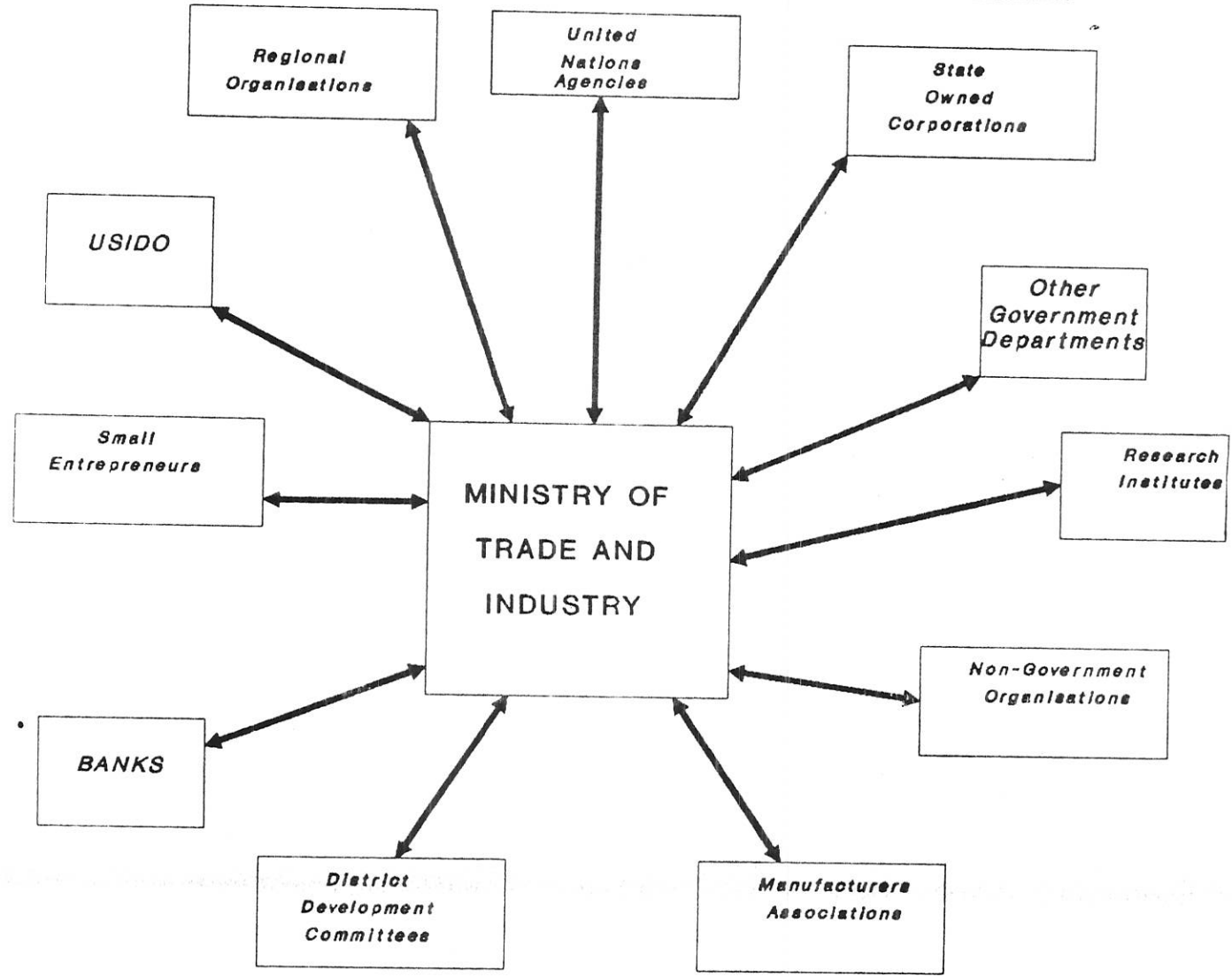


Fig 7.3

7.4.2 The Ministry of Trade and Industry

As it was noted in chapter 3 that the Ministry of Trade and Industry provide a wide range of services to the industrial sector. It has to obtain information from a wide range of sources in order to execute these services. Such sources include the research centres, departments of different government ministries, state corporations, such as Uganda Development Corporation (UDC), manufacturers associations, Central Bureau of Statistics, the Customs Department, the Central Bank, Non-government organisations, United Nations agencies operating in Uganda, etc. (see fig 7.3)

7.4.2 Information Types

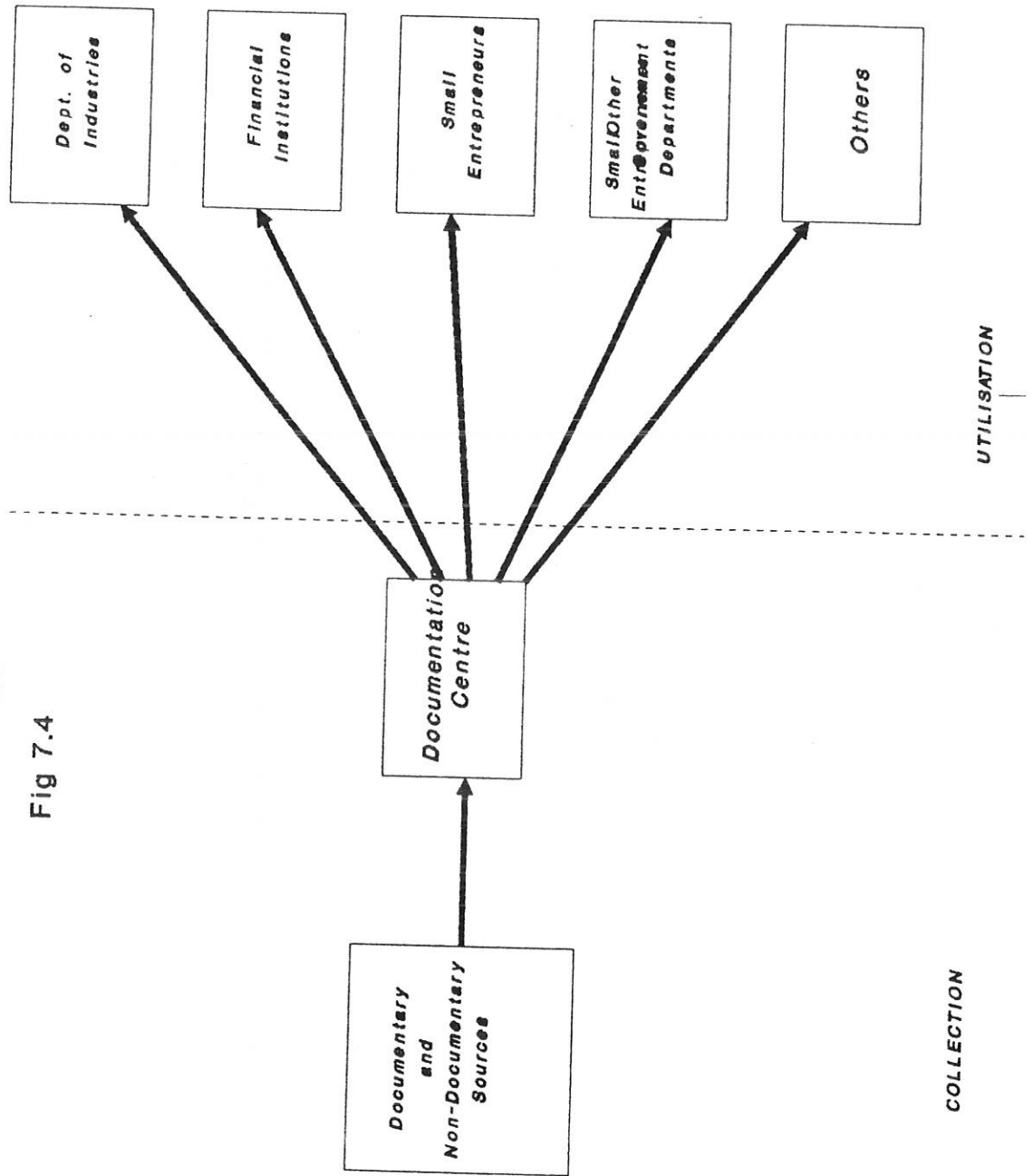
Information required for promotion and development of industries can be categorised into various types. These include:

