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## List of Abbreviations and Acronyms

AACRAO:	American Association of Collegiate Registrars and Admission Officers
AAUP:	American Association of University Professors
ACACIA:	Communities and Information Society in Africa
ADEA:	Association for the Development of Education in Africa
AISI:	African Information Society Initiative
A-LEVEL:	Advanced Level of Secondary Education
ARIS:	Academic Records Information System
BTVET:	Business, Technical, Vocational Education Training
CAO:	Chief Administrative Officer
CBO:	Community Based Organisation
CUUL:	Consortium of Uganda University Libraries
DEO:	District Education Officer
DICT(s):	Directorate of Information and Communication Technology (ies)
EAC:	East African Community
ECA:	Economic Commission for Africa
EMIS:	Educational Management Information System
ESA:	Educational Standards Agency
ESIP:	Education Strategic Investment Plan
ESIS:	Enhanced Student Information System
ESIS-NSN:	ESIS National Student Number
FAFSA:	Federal Student Aid
FERPA:	Family Education Rights and Privacy Act
GDP:	Gross Domestic Product
GOU:	Government of Uganda
HEMIS:	Higher Education Management Information System
IAIMS:	Integrated Academic Information Management System
IBM:	International Business Machines
ICT(s):	Information and Communication Technology (ies)
ID:	Identity
IDA:	International Development Agency
IDRC:	International Development Research Council
IICD:	International Institute for Communication and Development
ILO:	International Labour Organisation
IMS:	Information Management System
IRM:	Integrated Resource Management
ITEK:	Institute of Teacher Education, Kyambogo
IUC:	Inter-University Council of East Africa
IUIU:	Islamic University in Uganda
JAB:	Joint Admissions Board
LC:	Local Council
MCT:	Multipurpose Community Tele-centre
MFPED:	Ministry of Finance, Planning and Economic Development
MIS:	Management Information System
MoES:	Ministry of Education and Sports
MTAC:	Management Training and Advisory Centre
MTN:	Mobile Telephone Network
MUBS:	Makerere University Business School
MUK:	Makerere University, Kampala



MUST:	Mbarara University of Science and Technology
NBEEC:	National Business Education Examination Council
NCBS:	National College of Business Studies
NCDC:	National Curriculum Development Centre
NCHE:	National Council for Higher Education
NEPAD:	New Partnership for Africa's Development
NGO(s):	Non Governmental Organisation(s)
NICI:	National Information and Communication Infrastructure
NIS:	National Information System
NQF:	National Qualifications Framework
NRM:	National Resistance Movement
NSIS:	National Student Identification System
NSLDS:	National Student Loan Data System
NSSF:	National Social Security Fund
NTC:	National Teachers College
ODA:	Overseas Development Agency
O-LEVEL:	Ordinary Level of Secondary Education
P1:	Primary One (the first year of primary school)
P7:	Primary Seven (the last year of primary school)
PEAP:	Poverty Eradication Action Plan
PEIMS:	Public Education Information Management System
PIN:	Personal Identification Number
PLC:	Primary Leaving Certificate
PLE:	Primary Leaving Examination
PS:	Permanent Secretary
PTA:	Parent-Teachers Association
PTC(s):	Primary Teachers College(s)
PVRIS:	Photographic Voters' Register and Identification System
RSA:	Republic of South Africa
S&T:	Science and Technology
S1:	Senior One (the first year of secondary school)
S5:	Senior Five (the first year of A-level secondary education (higher School))
SA:	South Africa
SAPSE:	South African Post-Secondary Education
SAQA:	South African Qualifications Authority
SOEIS:	Self-Organisation of European Information Society
SPEEDE:	Standardisation of Post Secondary Education Data Exchange
SSADM:	Structured Systems Analysis and Design Method
SSN:	Social Security Number
STS:	Student Tracking System
TEA:	Texas Education Agency
TIN:	Tax Identification Number
UACE:	Uganda Advanced Certificate of Education
UBEE:	Uganda Business Education Examination
UBOS:	Uganda Bureau of Statistics
UCC:	Uganda College of Commerce
UCE:	Uganda Certificate of Education
UDHR:	Universal Declaration of Human Rights
UJTE:	Uganda Junior Technical Examination

UK:	United Kingdom
UNBS:	Uganda National Bureau of Standards
UNCST:	Uganda National Council for Science and Technology
UNDP:	United Nations Development Programme
UNEB:	Uganda National Examinations Board
UNECA	United Nations Economic Commission for Africa
UNESCO:	United National Educational Scientific and Cultural Organisation
UNISE:	Uganda National Institute for Special Education
UNSA:	Uganda National Students Association
UPC:	Uganda Peoples' Congress
UPE:	Universal Primary Education
UPK:	Uganda Polytechnic Kyambogo
UPL:	Uganda Post Limited
UPPC:	Uganda Printing and Publishing Corporation
UTA:	Uganda Teachers Association
USA:	United States of America
UTC:	Uganda Technical College
UTEE:	Uganda Technical Education Examination
UTL:	Uganda Telecom Limited
VC:	Vice Chancellor
WSIS:	World Summit for Information Society



## CHAPTER ONE

### INTRODUCTION TO THE STUDY

#### 1.1 Background to the Study

Since independence, on 9<sup>th</sup> October 1962, Uganda has been troubled by political instabilities leading to economic breakdown (Mudoola 1991:230). Wars, civil strife and political conflicts have disrupted a nation whose economy was one of the most vibrant and promising in Sub-Sahara Africa. The political crisis of 1966 during which the independence constitution was abrogated marked the beginning of political confusion and economic collapse. The political rumbling and factionalism emanating from the 1966 crisis ended in a military coup led by General Idi Amin in 1971 as the new president (Kaberuka 1990:249). He [unless otherwise stated, the masculine form of ‘he’ right through this thesis means both sexes] declared an economic war aimed at the Asian community, claiming that Asians had failed to integrate into Ugandan society. The Asians, who were the major proprietors and entrepreneurs then, were expelled from the country. Their businesses were handed over to people who had no skill and sense of business management. Consequently the industrial sector disintegrated, marking the structural collapse of the economy. As a result government revenue shrank and all public services such as education, employment and infrastructure suffered. The administrative system in government ran on the basis of fear and favouritism (Uganda 1982:4). As a result, there was a market shift from the formal, controlled sector to the informal, uncontrolled sector (Kaberuka 1990:256) that operated on the basis of smuggling called *magendo*—a system that operated by avoiding government controls and taxation. This has not only affected the business sector, but also the social and education sector in particular.

The 1978/79 war (Kaberuka 1990:277) that removed Idi Amin from power caused further damage to the already fragile and disintegrating Ugandan economy. School supplies, office records and tools were destroyed (Uganda 1982:8). The new regime, headed by Professor Yusufu Lule, leading the Uganda National Liberation Front (UNLF) [A full list of abbreviations and acronyms is supplied in the preliminary pages that precede this Chapter] government, did not last long enough to have any impact. Within 68 days of ascending to power, Lule was overthrown, leading to more chaos in the country. The Military Council also overthrew the government of Godfrey Binaisa who had replaced

Lule. Uganda's social infrastructure deteriorated further as a consequence of years of neglect, lack of maintenance and the legacy of wars of liberation (Tumusiime 1992:64).

The Military Council later organised an election, which it rigged in favour of Dr Apollo Milton Obote and his Uganda People's Congress (UPC) (Wiebe & Dodge 1987:1). This triggered a civil war, which further complicated and dimmed any hopes for economic development. As the economy disintegrated further, social services also broke down. Schools were operating without basic minimum requirements, as inflation had galloped to 35% (Katorobo 1997:345). The civil service hardly functioned, crime was endemic, the infrastructure had collapsed, and schools and hospitals possessed no materials (Brett 1997:33-34). In July 1985, the Commander General of the army Tito Okello Lutwa, together with Brigadier Basilio Okello, overthrew the government of President Obote. This regime lasted a little over six months, ending with the National Resistance Movement (NRM) taking over Uganda's Government on 26<sup>th</sup> January 1986 (Wiebe & Dodge 1987:1).

When the NRM gained power under the leadership of President Yoweri Museveni (Lateef 1991:20-41), Uganda's socio-economic and political systems were in a shambles (Katorobo 1997:345). The NRM was faced with the task of the rehabilitation and development of the shattered economy and raising the standard of living of the population (Tumusiime-Mutebire 1997:1). Its main focus was the rehabilitation of the country's productive and social infrastructure (Lateef 1991:20-42). The NRM government set modernisation of the economy as one of its main priorities in national development (National Resistance Movement 1986:16-25). The Ten-Point Programme of the NRM (1986:7) provided a leadership framework for the government of Uganda that focuses on national integration, a strategy that aimed at ensuring collaboration and equal participation of the society in achieving nationally set goals.

The Government of Uganda views an integrated modern economy as the way forward. The pillar of the modernisation programme is education, and the development of an information and communication infrastructure, amongst other aims. By means of information, communication and education, the government hopes to create a society that is inclined to modernisation, which will integrate the socio-economic and political needs of the society.

In modernising the economy, the Government of Uganda has accorded information priority. This is evident from several pieces of legislation and other policies, as will further be discussed in Section

3.5. For instance, the 1995 Constitution provides for the right of access to information in possession of the state or any other organ or agency of the state. Article 41(I) thereof states:

*Every citizen has a right to access information in the possession of the state or any other organ or agency of the state except where the release of the information is likely to prejudice the security of the state or interfere with the right to the privacy of any other person* (Uganda 1995<sub>a</sub>: Article 41(I)).

This idea is also reflected in the main strategies of *Vision 2025*, which provides for developing a national policy on information management (Uganda. Ministry of Finance, Planning and Economic Planning 1999<sub>a</sub>:86). The vision sets out the course and benchmarks for socio-economic development that the country should consider in order to get out of its current socio-economic deprivation (Uganda. Ministry of Finance, Planning and Economic Planning 1999<sub>a</sub>:75). *Vision 2025* identifies education as a prominent feature in national development. The government has acted by introducing Universal Primary Education (UPE), which in turn has increased the demand for secondary and higher education in Uganda. Since higher education in Uganda exerts a major influence on the development of the education system in general, effective management of information on students at this level is likely to facilitate coordination and effective utilisation of this information in the country.