- Technical Information
- Regulatory information
- Market information

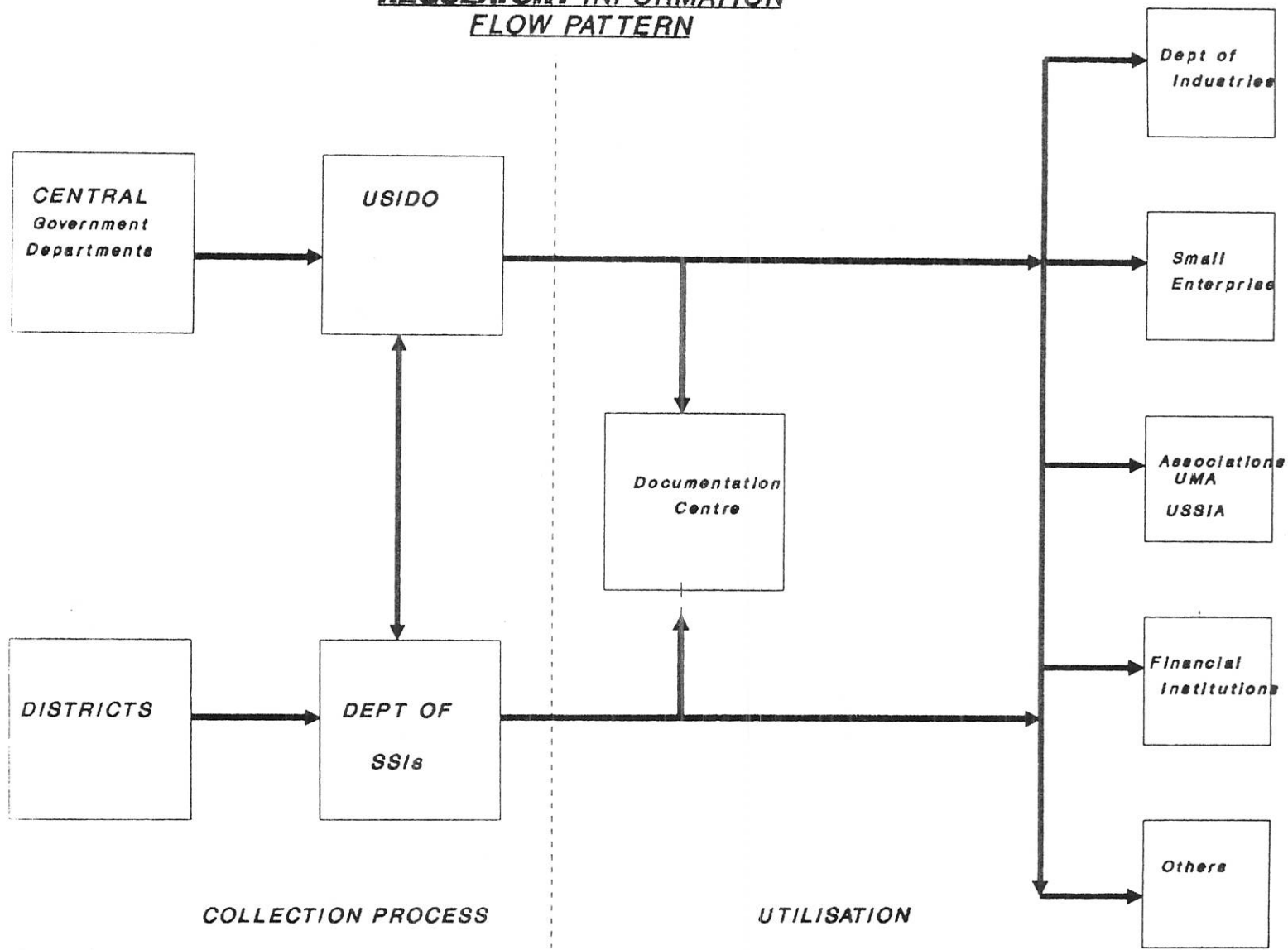
Figures 7.4 to 7.6 shows the information flow patterns concerning such information types. It is important for an information centre serving an industrial system to have full knowledge of such flows and plot its structure and services accordingly.