Uganda's education structure is based on a four-tier model. The structure provides for seven years of primary school on the first tier. The second level consists of four years of formal education in secondary school, known as Ordinary level (O-Level), or at technical schools for three years. The O-Level qualifies a candidate to join the third level for two years of Higher School (HSc) referred to as Advanced Level (A-Level), technical institutes for vocational, business and technical education, or colleges for primary teacher training. The A-level qualification or its equivalent is a mandatory requirement for entry to a fourth level—tertiary/higher education [The term tertiary education will be interchangeably used to refer to higher education depending on the context in which it is used]. At the tertiary level, a certificate is studied for a minimum of one year, a diploma for a minimum of two years, and degree courses last for a minimum of three years. In Chapter four, the structure of the education system in Uganda is described in more detail. The relationship between different levels of education in Uganda is presented in Appendix 1.1 and explained in detail in Section 4.3.

Presently there are 14 420 primary schools with 7.4 million pupils (*Uganda Bureau of Statistics* 2003:8). There are also 2 198 secondary schools with 658 000 pupils. According to government

development plans, every sub-county (the local government structure is based on five local council (LC) levels—at village (LCI), parish (LCII), sub-county (LCIII), county (LCIV), and district (LCV)) should have a government secondary school. Every child in Uganda is entitled to free education under the Universal Primary Education (UPE) programme. In addition, the government of Uganda pledges to establish community polytechnics in each of the 850 sub-counties in the country (Uganda Ministry of Education and Sports 2002a:46). This shows government's commitment towards education development. However, it also heralds management challenges. As education opportunities open up at the lower levels there is increasing pressure on higher education to expand every year to accommodate these increasing numbers.

Higher education in Uganda is expanding rapidly (Appendix 1.2 contains a list of some of the institutions of higher learning in Uganda). In the last 18 years, 1987-2005, several institutions have been established. From one university in 1986, 19 universities exist today in the country (National Council for Higher Education 2005). *The Education Sector Fact-file* 2001 shows that there are about 25 649 students enrolled in universities, while over 37 685 have joined other tertiary institutions (Ministry of Education and Sports. Education Planning Department 2001:2). The other tertiary institutions [The term 'other tertiary institutions' will be interchangeably used to refer to 'other institutions of higher learning' depending on the context in which it is used] include six National Teachers Colleges (NTCs), five Uganda Technical Colleges (UTC) and five Uganda Colleges of Commerce (UCC), seven agricultural sector-based tertiary institutions, 27 paramedical schools, 2 weather and land science institutes, and 2 leisure institutes. Most of these institutions offer a further and/or vocational training at certificate or diploma levels.

In addition, there also exist 70 business technical vocational education training (BTVET) institutions and 47 primary teachers colleges (PTC). All these institutions enrol students who have gained O-Level or A-Level qualifications. The graduates of these institutions can enrol for higher education. These institutions enrol A-level graduates or holders of a 2-year certificate in a relevant field. Section 4.3 describes the structure of the education system, Table 4.1 in section 4.3 describes the types of educational institutions, while Section 4.6 explains the state of higher education in Uganda.

This study investigates student information management for higher education in Uganda. Each of the institutions of higher learning keeps information about every registered student. Most of them, however, have varying methods and forms of capturing, storing and retrieving this information. It is possible that the lack of uniformity in managing this information in these institutions slows down its

collection, storage, retrieval and processing. This has affected the development and use of such information in Uganda. This discussion will now explore the state of the student information management system (SIMS) and its integration in the government strategies in Uganda.

### **1.1.1 The status of a student information management system in Uganda**

Institutions of higher learning in Uganda maintain their own students records, besides the records kept by the Uganda National Examination Board (UNEB) and the Ministry of Education and Sports (MoES). The MoES is responsible for the central collection, processing, and utilisation of data and information; and coordinating it for effective decision-making on the national level. It is also responsible for formulating education policies in the country as well as rendering educational services through its various bodies and departments. The role of MoES in the educational sector that will be discussed in Section 4.5 includes policy formulation, inspection and standards, educational planning and management, management of educational information, and students' guidance and counselling.

Through the Joint Admissions Board (JAB), MoES is responsible for admitting students to the institutions of higher learning. The government has enhanced this function and established a National Council for Higher Education (NCHE). The Universities and Other Tertiary Institutions Act, Article 6(7), 2003 provides for the functions of NCHE, among others, as being:

*To promote and develop the processing and dissemination of information on higher education for the benefit of the people; to set and coordinate national standards for admission of students to different institutions of Higher Education; to collect, examine and publish information relating to the different institutions of higher learning; advise the government on policy and other matters relating to institutions of higher education (Uganda 2003<sub>c</sub>: Article 6).*

This Act is still in the early stages of implementation. Although the NCHE is responsible for collecting, examining and publishing information relating to different institutions of higher learning, the Act does not show how student information can be coordinated in Uganda. The existence of NCHE, however, will provide a base for an institutional framework for an integrated SIMS for the education sector in Uganda. This framework will coordinate and facilitate the integration of a SIMS for higher education in Uganda, as explained in Section 2.7.4.