TECHNICAL INFORMATION
FLOW PATTERN

Fig 7.4



**REGULATORY INFORMATION
FLOW PATTERN**



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SOURCE: NEELAMEGHAN 1992

Fig 6.6

Marketing Information Flow Pattern

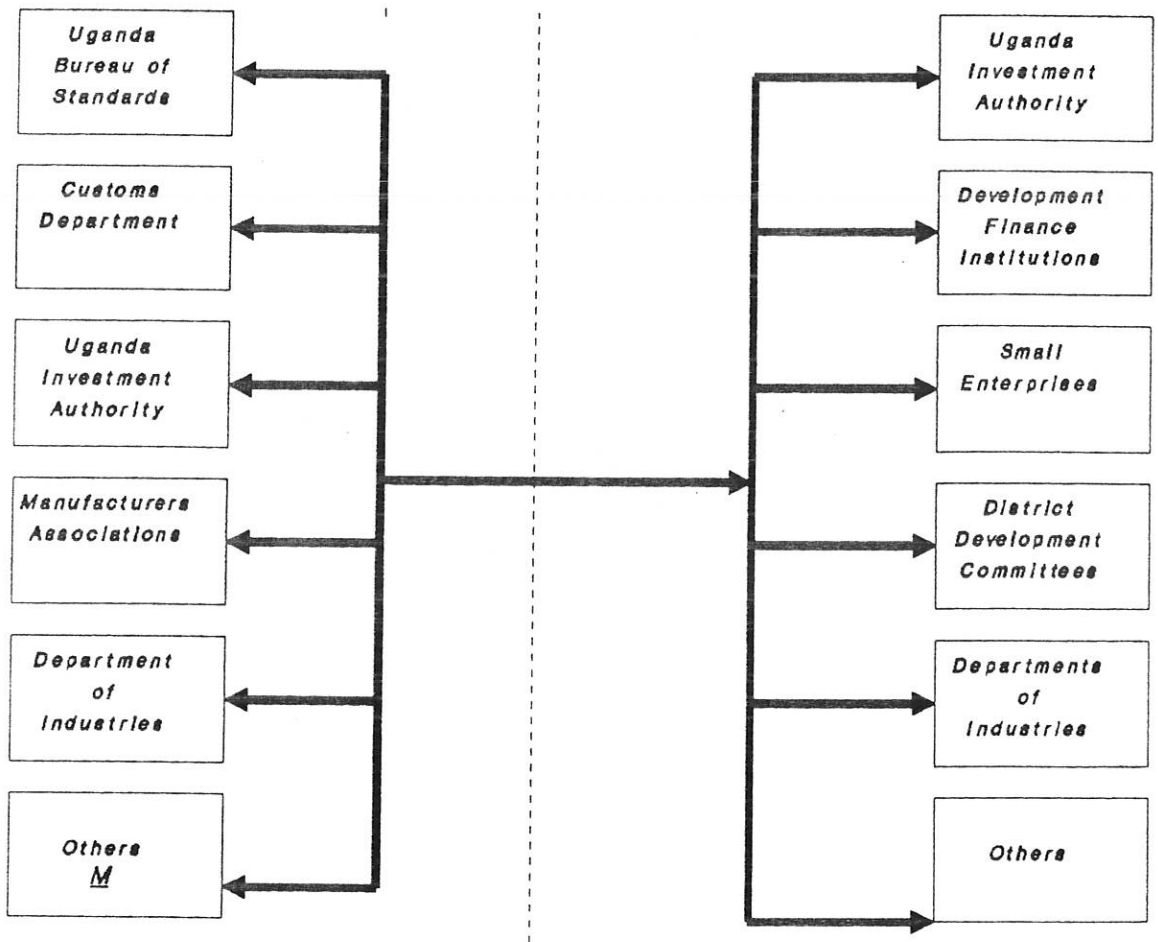


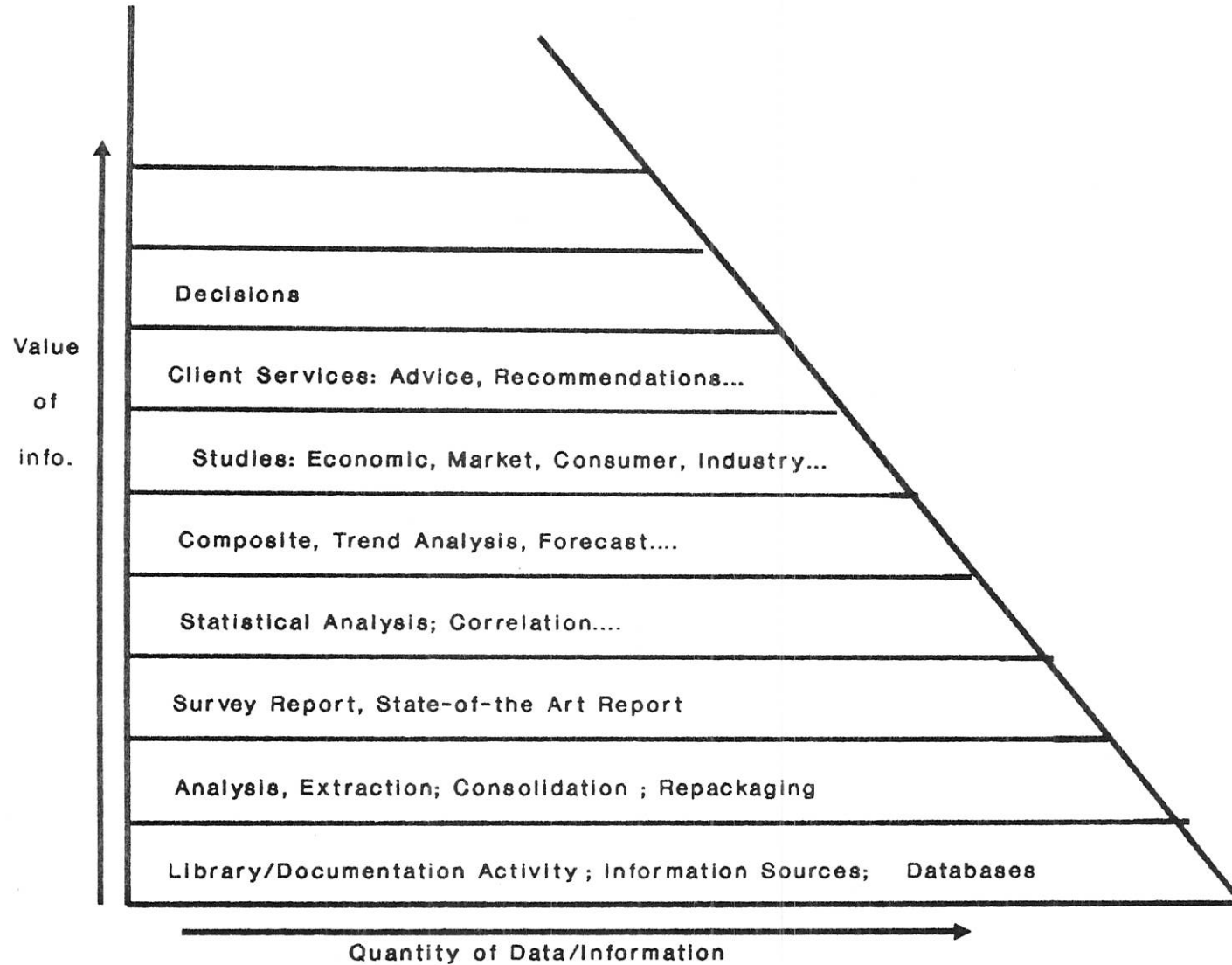
Fig. 7.6

7.5 INFORMATION HEIRARCHY

A majority of the information users in the industrial sector prefer information in a capsule form, and not documents or pieces of papers. They prefer information that has been analyzed, consolidated and repackaged, and which respond to their specific needs. In otherwords, they need information with an enhanced value. This is achieved through Information Analysis and Consolidation (IAC). With IAC, the quantity of information becomes reduced through filtering and abstraction but the quality or value in relation to ones needs is increased. More will be discussed about IAC under Specialised Services.

It should be noted that the work of IAC depends largely on the availability of the documentary sources. In view of such requirements, an information system in the industrial context can be said to assume a pyramidal structure. At the base, you have the conventional library and documentation activities of acquiring, organising and cataloguing to create an information base and making available to users documentary sources including databases and on-line catalogues. Above this, we have a range of services provided by the centre which include analysis, consolidation and repackaging of information to respond to the specific needs of particular users (see fig 7.7).

Fig.7.7 INFORMATION HIERARCHY



7.5.1 Documentary Sources

Documentary sources of an information centre can be categorised into two: formal literature and shadow or grey literature. Formal literature includes all those documents that may be acquired through normal trade channels, and/or on request from the institutions generating such materials. Shadow literature, on the other hand, covers the unpublished works, such as reports, conference/seminar papers, thesis, internal documents within an organisation, etc. These are largely outside the public domain and are not easily available.

7.5.1.1 Technical Books

These include textbooks and handbooks. They provide data and information on properties of materials, production methods, procedure, process description, formulae, etc.

7.5.1.2 Periodicals

These include technical and trade magazines. They are also good sources of information concerning suppliers, competitors, equipment, government programmes, new trends and economic developments. Advertisements and

announcements are potentially as informative as the articles. Some magazines publish annual compilations which are valuable sources of information containing buyers' guides, details of production processes and technical properties of materials. Periodicals are particularly useful to research and development personnel to keep themselves abreast of current developments in their respective areas of interest.

7.5.1.3 Norms and Specifications

These provide information on standards to be applied in the design of products and the operation of production systems, quality control and testing, etc. The standards/norms may be mandatory or advisory; and national, international, industry, or company standard in scope.

7.5.1.4 Instruction Manuals

These describe appropriate procedures for operating, trouble shooting, or repair of specific equipment. Such documents are usually supplied along with the equipment and are useful particularly to those working with machines at the floor level.

7.5.1.5 Suppliers and Trade Catalogues

These contain descriptions of machinery and other products and also on their performance, useful in selecting machinery, equipment and supplies.

7.5.1.6 Directories and Inventories

These are basically location tools, for example, to locate specialised equipment, testing facilities, etc. available for use. They may be directories of vendors, suppliers, institutions, agencies, consultants, projects, on-going research, etc.

7.5.1.7 Patents

Useful sources for information about current trends in technology in particular fields and/or countries. They are also useful in technology transfer.

7.5.1.8 Survey Reports

Provide information on trends in market, technology, industry, and location and availability of resources, etc.

7.5.1.9 Feasibility Studies

Feasibility studies, and similar documents prepared by national agencies, consultants, etc. for particular purposes, are of interest to small industries at pre-investment stage.

7.5.1.10 Regulatory Information

These include reports, manuals, guides and other forms of documentation issued by government agencies and other bodies concerned with regulatory measures relating to industrial and business activities. These include issues, such as, taxation, export and import of raw materials and finished goods, waste disposal, safety and health of workers, accident compensation, medical benefits and other similar matters.

7.5.1.11 Training Manuals

These include audio-visual materials and on-the-job training materials.

7.5.1.12 Trade Associations, Trade Fairs and Exhibitions

These are good sources of information on new products, processes and equipment, and trends in industry.

7.5.1.13 Research and Testing Laboratories

These can provide information and knowledge to solve problems and/or carry out research to find solutions to particular technical problems.

7.5.1.14 Experts

Experts available in universities, research centres, consulting firms, and in other enterprises can be good sources of advice and information.

7.5.2 Specialised Services

Besides the conventional library services, such as, lending, translation and reprographic services, a technical information service system is expected to provide a wide range of other services which may be categorised as Reference Service, Current Awareness Service, Information Analysis and Consolidation Service, among other specialised services, (see APPENDIX 1.) Below, is an attempt to illustrate some of them.

7.5.2.1 Technical Inquiry Service (TES)

TES refers to providing an information package in the form of a confidential intelligence report, forecasting report, etc. This service may relate to solving a problem, such as, setting up a production unit, or acquisition of technology. TES may cover a whole spectrum of scientific and management topics which contribute to optimal use of technology and other resources by an enterprise or an industry as a whole in the production of goods and services. TES may range from:

1. Solving operational problems;
2. Assisting in the strategic, tactical and operational planning in the enterprise, or,
3. Survey of new business opportunities.

7.5.2.2 Digests

A digest is a body of information or written matter that is classified and arranged under appropriate heads or titles (Webster). It may be on a specific topic prepared in response to a request, or it may be issued at regular intervals in anticipation of demand as a current awareness service. In case of the latter, its purpose is

mainly to supplement the information which the worker may be able to get from other sources, such as, through direct contact with the appropriate persons within or outside the organisation.

7.5.2.3 Information Analysis and Consolidation. (IAC)

IAC consists of the selection, analysis, evaluation and compression of information and data obtained from one or more sources and presenting the result in a language, style and format appropriate to the specific target users.

IAC products are of different kinds: state-of-the-art review, critical review, trend report, analysis report, feasibility report, viability report, status report, forecast report, country profile, product profile, industry profile, etc. As already noted, IAC are value added information products useful to various groups of people in an industry. These include, planners, decision makers, managers, entrepreneurs, extension personnel, etc. They sometimes obviate the need for one to read the original sources, thus, helping one to overcome a number of information barriers, (see Table 6.1, p. 214).

7.5.2.4 Selective Dissemination of Information (SDI)

This is a current awareness service through which an information user can expect to receive regular notifications of the new literature and data pertaining to his/her areas of interest. A user's areas of interest are expressed in a "User Profile" file. This specifies the topics in which the user has an interest.

In designing an SDI service:

1. A description of the user's areas of interests is prepared and stored in the user profile file;
2. At regular intervals, records of the new documents received by the information centre are compared with those in the information user profile;
3. Bibliographic details of the document corresponding to the users' profile are output and sent to the user.

SDI is distinguishable from other current awareness services in that it is a personalised service directed toward an individual user or a group of users, whereas, most of the other services are on broad subject areas. It is a continuous information service and may provide a continuous flow of information unless the user decides to terminate or change his profile.

7.5.2.5 Decision Support System (DSS)

This is an information service designed to assist decision making. It may be emphasised here that DSS is meant to support decision making rather than provide answers to problems, not even to provide a predefined sequence of analysis.

From a DSS, the decision maker retrieves data and information from the 'knowledge base' and can use that information to test for alternative solutions. The system is interactive in nature, providing a dialogue between the user and the system. It may also provide leads to other information sources.

Areas where DDS may be most useful include, selection of a vendor or an equipment, hiring a new supervisor, or entry into a new market,

7.5.2.6 Expert System

This is a computer application system that can guide a user to handle an ill-structured task or problem, which require experience and specialised knowledge, that is, expertise. By using the Expert System, a non-expert can achieve performance comparable to that of an expert in that particular domain, (Davis 1975).

The system is characterised as "knowledge base" or "artificial intelligence". A user, who is a non-expert supplies the system with a particular set of parameters. The system searches its knowledge base for the same parameters and provide a response, as the case may be. It can even provide for an interactive dialogue with the user to elicit more information.