The MoES keeps information about students in Uganda. It also holds data formally submitted by the



Uganda National Examination Board (UNEB) regarding students registered at O-Level and A-level. The institutions of higher learning rely on the records kept by the MoES, UNEB, and NCHE. UNEB is empowered by the National Examinations Board Act, 1983, Article 3 to conduct primary, secondary, technical, and such other examinations within Uganda, as it may consider desirable in the public interest, to award acceptable certificates or diplomas to successful candidates, and to make rules and regulations for the conduct of examinations (Uganda 1983<sub>a</sub>: Article 3).

In the conduct of its duties, UNEB has faced a number of problems in the administration of examinations and the releasing of results. For example, candidates sitting examinations they never registered for and sitting examinations in different centres cause major problems. Problems also occur due to poor filling in entry forms and wrong information submitted to UNEB, e.g. wrong index numbers or provision of a different name from that on the form (Odongo 2001:1). These are a result from a lack of standard guidelines on formats of data entry, identification of student information and a lack of coordination between the educational institutions, UNEB and MoES.

Procedures by UNEB for registration and examination have facilitated coordination of student information in Uganda. Before students sit for O-Level and A-Level examinations, they fill in forms indicating their choices of institutions of higher learning. These forms are submitted to the MoES to assist in the students' selection for either universities or other tertiary institutions through the Joint Admissions Board (JAB). The JAB constitutes principals and registrars representing institutions of higher learning in Uganda, which rely on volumes of printed examination results provided by UNEB to admit students to their institutions.

Institutions of higher learning require a system that will enable them to extract the appropriate information from the available data that they receive from the students' former schools/institutions during admission. The absence of such a system in the country has not only led to loss of student information but has also limited the sharing of this information in the country.

Upon admission, another set of records is created for each of the successful entrants in the respective institutions. This requires care in verifying the information received when enrolling students in higher institutions of learning. Verified information is eventually stored and managed by the respective institutions. Normally several queries are made during verification to seek information about each student. This has resulted in the expansion of information requirements for higher education. Managing such large volumes of information is prone to failures that could lead to

mistakes in decision-making. This is articulated in *Makererian* (2000:4), a Makerere University campus newspaper, which reported that over 600 students were admitted in 1999/2000 after filing complaints regarding not being admitted although they had the necessary minimum cut off points. Nangozi (2000:2) has observed that the omission of such students from the admission lists is often a result of inaccurate information provided during the application. In fact, cases of changes in names, results and biographical information, for example, are discovered long after admission or even after graduation, because of inadequate means to verify student information. Sometimes it is not easy to match past records with new ones generated during admission. Although student information exists in the respective institutions, there is no system that can enable tracking of such information. Sharing of this information is further inhibited by lack of a standard method to identify student information kept in the country. For example, whenever a student, who was enrolled at one institution, enrolls at another institution, a new identification (index/ registration) number is issued. The result is that student information becomes uncoordinated and scattered in these various institutions/schools. There is no common data attribute of 'student information' that can be used to trace student information (an entity) throughout the various institutions attended. This has resulted in some students registering in more than one institution at the same time, people forging academic results to take on political and administrative posts, and a few students gaining admission to institutions of higher learning on the basis of forged results. These lapses present opportunities for fraudulent entry to university, and could also lead to qualified students failing to gain admission to university or any other tertiary institution.

For example, Makerere University recently had to disown and cancel the degrees of a number of politicians seeking political positions, which required the holders to possess university degrees. Their nominations for the political posts had to be nullified because they carried forged degree certificates. It was also discovered that some had entered University using the O-level and A-level results of other people, while others had altered their O-level and/or A-level results. All these cases of fraud and impersonation result from a poor or non-existent student identification system in the country.

While clarifying the nominations nullified by the Electoral Commission, Prof. Opio Epelu, the Deputy Vice-Chancellor of Makerere University, as reported by Osike (2001:1), said:

*Cases of impersonation, falsification of documents or giving false or incomplete information whenever discovered either at registration or afterwards lead to automatic*

*cancellation of admission and results (Osike 2001:1).*

As reported by the *Monitor* (Katamba 2001:1) and the *New Vision* (Namutebi 2001:5), candidates exchange various academic certificates to gain places in universities or any other tertiary institutions and to obtain employment. According to the papers, Mr. Sebastian M. Ngobi, the Academic Registrar of Makerere University is referred to have stated that impersonation is common and that different people use the same results and names to join institutions of higher learning. He further gave a case in point:

*We have just found that the 'O' level results slip Index No. U0153/187, UCE (Uganda Certificate of Education) 1980 was presented by two applicants to support their applications for admission into the University (Namutebi 2001:5).*

This shows that uncoordinated records may result in forgery. When retrieving information about students, it usually takes a long time to obtain the reports required for effective decision-making by the relevant institutions.