7.6 OBJECT ORIENTED DATABASES

Object Oriented Database refer largely to a computer based information service system. In such a system, data and information on the relevant parameters are organised in form of a database. The computer system assists in the processing, storage, retrieval and dissemination of this information.

In the industrial context, such data may cover parameters like market, local and/or foreign, imports and exports, economic conditions and policies of countries, information on machinery and other industry inputs, etc.

Computer technology, as already noted, is superior in information processing, especially in view of its storage capacity, ability to process data at great speed, to provide multiple access to data files, to work tirelessly, and ability to communicate information in real time.

The challenge facing information workers today is to prevail upon decision makers in government as well as enterprises in persuading them to switch to computer based systems in the management of their information services. This will make it possible for the information officers to improve on the poor image they have so far cut with their organisations by providing value-added services as those discussed above under IAC.

In summary, it can be said that computer technology has become a vital component in the management of information systems in industry/organisations. It is crucial in the future well being of the information industry as a whole, especially in as far as it helps the information personnel to shift from a weak position of "custodians of information" to becoming an integral part of the management system in an industry.

7.6.1 Prototype database

As an illustration, a prototype database has been prepared to help demonstrate the working of a computer-based system. It consists of series of sub-databases that have been integrated into one database, "The Addis Database".

7.7 THE ADDIS DATABASE

Addis database is a prototype database designed bearing in mind the information needs of an industrialist, an investor, or a businessman. It therefore, focuses on those issues considered most pertinent to those engaged in promoting the industrial sector. It has five databases, namely:

Machinery Database	MACH DATABASE
Expert Database	CSLT DATABASE
Research Institutes Database	INST DATABASE
Financial institutions Database	BANK BATABASE

The databases have been designed using a software known as CDS/ISIS, version 3.1. (See APPENDIX VI for database outputs).

7.7.1 Machinery Database

This database attempts to give the salient features of individual machines and other technologies in the country. It includes information about the local users and local agents in the individual technologies, It also includes information about the observations made by the different users of the technology in question, including dealers and local experts. This database could be a good reference point for anyone intending to adopt a given technology in question for a production purpose.

7.7.2 Expert Database

This database gives a comprehensive profile of the experts available in the country in the varying disciplines together with the accomplishments made by them especially in the field of consultancy.

7.7.3 Institutions Database

This is a profile of the "Centres of Excellence" as well as consultancy firms in the country. The database highlights the areas of specialisation by the individual centres.

7.7.4 Financial Institutions Database

Bearing in mind the fact that finance is one of the biggest problems facing potential investors, this database brings to surface the lending policies of individual financial institutions in the country.

7.8 CDS/ISIS SOFTWARE

This is a menu driven information storage and retrieval system software. It is designed specifically for the computerised management of structured textual databases. CDS/ISIS is able to manipulate an unlimited number of databases, each of which may consist of completely different elements. It has powerful index generating and retrieval features. It also has a multi user facility which makes it workable in a networking environment. With the help of ISO 2709 format, CDS/ISIS can exchange data easily with databases using other software packages. Its capabilities can be enhanced with programmes written in CDS/ISIS Pascal.

CHAPTER 8

CONCLUSION AND RECOMMENDATIONS

In the preceding chapters, I have tried to demonstrate the role data and information can play in the economic development of Uganda, the industrial sector in particular. I examined the state of the manufacturing sector in the country, its potentials and constraints. According to the survey carried out for this research exercise, it became clear that the information problem sticks out very prominently among the many problems faced by the manufacturing industry in Uganda. This is particularly true with regard to the small scale industries (SSIs).

In chapter 5, I explored the state and structure of the present industrial information system in Uganda. No doubt it can be described as pathetic. The linkages between research and training institutes/centres and industry also leave a lot to be desired. In Chapter 7, I discuss the features of a viable technical information system. The structure, materials and services were probed in detail.

It is quite evident from these discussions that there is an urgent need for the Government of Uganda to demonstrate its role in the provision of scientific, technical and socio-economic information to those involved in promoting industrialisation.

It was reported in the earlier chapters that there has been attempts in the past to address the issue of technical information in Uganda by the government, assisted by the international community. These efforts were, however, unsuccessful. In this era of privatisation, such failures may be interpreted as an example of the incompetence and inviability of public institutions. I must, however, emphasise that information is a key resource in the promotion of industrialisation and, therefore, represents one of those institutions in the country that cannot be left wholly in the hands of the private sector. We should, instead, use the experience so far acquired to work out new strategies and/or devise more safeguards to check the recurrence of such failures in the future.

8.1 RECOMMENDATIONS

8.1.1 The National Scientific, Technical and Industrial Information Centre (NSTIIC)

In view of the issues raised above, I would recommend it strongly that there is need for the Government of Uganda to establish a National Scientific, Technical and Industrial Information Centre, (NSTIIC) whose services and activities must be wide ranging and comprehensive, as those mentioned in Appendix I. The service must be based on a network linking institutions and information sources, both vertically and horizontally. Horizontally, it should provide inter-linkages for all institutions, agencies, organisations etc., concerned with industrialisation in

the country. (see fig. 8.1 and 8.2). Vertically, it must cut through all the hierarchical structures going down to the grass-root or the smallest cell of the industrial structure.

8.1.1.1 Location of NSTIIC

NSTIIC may be located at the library of the Uganda Polytechnic Kyambogo. As already mentioned, the library at UPK has a functional building located at the leading industrial zone in the country. It enjoys proximity to the capital with the largest concentration of business and manufacturing activities in Uganda. It is also attached to a leading scientific and technical training college.

Alternatively, the functions of the National Documentation Centre at the Uganda Management Institute (UMI), which is one of the two institutions in the country with legal deposit rights, may be strengthened and extended to cover industrial and business information services.

8.1.1.2 Administration of NSTIIC

It may be noted that UPK is, first and foremost, a training institution, and it is subservient to the Ministry of Education rather than to the Ministry of Trade and Industry. Thus, entrusting the administration of NSTIIC to UPK may lead to some compromise of the activities of the latter as an industrial information centre. It is

therefore recommended here that the administration of NSTIIC be in the hands of the Uganda National Council for Science and Technology (NCST).

8.1.1.3 Finance

For the smooth operation of NSTIIC, it is recommended that the Centre be provided with an independent budget line from the National Treasury.

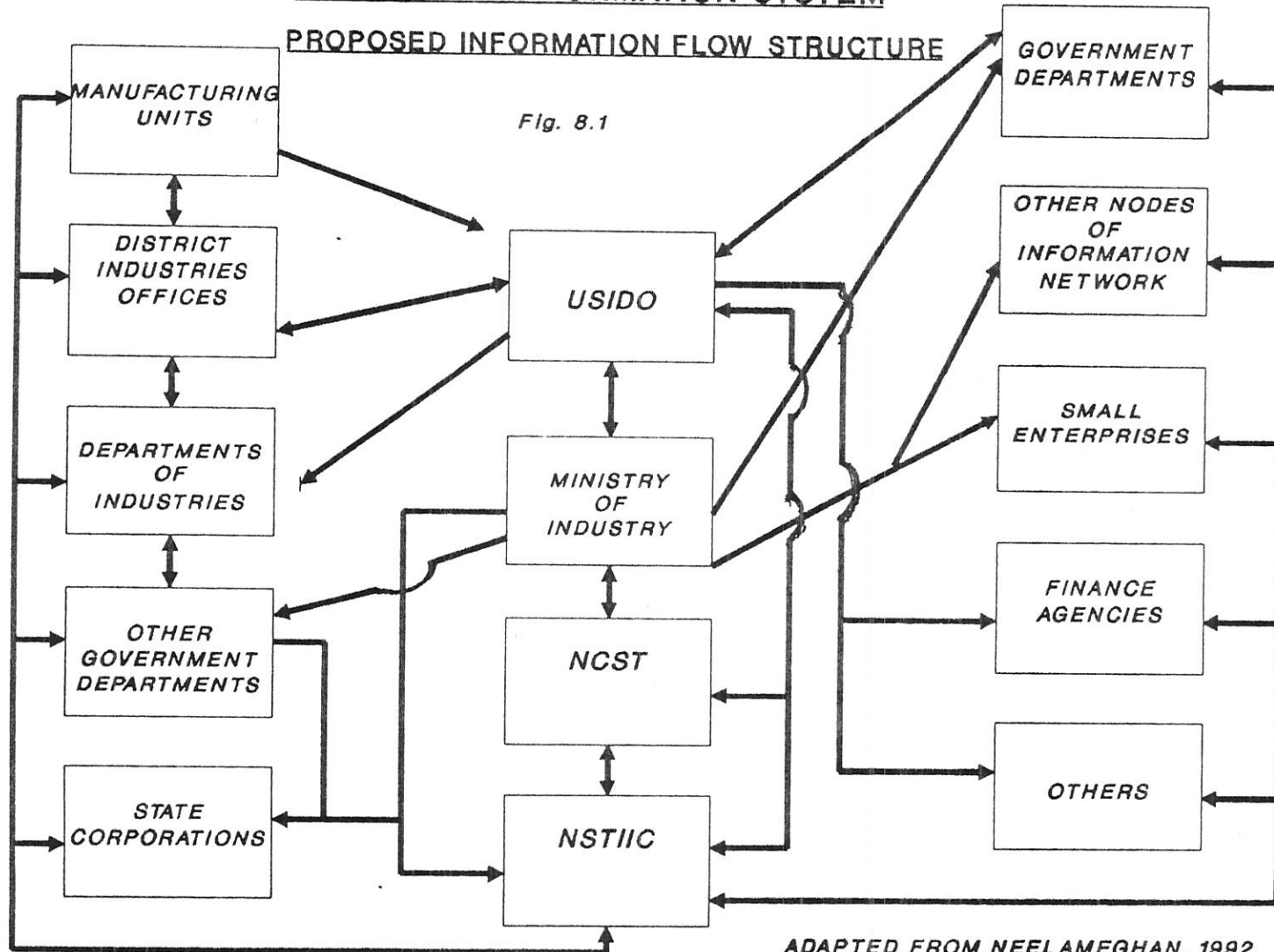
8.1.1.4 Legal Depository Rights

There are two institutions that are charged with the duty of administering the legal deposit rights in the country, namely, Makerere University Library and the National Documentation Centre. It is my recommendation here that, a mechanism be created to provide for the transfer of such rights from one of these institution to NSTIIC.