Presently, there is no student information system in place at any single institution of higher learning that can be relied on by others to extract accurate and reliable student information. The Government of Uganda's *White Paper on Education* observes that due to the poor quality of statistics at institutions of higher learning 'there is no reliable information available on items such as the number of students and teachers in the education institutions in Uganda' (Uganda. Ministry of Education and Sports 1992:190). An efficient student information management system is therefore imperative.

Such a system is urgently required to track an individual student's progress and performance at every level of education. Such a system makes it quicker and easier for managers to identify, access and retrieve this information. For such a system to run efficiently, it must integrate organisational objectives into its strategic framework.

### 1.1.2 Strategies for coordination of SIMS in Uganda

Different institutions of higher learning have put in place strategies for the capture, storage and retrieval of student information. For instance, Makerere University in 2001 developed an information and communication technology policy and master plan. The policy identifies an Academic Records Information System (ARIS) as a priority area to support academic, administrative and managerial processes in the university.

*It is the University policy to enhance and streamline student education related to administrative and managerial processes and to improve academic facilities at both central and faculty level through the implementation of an Integrated Academic Records Information System (Makerere University. Directorate of Information and Communication Technology Support 2001:3).*

An Academic Records Information System (ARIS) is supposed to effect proper management of students' personal records, admission of students, management of academic performance, curriculum and course records. It is also intended to cater for class scheduling, space and academic staff requirements, students' financial transactions, and student health information. The initiative is still being introduced and tailored to meet the needs of Makerere University alone. It is not the intention to address it to the national needs to capture, store and coordinate student information throughout the country.

Furthermore, ARIS also cannot be used as a pilot case for the country because its relevance is limited to Makerere University's own information requirements. Besides, Makerere University has a strong financial base with sufficient support from donors to initiate and develop ARIS. No studies have been done to find out how information systems in educational institutions can be integrated within the education sector development strategies. However, some of ARIS' features such as management of student personal records, academic performance and admission records, can be adopted by other institutions of higher learning in designing their own systems, keeping in mind their respective information needs. Even if other institutions of higher learning could develop their own information systems, they would remain separate in the absence of a national student information system.

It is evident that coordination and planning is impossible in the absence of reliable information on students (Uganda. Ministry of Education and Sports 1992:190), hence government's concern. *The*

*Government White Paper on Education Policy Review* proposes that basic data on education should be centrally collected, compiled, and published annually (Uganda. Ministry of Education and Sports 1992:190). It also emphasises the need to share this information as a national resource for easy coordination and implementation of government strategies. The White Paper is a document that provides policy proposals and describes how they should be implemented and evaluated. In Uganda, the provisions of the Government White Paper on education are guiding reforms in the Education sector. All development plans and innovations in this sector must be consistent with the provisions of the White Paper, which identifies information management as an appropriate foundation for the development of the sector.

In an attempt to promote the coordination and sharing of information in Uganda, the Ministry of Education and Sports (1998) has put in place the Education Strategic Investment Plan (ESIP). This provides for the establishment of an Education Management Information System (EMIS) whose purpose is to produce quality, timely and cost effective statistics from educational institutions. The statistical returns should provide all information reflecting the conditions in the institutions that are published for the *Annual Educational Statistical Abstract* (Ministry of Education and Sports. Education Planning Department 2001:1). [References based on government ministries or departments which are not available for public consumption or those that are in draft form or have been obtained from the files or offices of ministry or departments have been cited under the ministries and/or department rather than the names of the country.]

However, EMIS is not specifically designed for managing information about a student. It focuses on general statistical issues in the education sector, with less regard to student information for higher education. Nevertheless it offers the necessary background and experience that can be used as a basis for the capture, coordination, sharing and use of student information in Uganda. This, however, requires standards that can facilitate harmonisation in the management of student information. The Education Standards Agency (ESA) (Uganda. Ministry of Education and Sports 2001<sub>b</sub>:1) is mandated to monitor, assess the progress of and provide standards in education (Uganda. Ministry of Education and Sports 2001<sub>b</sub>:1). Although this does not contribute directly to student information management, it is nevertheless an indicator of this information. Besides, there is a strong case that ESA could benchmark the format and standard for a student information system in the country. However, this requires a framework for the integration of the indicators into the education sector development strategies.

In its education strategic investment plan (ESIP), the Ministry of Education and Sports aims at strengthening the management of higher education by developing a strategic framework, targets and plans for higher education institutional reform (Uganda. Ministry of Education and Sports 1998<sub>a</sub>:18). However, it has no strategic objectives for a student information system, as an integrated strategy. Such a system would have been expected to be at the heart of ESIP. Without it, the whole concept and mission of strategic management in the education sector and the attendant reforms are in the balance.

It is apparent that Government has not taken any serious steps to establish an integrated student information management system for higher education. At the moment there is no mention of such system in any policy relating to education. Besides, no recommendation relating to the capture and coordination of information was made. There is a need, therefore, to address the issue of coordinating student information among all institutions of higher education in Uganda. Hence the necessity for the present study.

## **1.2 Statement of the Problem**

Educational institutions in Uganda manage student information independently and in their own ways. There are no common, standardised procedures and programmes for capturing, processing and storing this information. This has kept student information disintegrated in different institutions. Often there are discrepancies in information provided by students to the institutions in the country.

The majority of institutions do not know what student information is needed to be captured and kept for an effective information system. No standard requirement is in place regarding what information would identify a student. At different levels of the academic ladder, a student's identity seems to change. In Uganda the common identity a student carries is the index/registration number. The number, however, changes when a student moves from one level to another or to a different institution. For instance a student leaving A-level abandons his index number after joining university because a new one is provided. With such changes, it is difficult to keep track of a student's history. It also makes it easy for one to change his personal attributes undetected, for instance, to alter the name of a student. This makes Uganda's education system susceptible to fraud.

Since Uganda is now rising out of its political and economic chaos and is set on a development path, proper information systems are a prerequisite. Uganda is drawing inspiration from her Vision 2025,

to undertake her modernisation and development plan, but this lacks an enabling strategy for management of student information.

The problem to be investigated in this study is therefore to develop a strategy for how an identification system to coordinate SIMS can be integrated into higher education development programmes in Uganda. The study therefore examines the current state of the management and coordination of information regarding students of higher education in Uganda. It also assesses the needs and requirements for an integrated student information management system.

### **1.3 Aim of the Study**

The study aims at designing a strategy for the coordination of a student information management system for Uganda. To achieve this aim, the following three research questions are examined in the study:

#### **1. What is the current state of the management and coordination of student information in Uganda?**

- (a) What kind of student information is captured and kept by various institutions in Uganda?
- (b) What are the current procedures and activities in the management and coordination of student information in Uganda?
- (c) What is good about the current way student information is managed and coordinated in Uganda?
- (d) What are the challenges in the management and coordination of student information in Uganda?

#### **2. What are the needs and requirements for SIMS in Uganda?**

- (a) Why is it important to coordinate student information in Uganda?
- (b) What student information and activities can be standardised to facilitate coordination of student information in Uganda?
- (c) What are the benefits of a coordinated SIMS in Uganda?
- (d) What are the reservations regarding a coordinated SIMS in Uganda?
- (a) What factors may facilitate keeping track of student information in Uganda?

#### **3 What are the strategies for an integrated SIMS in Uganda?**

- a) How can a national student identification system (common method of identifying a student in the country) provide a coordinating strategy for an integrated SIMS in Uganda?

- b) What are the strategies for assuring the sustainability of an integrated SIMS for higher education in Uganda?

These questions are answered in chapters six and seven. Observations are discussed in chapter eight in relation to the background information available, and existing models and theories that led to the conclusions provided in Chapter nine. A framework for SIMS for higher education is also provided in Chapter nine. The chapter also proposes a strategy for how a student identification system to coordinate SIMS can be integrated into higher education development programmes in Uganda.

#### **1.4 Current State of Research on this Topic**

Currently there is no particular research into such a system. However, substantial research, to be discussed later in this section, has been done on automation and computer utilisation in the management of student information in higher education in Uganda.

For example, Zziwa (2001) carried out a study to investigate the extent to which computers are utilised in the management of student information and whether they are obstacles in any way in this process. In a descriptive survey, Zziwa observed that computers are not effectively utilised. This was attributed to lack of standard guidelines on how to utilise computers in the management of this information. The study concluded that standard guidelines on how to utilise computers and the type of student information to capture would facilitate the effective use of computers in the country. It is the aim of the present study to develop a framework that will provide such guidelines for a coordinated SIMS in Uganda.

In her research on utilisation of information in admission to Makerere University, Nakaye (1998) focused on the physical and human resources of the management information system (MIS) that govern the undergraduate admissions and record management in Makerere University. The study sought to examine the effects of existing IT and timely completion of admission and registration processes in the university. It examined the nature and amount of information collected from applicants, as well as its management and utilisation. Using interviews and a questionnaire, the study identified weaknesses in the computerisation processes of both selection and registration exercises at Makerere University. The study recommended that the MIS governing admissions needed to be revisited to improve its efficiency.

In his study, Magara (1999) referred to this recommendation to revisiting this MIS. His study on



‘Automation of students records system at Makerere University: An analytical approach’ aimed at developing a framework for effective and efficient management of students’ records in Makerere University. Using a qualitative research design, interviews and a questionnaire were administered to different categories of respondents. The study observed a need for automation of students’ records based on the existing student information management functions, including registration and examination management. The study set up a framework for the improvement of current students’ records and computerisation of the records system and provided strategies for its implementation. The standardisation of student records formats, and the establishment of a students’ information reference service in the university, were among the requirements. It was recommended that a logical and physical design be developed, dependent on the comprehensive analysis of such a system. Magara’s study concentrated on the management of students’ records in general, with less regard to a student’s record as an entity. However, the study provides a background for the nature of student information being kept in institutions of higher learning. Moreover most of the recommendations of Magara’s study have been addressed by the Academic Records Information System (ARIS), which was discussed in Section 1.1.2 of this chapter. This study on SIMS will therefore provide a conceptual design for a SIMS for higher education in Uganda.