INDUSTRIAL INFORMATION SYSTEM

PROPOSED INFORMATION FLOW STRUCTURE

Fig. 8.1



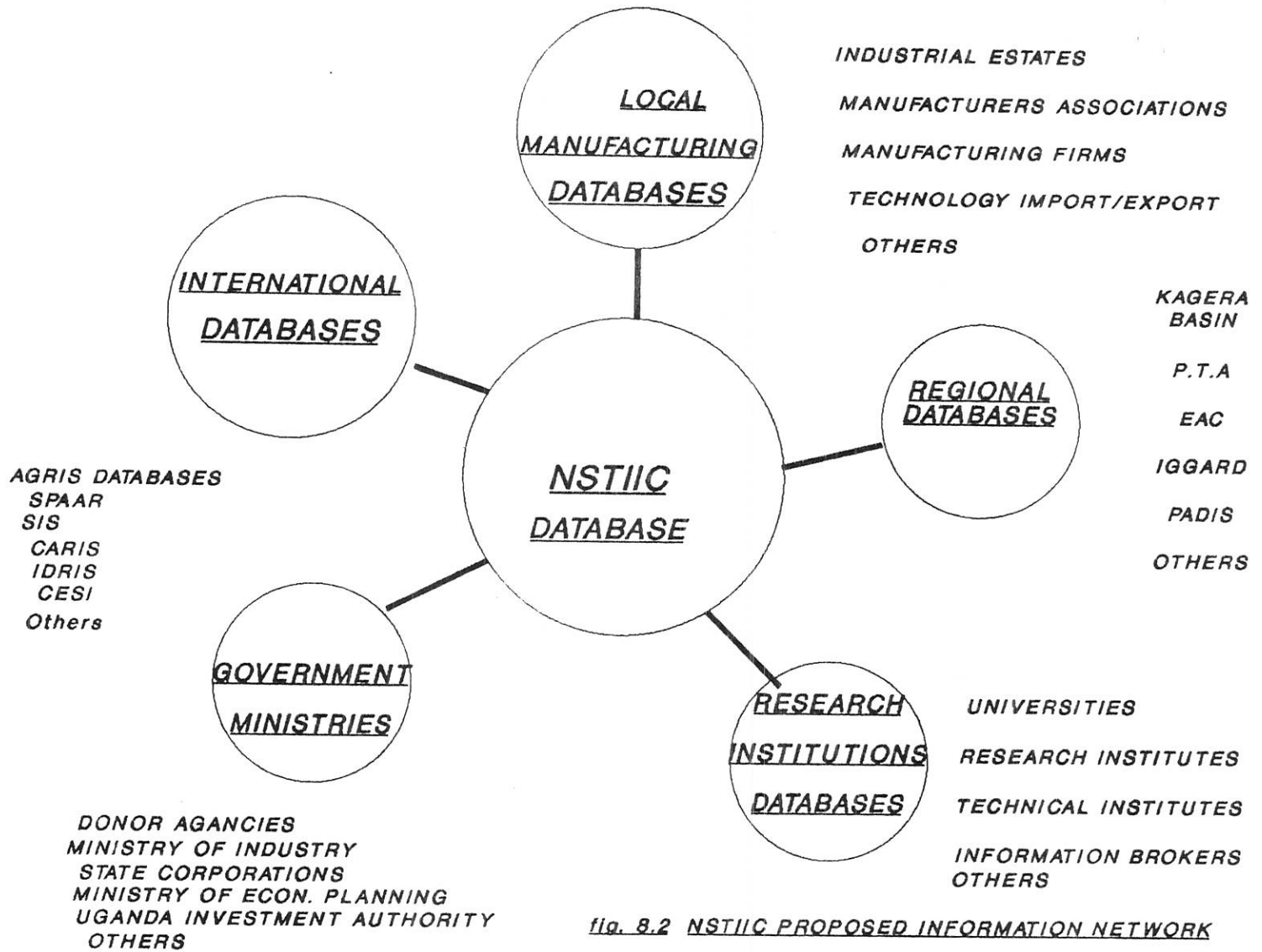


fig. 8.2 NSTIIC PROPOSED INFORMATION NETWORK

8.2 ADDITIONAL RECOMMENDATIONS

The working of NSTIIC is bound to be influenced greatly by the environment, especially the government policies, strategies and programmes. It can also be influenced by the general attitude of the public, in particular, manufacturers, planners and decision makers. Bearing this in mind, the following additional recommendations are suggested. There is need:

1. To adopt policies, strategies and programmes at a national level that treat data and information as a vital resource in the socio-economic development of the country and where the National Information Policy form part of the National Development Policy. This implies that the national information resources should be seen as an integral part of the national development plans and strategies.
2. To institute at national level a programme to sensitise planners, decision makers and all those in national leadership to accept data and information as essential national development resources. They need to be made aware that a healthy information and informatics industry is a requisite to national economic growth.

3. To institute, in line with the sensitisation programme, a programme where high level technical staff in government ministries, departments, state corporations, etc. are able to liaise with and assist decision makers, policy makers and top-level executives, to orient them to the information and data sources pertinent to their areas of activity, to effect methods of accessing and utilising the information and data sources, services and products, and to ensure that national or sectoral information sources and services are effectively linked and made easily accessible and conveniently usable to such officials.
4. To give a priority status to the information component in all sectoral, national and sub-national development plans and programmes by creating for them independent budget lines.
5. To institute a policy at national level that supports the organisation and management of public information sources in a way that ensures access by all categories of users. This may be effected by encouraging development of information networks, resource-sharing programmes, information services and document delivery services, etc., appropriate to different user groups.

6. To devise a programme that should ensure high- quality information and data management by all firms, departments, etc., in the country. This can be achieved by encouraging firms to establish information units, where this may be possible, and provide with trained personnel together with the necessary tools and equipment.

7. To encourage all departments and organisations in the country to endorse the principle of freedom of access to information and information sources without jeopardising national security, corporate and personal privacy, property rights, etc.

8. To share the responsibility of developing national scientific, technical and industrial information infrastructure with a number of appropriate institutions through the allocation of tasks and programmes so that each one builds up an information resource centre with databases and data-banks, in areas where each may be enjoying a comparative advantage. These information centres may then be brought together through networking and resource sharing.

9. To evolve appropriate legislation concerning national registration and disposition of all data and information sources and materials generated in the country so as to facilitate the capturing, recording, processing and disseminating such information.

10. To adopt a programme at national level that should ensure proper monitoring of flow of non-traditional information, data, technology and knowledge into the country; for example, via multinational and bilateral agreements, import and export of goods and services, consultants, etc., and provide for ways by which information centres may gain access to such information.

11. To evolve programmes at national level aimed at creating, updating and maintaining of information tools and products that facilitate the identification, selection and location of information and data sources in the country including databases, information and data systems and services, on-going projects, contractual arrangements, technology transfer agreements, directories, inventories, union catalogues and lists, etc., and to institute measures that would facilitate the collection, recording, exchange and processing of such information from all appropriate institutions, agencies, programmes and projects.

12. To encourage both public and private sectors to improve and upgrade the quality of information and data generated by their organisations, both in content and physical form.
13. To provide for appropriate registrations and administrative measures to facilitate the improvement of the collection, validation, organisation, computerisation and timely dissemination of numerical and statistical data generated in the country.
14. To raise the perception of the Ugandan people regarding the value and utility of data and information in all areas of their activities, the manufacturing sector in particular.
15. To encourage and support at national level measures leading periodical study and analysis of information and data needs of manufacturers, the information seeking behaviour as well as attitudes towards information use in their respective areas of concern; and also to assist them in enhancing their ability to use information and information sources effectively.
16. To encourage and give support to interaction with and participation in global, international and regional information systems, programmes and activities that are conducive to the development of Uganda's national information systems

and services; and also the active participation of information specialists and institutions in appropriate regional and international meetings for exchange of information and experiences on recent developments in information systems and technologies.

18. To encourage utilisation of scientific, technical and economic knowledge emanating from those countries with whom Uganda share a similar background through purchase or promotion of exchange schemes for such literature.

19. To encourage national participation in regional and international information networks by inputting data and information generated in the country in those systems. This should be done in the spirit of cooperation and coordination in information activities with other countries so as to encourage information exchange. Thus, Uganda, through the proposed National Scientific, Technical and Industrial Information Centre, should endeavour to promote the activities of organisations such as Pan African Documentation System, (PADIS), based at Addis Ababa; PTA (TINET) based at Lusaka; international information systems, such as, AGRIS, UNESCO/PGI, etc.

20. To promote compatible standards and norms among systems and services through formulation and adoption of agreements on procedures, tools and guidelines to be followed by the different information centres in the country. Such standards may include CCF, MARC, ISO 2709 etc., for data exchange, etc. which are now being applied widely in the information systems of many countries.

21. To implement the recommendation concerning the formation of an autonomous body in the country to deal with the promotion and development of the small industries and also to coordinate the activities of all those institutions, agencies, etc. in the country, involved in the development of this sector, including the information personnel.

22. To strengthen the bond between the research centres and industry, more specifically, the small industries. This can be achieved through seminars, open forums, joint exhibitions and trade fairs, and formal consultancy service by research centres to industry

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APPENDIX I
INFORMATION SERVICES OF A SPECIALISED INFORMATION CENTRE

INFORMATION SERVICE TYPE	Dominant User Groups			
	TM	R&D	MM	TECH
Reference Services				
Reference service	Y	Y	Y	Y
Retrospective search	Y	Y	Y	Y
Technical enquiry service	Y	Y	Y	Y
Clearing house service	Y	Y	Y	Y
Current Awareness Services				
Current papers notification	Y	Y	Y	Y
Research in progress notification		Y	Y	
Selective dissemination (SDI)	Y	Y	Y	Y
Current events notification	Y	Y	Y	Y
Newsbrief and bulletins	Y		Y	Y
Patents notification	Y	Y	Y	Y
Standards information		Y	Y	Y
Information Analysis & Consolidation				
Research abstracts	Y	Y	Y	
Digest for managers	Y		Y	
Technical digests	Y	Y	Y	
Digest for technicians				Y
Numerical data service		Y	Y	
Statistical digest	Y		Y	
Executive information service	Y		Y	
Products/Process/Innovation Info.		Y	Y	Y
Specialised Services				
Market research/intelligence	Y		Y	
Forecast/Trend reports	Y	Y	Y	
Company profiles	Y		Y	
Contract & tender notices	Y		Y	
Environmental scanning	Y	Y	Y	
Technology transfer information	Y	Y	Y	
Decision support system	Y	Y	Y	
Expert systems	Y	Y	Y	
Common Services				
Library service				
Document delivery				
Document reproduction				
Translation				
Editorial/Technical writing				
Publication Services				
Organisation of seminars/exhibitions				

TM = Top Managers; R&D = Research and Development Group
MM = Middle Mngers; TECH = Technicians/Operators

APPENDIX II

SERVICES RENDERED BY THE INDUSTRIAL INFORMATION SYSTEMS
IN UGANDA

	1	2	3	4	5	6	7	8
Reference Service	Y	Y	Y	Y	Y	Y	Y	Y
Reference Service	Y	Y	Y	Y	Y	Y	Y	
Retrospective search		Y					Y	Y
Technical Inquiry Service		Y	Y		Y		Y	
Clearing House Service		Y	Y			Y		
Referral service	Y	Y	Y	Y	Y	Y	Y	Y
Current Awareness Service								
SDI		Y				Y		
Current Events Notification		Y			Y			Y
Newbriefs			Y					Y
Research in progress			Y		Y			
Information Analysis and Consolidation								
Research Abastract		Y	Y					
Digest to Managers		Y	Y					
Technical Digest		Y	Y		Y			
Statistical Digest		Y	Y		Y			
Common Services								
Document Reproduction		Y	Y		Y	Y	Y	Y
Organisation of seminars		Y	Y		Y	Y	Y	Y
Editorial and Technical Writing					Y			Y
Publication services								

Key:

- 1: Industrial Technical Information Unit (ITIU)
- 2: Technical Information Service (TIS)
- 3: Trade Information Centre (TIC)
- 4: Uganda Technical Information Service (UTIS)
- 5: UMA Consultancy and Information Service (UMACIS)
- 6: UMA Information Centre (UMAIC)
- 7: Uganda Small Scale Industries Association (USSIA)
- 8: Management Training and Advisory Centre (MTAC)

APPENDIX III

Problem areas in the SSE sector as identified by a study carried out the Commonwealth Secretariate jointly with Ministry of Planning and Economic Development, 1989,

Improving fabrication practices:

- a. Saving in steel;
- b. Welding improvement;
- c. Use of fixtures;
- d. Standardisation of steel sections for different uses;

Fabrication of Maize Mills, ie hullers:

- a. Prototyping modern design machines;
- b. Energy consumption improvement;
- c. Standardisation of components and interchangeability belts, bearings, etc.;
- d Sizing.

Woodworking:

- a. Seasoning of wood;
- b. Joinery design;
- c. Exposure to simple designs for standard furniture, doors and windows;
- d. Improved tools.

Bakeries:

- a. More efficient ovens - electricity being very expensive;
- b. Mixing equipment;
- c. Hygiene.

Builders hardware:

- a. Simple mechanisation of manufacture;
- b. New design propagation;
- c. Finishing/electroplating, etc.

Brick and Tile Making:

- a. Testing clay and suggesting the products to be made;
- b. Simple mechanisation for brick making including mixing and forming;
- c. Simple but more efficient burning practices, ie. energy saving;
- d. Hollow bricks - self aligning bricks.

Lime kiln/lime as building material.

Metal Working Group/Sheet Metal Working:

- a. Choice of materials;
- b. Supply/assistance in process sheets, drawing based manufacture;
- c. Heat treatment - needs and techniques;
- d. Standardisation of some components/metal testing;
- e. Exposure to simple machine tools, finishing techniques/use of jigs and fixtures;
- f. Input linkages - forging/foundry;
- g. Use of tools, press, etc.

FOUNDRY:

- a. Examine energy needs - oil/electricity may be expensive for (gray) iron castings - use of coal - cost/benefit study of imported coal;
- b. Foundry practices - grading of castings for different applications - ladle additions, use of (ferro) silicon, etc.
- c. Choose optimum sizes of melting equipment having regard to nature of castings;
- d. Design (moulds) - savings in recovery of material;
- e. Heat treatment.

Recovery of Animal Products:

- a. Improvement in flaying;
- b. Preservation of hides and skins;
- c. Recovery of by-products;
- d. Use of horns, hoofs and bones;
- e. Tallow recovery;
- f. Quality of primary tanning;
- g. Finishing of leather;
- h. Use of leather - product design;
- i. Improved tools for shoe making.

Fibre base produce:

- a. Identification of fibre and uses;
- b. Fibre extraction;
- c. By-product - eg sisal for medicinal use.

Processing of fruit/vegetables:

- a. Techniques and equipment suitable for local processing;
- b. Packaging;
- c. Preservation;
- d. Standards.

Processing of oil seeds:

- a. Scale of operations - linkage to availability - primary processing;
- b. Secondary processing - soap recovery;
- c. Use of extractions - value additions;
- d. Refining requirements;
- e. Packaging.

Biomass energy development:

- a. (Briquetting) - suitable materials and techniques;
- b. Improved burning system;
- c. Use of bagasse - recovery of surplus;
- d. Wood gas;
- e. Improvement in techniques of charcoal making.

APPENDIX IV

INVESTMENT OPPORTUNITIES IN THE MANUFACTURING SECTOR (Source: A guide to investing in Uganda, 1993)

Milk Products:

- milk - pasteurised, sterilised
- Butter, cheese
- UHT milk
- Yogurt
- Dry milk (powdered)

Paper products

- Newsprint from bagasse, papyrus and other grasses,
- Bond paper,
- Toilet paper.
- Machine rolls,
- Computer paper,
- Typing paper,
- Duplicating paper,
- Scholastic paper materials.

Packaging

- Paper bags,
- Kraft paper,
- Polythene wrapping and plastic containers;
- Wooded frames and corrugated boxes,
- Tins(recycled)
- Cooking oil packaging (plastic or tin)
- Paint cans.

Rubber products

- Tyre and tubes,
- Rubber products,
- Other rubber products.

Glass

- Container glass-bottles, jars, drinking glasses, etc.
- Sheet glass

Iron and Steel Industry

- Assorted steel products, eg. tool boxes;
- Steel billets,
- Fabricated foundry.

Electrical and communications equipment

Wires,
Sockets, switches,
Dry cell batteries,
Telephone receivers,
Other electrical and electronic accessories.

Food preservation

Coolers,
Cold storage, processing and vacuum packing of
vegetables, pineapples, passion fruits, etc.
Milling and packaging of millet, sorghum, wheat,
sorghum, and other cereals
Central and regional facilities for major cereals.

Food processing and confectionary products

Roasted groundnuts, potato chips, French fries,
chicken, fish and other high protein foods,
Matooke processing,
Bread, cakes, biscuits,
Corn flakes, breakfast cereals.