Elsewhere in the world, there have been a number of studies on student information systems. Most of them describe programs and systems in the management of student information, as will be discussed in Chapters Two and Five. The available programs and systems that seem to offer coordination of student information tend to handle the information of a single University, although located in different areas of a country (Tulane University 2000; University of Hawaii 1999). Few of the systems like that of the Massachusetts Department of Education (2001) or the Texas Education Agency (2002) have incorporated a state-wide information management system. Few have addressed the coordination and standardisation of transactions in the management of student information (LYCOS SIRS 2000; Lonabocker 1997). Most of the systems only support routine transactions like admissions, enrolment, examination management and fees management (NCS Pearson 2001:1). The available national student information systems such as the Enhancement of Student Information System (ESIS) used by Statistics Canada (2003), and the Higher Education Information Management Systems (HEIMS) in South Africa (South Africa. Department of Education 1999:11), as discussed in Section 5.4, lack a strategy for identification of student information and for its integration into any country’s national development plans and programmes.

This specific study, seeks to address the system needs and requirements to provide a strategy for a

student information system for Uganda. The strategic framework approach in this thesis is based on the type of information and how it is to be managed. It analyses the socio-economic feasibility of the information system requirements and establishes stakeholders' expectations of a SIMS for higher education in Uganda.

## **1.5 Methodology and Research Design**

This section involved data gathering, which helped the researcher in answering the research questions in this study. It covers the area of research, study design, subjects of study, data collection methods and research procedure. This section also describes why a pilot study was carried out, and the data quality controls provided for the study. It also illustrates how data was analysed and presented.

### **1.5.1 Area of the Study**

The study was conducted in the Ministry of Education and Sports, semi-autonomous bodies in the education sector, educational institutions, and district education departments. The departments of higher education, counselling and guidance, secondary education, vocational training and that of educational planning in the MoES were selected for the study area, because of the role they play in the education sector. For example counselling and guidance handles students' selection and enrolments in secondary schools, while Business Technical Vocational Educational Training (BTVET) is responsible for the coordination of students' informal education with tertiary education. Educational planning deals with the collection and management of educational sector data and information. Education departments at district level also formed part of the study. Section 6.2.6 describes the institutions selected for the study.

## 1.5.2 Study Design

This study was conducted using a qualitative research framework, which permits the evaluator to study selected issues in depth and detail (Patton (1990:36). Patton (1990:36); Busha and Harter (1980:59); and Weingand (1993:20) describe this as a strategic research framework that defines what (if anything) should be done about an issue to be studied (the phenomenon). A Phenomenological research approach was therefore adopted, that identified a phenomenon: student information management system (SIMS). This approach was used because it studies experiences from the perspectives of the subject under study. This approach was thought to be powerful for understanding the subjective experiences, insights, and actions of respondents, things taken for granted, and conventional issues. It provided a coherent set of propositions and explained the phenomenon—in this case of SIMS.

## 1.5 Population and Selection of the Sample

Sampling involved selecting a sufficient number of elements for the subject of study. SIMS is described by ‘information’ kept about a student, ‘processes/activities’ done on student information, and ‘events’ that happen in the management of this information. In this study, various stakeholders in the education sector constitute the study respondents. They include people responsible for the capture, storage, management and use of students’ information such as policy makers, educational administrators, educators (lecturers and teachers), and students. Educational administrators include among others: registrars, deans of students, directors of studies, and heads of various units and departments.

The respondents also included key informants who were selected from MoES and sector semi-autonomous bodies, including the Education Standards agency (ESA), Uganda National Examination Board (UNEB), and National Council for Higher Education (NCHE), and National Curriculum Development Centre (NCDC). The offices of education in various districts also formed part of the study area. Sections 6.2.1 to 6.2.4 describe the characteristics of the institutions and respondents selected.

Clustering sampling to draw representation from each category of respondents was used (Busha & Harter 1980:60; Nkapa 1997:33). Education institutions were categorised into four clusters: Universities (public and private), Other Tertiary Institutions (e.g. National Teachers Colleges,

Uganda College of Commerce and Uganda Technical Colleges, UTC's), Training (Business, Technical and Vocational Education Training, and Primary Teachers Colleges), and Secondary Schools. Apart from the universities, all the categories were selected according to regions. However, the institutions were purposively selected, depending on their accessibility and the previous information the researcher possessed about the institution. Eventually, the respondents were selected according to the positions and responsibilities held in the institution, as explained in Section 6.2.2.

In the selection of the district education office, districts were clustered into regions (Eastern, Northern, Western and Central). In each region, at least one district was selected accordingly, and instruments administered to purposively selected respondents. Respondents selected from Education Standards Agency (ESA), Uganda National Examination Board (UNEB), and National Council for Higher Education (NCHE), National Curriculum Development Centre (NCDC), and MoES were chosen based on their positions and responsibility. Purposive sampling also applied to areas visited and objects observed, records/documents consulted, and events attended, as explained in Sections 6.2.5 and 6.4. Appendix 6.3a shows details of events attended. Student leaders were also selected purposively.