Printing Industry

Colour printing,
Specialised printing,
Photographic materials,
Screen printing.

Motor vehicle spare parts and other accessories

Brake pads, clutch plates,
Lorry springs,
Vehicle bodies,
Other spares.

Mining industry

Salt and related products, ie. chlorine,
Lime,
Fertilisers (phosphates), nitrates, for agricultural
use,
Biological fertilisers,
Biogas.

Agricultural chemicals and veterinary drugs

agicides,
pesticides,
animal drugs,

Leather Products

Hand bags,
Brief cases,
Belts,
Shoes,
Handcrafts.

Fibre products

Carpets and rugs,
Handcrafts,
Synthetic fibre products - rayon, etc.
Cotton textiles,
Silk textiles.

Wood products

High-quality furniture for export markets,
Soft and hard boards,
Plywood,
Wooden toys

Plastic products

Food containers and other containers,
Domestic ware,
Toys,
Drinking straws.

APPENDIX V

GUIDING QUESTIONS IN THE SURVEY

MANUFACTURING FIRMS

1. What is the name of your firm?
2. What type of organisation it is, ie. whether one man business, partnership, limited company, joint venture, multinational, etc.?
3. What kind of products are being produced?
4. What is the main use of the product(s) being produced, ie. food product, industrial input, agricultural input, etc.?
5. List the problems faced by your firm in order of importance to you?
6. Among the Research Centres listed below, indicate those which are known to you?
7. Among the Research Centres listed, indicate those you have ever visited in connection with your business.
8. Are you aware of any research that is being done, or was done in the past that could be of interest to your firm.
9. Have you ever contacted any of the above research centre on matters relating to problems faced by your firm?
10. If yes, how was the contact made, eg. mail, telephone, personal visit, etc.?
11. Among the information centres listed, indicate those which are known to you?
12. Indicate those you have ever visited, the problem you had at hand, whether service was satisfactory or not, and if not satisfactory, explain why?
13. Have you ever been in touch with with a private consultancy firm?
14. If yes mention those you have ever visited, the problem at hand, and whether service was satisfactory or not.

15. An effective information system may be expected to provide a number of the following services, and at a reasonable cost. (a list of services was provided). Bearing in mind such services, how would you evaluate the current industrial information system in the country?
16. Which services would you consider most important to a manufacturer?
17. What are your view about proposing a government supported national industrial inforomation service system?

RESEARCH CENTRES

1. What is the name of the Research Centre?
2. What is the name of the parent body?
3. What kind of research is being conducted?
4. What is the size of your reserach team, eg. qualifications and status?
5. How much do you spend on research annually?
6. What research findings has the research centre made in the last ten years?
7. Who are the beneficiaries of your research findings?
8. How or fro where do the research problems originate?
9. If your research problem originate from the members of the public, how are they communicated the the research centre?
10. In your view, how effective is this mode of communication?
11. How many queries do you receive a month
12. Give a statistical record of thr queries you have received over the last five years.
13. How are your findings communicated the users?
14. In your view, how effective is this mode of communication?

15. To what extent are your findings being applied in the country?
16. Do you collaborate with any research institute(s) within or outside the country?
17. What kind of collaboration?
18. Do you maintain an information centre/library at your research centre?
19. How would you assess the contribution of research centres toward the current economic, social, technological, etc. development of the country?

INFORMATION CENTRES

1. What is the name of the information centre/library?
2. What is the name of the parent body?
3. What are the objectives of the parent body?
4. Mention the date the information centre/library was established.
5. What type of information services are being provided by your centre?
6. Who are the main users of your centre?
7. What is the total number of registered users?
8. Enumerate the kind of literature you have in your centre.
9. Describe the size and structure of your staff, eg. qualifications, status, etc,
10. Is your centre with any computer facilities?
11. If it is so, what uses do you make of these facilities?
12. Are you linked to any database within or outside the country?
13. If so, name them.

APPENDIX VI

DATABASE OUTPUTS

ADDIS DATABASE: THE DISPLAY FORMAT

```

"MFN "mfn(3)/if v2:'spec' then "NAME: "V10/"NATIONALITY:
"V70,X5,"DATE OF BIRTH: "V75,X5,"SEX: "V80"PHYSICAL ADDRESS:
"V85^A,X3,V85^B/"POST OFFICE ADDRESS: "/D90,(v90^A,', 'V90^B/X10,
"PHONE: "V90^C/X10,"TELEX: "V90^D/X10,"FAX: "V90^E/)%#"CUR
RENT POST: "X6,V95%#"EMPLOYER: "X10,V100(3)%#"QUALIFICATIONS:
"D105/(C5,v105^a,x10,V105^B,X10,V105^C/)%#"WORK EXPERIENCE:
"D833/(v833^A,C10,V833^B(0,10),C10,V833^C(0,10),C10,V833^D(0,10)/)%
#"SPECIALISATION: "C20,V832^A/C20,V832^B/C20,V832^C%#"PREVIOUS
CONSULTANCY: "D135/(C5,V135^A,C20,V135^B(0,19)/V135^C(20,19)/)%
#"LANGUAGES: "d525,(C20,V525^A,X5,V525^B/)%#"REFEREES:
"d145/(c10,v145^A,c10,V145^C,c10,V145^B/) fi,if v2:'mach' then
"Name: "c30,v10/#"MACHINE CODE: "C30,v170#"CAPACITY: "C30,v175#
"BLADE: "C30,v180#"WORKING SURFACE TABLE: "C30,v185/"BLADE SPEED
: "C30,v190(0,30)%"FEED: "C30,V195#"MOTOR: "C30,V200%#"SHUTTLE FEED
TABLE: "V205#"DOMESTIC SHIPPING WEIGHT: "C30,V210(0,19)%#"WILL
PUSH WORK: "C20,V215(0,19)%#"WILL PUSH WEIGHT: "C30,V220(0,19)%#"
GAUGING LENGHT: "C20,V225(0,19)%"HEIGHT: FLOOR TO TABLE: "C30,V230
#"AUTOMATIC LOADING TRACK: "C20,V240#"NOTABLE FEATURES:
"C25,V245^A(0,24)#C25,V245^B(0,24)#C25,V245^C(0,24)#C25,V245^D(0,
24)#C25,V245^E(0,24)#C25,V245^F(0,24)#C25,V245^G(0,24)#C25,V245^H
(0,24)#C25,V245^I(0,24)%"LOCAL USERS: "D280/(C25,V280^A/C25,
V280^B/C25,V280^C/#)%"LOCAL AGENTS: "D285/(C25,V285^
A/C25,V285^B/C25,V285^C/#)%#"COMMENTARY: "C20,V250(0,19)/#"KEY
WORDS: "C20,MHL,V160(0,19) fi,if v2:'bank' then "CORPORATE
NAME: "C20,V10#"ADDRESS: "C20,V390#"C20, LOCATION: "C20,V410#
"OPERATIONAL AREAS: "C20,V315(0,20)%"LENDING POLICY: "C20,
V316^A(0,19)/#C20,V316^B(0,19)/#C20,V316^C(0,19)/#C20,V316^D(0,19
)/#C20,V316^E(0,19)/#C20,V316^F(0,19)/#C20,V316^G(0,19)/#C20,V316
^H(0,19)/#C20,V316^I(0,19)/#C20,V316^J(0,19)/#C20,V316^K(0,19)%"
PROCEDURE: "C20,V318(0,19)%"DOCUMENTATION: "C20,V319(0,19)
#"DISBURSEMENT POLICY: "C20,V322(0,19)%"PROJECT MONITORING: "C20
,V323(0,19) FI,IF V2:'INST' THEN "NAME: "V10/C7,V90^A# C7,V90^B
#C7,V90^C#C7,V90^E#C7,V90^F#"PHYSICAL ADDRESS: "V85#"NATURE OF
BUSINESS: "V265#"PROFESSIONAL STAFF STRENGTH: "D270/(C10,V270^A,
C40,V270^B/#)%"PREVIOUS WORK EXPERIENCE: "V125#"SERVICE FEE:
"C20,V275(0,19)%"INTERNATIONAL EXPERIENCE: "V135#"LANGUAGE
COMPETENCE: "C25,V525#"REFEREES: "D145/(C20,V145^A,C20,V145^B(0,19)

```

PROFILE OF EXPERTS

MFN: 083

NAME: Sam Kibuuka-Musoke

NATIONALITY: Ugandan DATE OF BIRTH: 17/6/40 SEX: Male

POST OFFICE ADDRESS:

Box 7062, Kampala

PHONE: 11-24-63

TELEX: 35467

FAX: 251-335544

CURRENT POST: Cosultant Chemical Engineer

EMPLOYER: Uganda Government

UNIVERSITY EDUCATION:

1963 Makerere University B.Sc Eng.

1965 Nairobi Univesity M.Sc Eng.

1970 Cambridge University Phd

WORK EXPERIENCE

1970-73 Ministry of Works, Uganda Government
Chemical Engineer
Project Supervision and Control of Housing Estate
Construction, and Sewers Underpases

1977-80 Ministry of Industry and Technology, Uganda Government
Senior Chemical Engineer
Detailing and Concrete Mix Design on
Sub-Structure/Superstructure for Power Station
Construction at Jinja.

PREVIOUS CONSULTANCY AT HOME:

1990-93 Makerere University
Chairman of Projects Advisory Committee for all Capital
Projects

INTERNATIONAL EXPERIENCE:

1988 University of Science and Technology, Kumasi, Ghana
Maintanace and Management of Large Housing Estates -
Kumasi, Ghana.

REFEREES:

Dr. William Lukyamuzi
Dean, Faculty of Engineering
Makerere University

Mr. Godfrey Muhindo
Under-Secretary
Ministry of Trade and Industry

MFN: 084

NAME: Musoke David

NATIONALITY: Ugandan

DATE OF BIRTH: 06/13/1945

SEX: Male

POST OFFICE ADDRESS:

Box 4655, Kampala

PHONE: 23-11-64

TELEX: 23455

CURRENT POST: Dean, Faculty of Science

EMPLOYER: University of Science and Technology, Kumasi,
Ghana

UNIVERSITY EDUCATION:

1972-75 Makerere University B.Sc.

1975-78 Addis Ababa University M.Sc.

1980-84 Addis Ababa University Ph.D

WORK EXPERIENCE

1978-80 Makerere University
Lecturer
Teaching and Research

1984-89 Nairobi University
Associate Professor
Teaching and Research

1989-93 Addis Ababa University
Head of Department of Physics
Administration, Teaching and Research

REFEREES:

Mr Bernard Onyango
Academic Registrar, Makerere University
Box 7062, Kampala

Mr A.B. Abaliwano
Director, Management Training and Advisory Centre
Box 4655, Kampala

Mr A.D.N. Kagoda
Commissioner for Technology, Ministry of Trade and Industry
Box 102, Kampala

MFN: 085
NAME: Waloggo Abraham

NATIONALITY: Ugandan DATE OF BIRTH: 17/6/40 SEX: Male

POST OFFICE ADDRESS:
Box 7062, Kampala
PHONE: 11-24-63
TELEX: 35467
FAX: 251-335544

CURRENT POST: Cosultant Chemical Engineer

EMPLOYER: Uganda Government

UNIVERSITY EDUCATION:
1968-72 Addis Ababa University B.Sc Eng.
1972-75 Addis Ababa University M.Sc. Eng
1981-85 Oxford University Ph.D.

WORK EXPERIENCE

1970-73 C.Bryant & Sons Constructions Ltd, Kampala
Chemical Engineer
Project Supervision and Control of Housing Estate
Construction, Sewers Underpasses and, Foundations to
No-Fine Concrete Houses

1977-80 Higgs & Hill, Civil Engineering & Building Contractors,
Kampala, Uganda Ltd.
Senior Chemical Engineer
Detailing and Concrete Mix Design on
Sub-structure/superstructure for Power Station
Construction at Jinja

PREVIOUS CONSULTANCY AT HOME:

1986-88 Makerere University
Chairman of Projects Advisory Committee for all Capital
Projects

1988-90 Nairobi University
Member of Science panel for National Advisory Committee on
curriculum

INTERNATIONAL EXPERIENCE:

1988 University of Science and Technology, Kumasi, Ghana
Maintanace and Management of Large Housing Estates -
Kuamsi, Ghana.

REFEREES:

Dr. William Lukyamuzi
Dean, Faculty of Engineering
Makerere University

SAMPLE RECORDS FROM MACHINERY DATABASE

MFN 080

NAME

General Purpose Band Saws

MACHINE CODE:

Series 612

CAPACITY:

6" x 12" BLADE:

6" x 6"

BLADE SPEED:

50,100, 175,300

MOTOR:

0.5 H.P.

DOMESTIC SHIPPING WEIGHT:

460 lbs

NOTABLE FEATURES:

Ideal for maintenance shop, small
production shop, or occassional cut-off

Offers the utmost in low cost operating
economy, long life, accuracy and
versatility

Machine vise can be swiveled to any angle up
to 45 degrees for miter cutting

Local Users:

Bukoora Blachsmith
P.O.Box 507, Kabale
Phone 34211

Local Agents:

Active Motors
P.O.Box 15332, Kampala,
Phone 321900

COMMENTRY:

Fast, accurate, easy to operate and ruggedly
built with big saw features and a low price.
Variable feed pressure system, 4 blade speeds
with fast easy blade installation. Heavy rigid
cast frame strength and sustained accuracy
whether you are cutting tubing or solid bars.
Thirteen unique features make the series 612
your best buy

KEY WORDS:

Metal sawing machines; Marvel machinery; Metal
Cutting; Metal Cutting Saws; Metals; Machineries

MFN 081

NAME All Mechanical Universal Band Saws -
Medium Duty

MACHINE CODE: Series 8 Medium Duty

CAPACITY: Nominal, 18" x 18" BLADE:
18" x 12.5"

WORKING SURFACE TABLE: 33" x 24.25"

BLADE SPEED: Standard, 80 115 200; Optional: 2 speed
motor , 6 Blades Speeds;

Optional: Lima

FEED: Gear Drive , 12 Blade Speeds
0 to 80 lbs

DOMESTIC SHIPPING WEIGHT: Approx. 2425lbs

HEIGHT (FLOOR TO TABLE): 32.5"

NOTABLE FEATURES: Large T-Slotted Work Table, removable vises
for specialised work holding

Unequaled versatility, straight and miter
cuts up to 45 degrees right and left of
vertical plus coping and notching
capabilities, work always remains
stationary on saw table

Overhead Loading

Automatic Overload Relief Power Feed

Control Tower Visibility

Convenient Table Height Work Area

Automatic Stops to limit both forward and
return travel of the column and blade

Automatic Blade Tensioning

Built-in Protractor for setting column at
desired angle.

Cont'd next page

Local Users:

Afro Engineering Ltd
P.O.Box 3830 Kampala
254887/8/9

(AGECO) Ltd

M/S Afro General Engineers & Contractors
P.O. Box 181, Iganga
0495-2151

Local Agents:

Magric (U) Ltd
P.O. Box 34165, Kampala
Phone 256-663

COMMENTRY:

The Series 8 Band Saw Machine was designed for universal usage and will efficiently handle almost any conceivable sawing job, from the smallest, most delicate work to heavy solids and even die blocks. It will cut bar stock, pipe, tubing, moulding and structural shapes - saving hours of machining time. It is rugged, simple, un-fussy, easy to operate machine that requires little or no maintenance year after year. The vertical column which carries the blade is fed forward into and through the material which is always held stationary in the machine vises.

KEY WORDS:

Marvel machinery; Metal cutting saws; Saws; Machineries; Metals; Metal Cutting

SAMPLE RECORD FROM FINANCIAL INSTITUTIONS DATABASE

077

CORPORATE NAME Uganda Development Bank

OPERATIONAL AREAS: Agriculture: Crops, Livestock, Poultry, Fishing;
Commerce: Internal Trade, Export Trade,
Transport; Industry; Tourism, Construction

LENDING POLICY: Project Selection: The bank must be satisfied
with the following aspects of the project:

Technical, Managerial, Commercial, Financial and
Socio-Economic.

Project Appraisal: Employment potential;
Earnings and savings of foreign exchange; Income
distribution and, Technology Transfer.

Interest Rate: This include the following;
Commission 1 per cent; Appraisal charges and
commitment fees (1 per cent) on undisbursed loan
balances.

Guarantee: Guarantee fee is charged for grant of
a guarantee. The fee is based on the nature of
project, status of borrower, nature and extent
of commitment, amount and duration of guarantee.

Loan Period: Maximum termof a loan or guarantee
is 16 years including grace period of 2 to 3
years from the date of first disbursement to the
date of last repayment. The minimum period is 12
months.

Repayment: Repayment and grace period are fixed,
taking into consideration expected economic
life of assets.

Equity: Minimun lending level are the equivalent
of US\$100,000 for industry and tourism, and
US\$50,000 for agriculture.

Foreign Loans: Foreign currency loans are
denominated in the currency of disbursement and
all exchange risk is borne by the borrower.

Contributio form the borrower: 20 per cent of
the total project cost.

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Other factors: All legal, appraisal and supervisory charges are borne by the borrower.

On all loans a commission is charged at the time of signing of loan agreement.

TYPES OF FINANCING:

Direct loans; Co-financing; Equity participation; Guarantees; Special fund loans; Trust fund loan; Leasing

PROCEDURE:

Filling UDB Form 1 with feasibility study and with a complete a supplementary letter of information., After appraisal, the report report is presented to the Management Investment Committee for scrutiny and then recommended to the Board for approval

DOCUMENTATION

The Bank seeks adequate security such as mortgage, debentures, promissory notes and guarantees. Documentation includes certified copy of memorandum, articles of association, returns of directors, licence copy, land site copy, directors' property details, three years audited accounts, joint venture agreement if any, an investment licence, approved enterprises certificate for foreigner applicant; certificate of maximum liability in case of cooperatives.

DISBURSEMENT POLICY:

Progressive with the requirement of funds. They are normally disbursed directly to the suppliers of goods and/or services

PROJECT MONITORING:

Within the terms of the loan and may include submission of annual accounts, periodical reports of the project, periodical inspection, bank representation on the Board of the company, bank participation in the equity capital, usage of prior disbursement, etc.