#### **1.5.4 Data collection methods and instruments**

The following research methods were used for the study:

##### **(I) Questionnaires**

A questionnaire was used to obtain basic data about SIMS from purposively selected respondents. Semi-structured questionnaires with limited closed questions were used. These consisted of opinion and attitude questions, self-perception, and projective questions. The closed questions provided an option for explanations or comments. Attention was devoted to the content of the question, wording, and format. The researcher made an effort to imagine himself as being in 'the respondent's shoes' when designing the questionnaires for this study (Bailey 1994: 4). One questionnaire was self-administered to administrators and another, different, questionnaire was administered to student leaders in educational institutions. The analysis of the respondents for the questionnaire is described in Section 6.2.1, and copies of the questionnaire for administrators and students are attached in appendices 1.4a, and 1.4c respectively.

For successful utilisation of questionnaires, the researcher ensured cordial relationships with the respondents. The questionnaires also took into account the size and length of time to be taken to fill them in. For each questionnaire, the date submitted, date to be collected, the actual date collected, and comments were recorded. A question to evaluate the effectiveness of the research was included at the end of the questionnaire. Assurance of confidentiality of the data was provided at the beginning of the questionnaire.

## **(ii) Interviews**

Interviews were used to obtain detailed information about a student information management system (SIMS). The interviews were not only used to answer the research questions under study, but also to obtain ideas of the person being interviewed regarding potential systems improvement (Penn, Pennix & Coulson 1996:61). In-depth interviews were conducted with key informants. The interviews attempted to obtain information from persons who were believed to be able to provide essential data for this research (Busha & Harter 1980:78). Information obtained from interviews mainly concerned the interviewees' experiences, their opinions and attitudes, their reactions to trends and developments; and their knowledge about SIMS in Uganda. An interview guide (as shown in appendix 1.4b) was used to guide the interview process.

Arrangements for interviews were always done with respect for the interviewees' convenience, by seeking an appointment in advance. Necessary facilities for interviews were adhered to, including training for research assistants, approaching and dealing with the respondents appropriately, choosing a suitable time and place with a conducive environment. Interviews were checked for completeness and possible errors (Sarantakos 1994:280).

Background information about the respondents was obtained before planning the course of the interview and discussion. Open-ended questions were carefully phrased so as to avoid misinterpretation. Attempts were made to let the interviewees know exactly what questions were to be asked, in what form the questions would be posed, and the method by which the data would be accurately recorded. This was done to enlist respondents' co-operation. Care was taken not to put the respondent under pressure. The respondents were helped to understand and appreciate what was being studied and its implications for the overall development of the education sector, and

eventually the country. Care was also taken to lead the interviewees to understand that this study was about SIMS not about the respondents. The significance of the interview was clearly explained to the respondents and gratitude expressed for their contributions. Tape recordings were used to capture information, to avoid inconveniencing the respondent. Permission to record any interview was sought first from the respondent.

### **(iii) Focus Group**

Focus groups provided detailed discussion for selecting new ideas and creative concepts (Stewart & Shamdasan, 1990:15; Slater, 1990:113). This method was used for the purposes of obtaining general information, stimulating new ideas, diagnosing the potential problems, and identifying the attitudes of the respondents. The participants in focus group discussions included teaching staff in educational institutions with administrative responsibilities, including heads of subjects, sections, and departments, from the three selected educational institutions one group each from the categories of universities, training institutions, and secondary schools; and purposively selected student leaders from a university. Each category of respondents was met separately. Section 6.2.1 gives more details. A focus group schedule (appendix 1.4d) was used to guide the discussion.

### **(iv) Literature Search and Content Analysis**

Content analysis involved examining information and/or content from primary, secondary and tertiary sources (Neuman 1997:31). A record schedule (appendix 1.4e) was used to record the contents of the records under study. The researcher had first to identify a body of materials (from office records, reports, and notice boards) and a system in recording the observations. It involved a systematic and qualitative description of the manifest content of the communication (Busha & Harter 1980:171). An analysis of information already obtained from documents and a review of records, and from people, was referred to. Secondary and tertiary data were obtained from the library, Internet and CD-ROM sources, archives and records centres, and from public offices. All literature sources consulted were acknowledged using the Harvard method referencing technique (Burger 1992:27). Ethical conduct was observed in the accessing and use of records obtained for content analysis. Materials selected were sampled and analysed and interpreted according to the objectives of the study. All literature used in this study was subjected to content analysis. Table 6.3a gives an analysis of the records sampled for the study.

## **(v) Observation**

This method involved noting significant issues and relating them to other issues already noted elsewhere, as per the research objectives (Sarantakos (1994:288). In this study, observation involved identifying the object of study, noting observation issues that occurred during data collection, recording the data, and respecting the rules of research. In depth observation of record centres, personal files, and notice boards was made. The researcher also participated in some of the events in educational institutions, including selection, student orientation, and executive meetings. An observation schedule (appendix 1.4f) identifying themes and issues to be observed was used. A camera was used to take photographs of the object of study in a bid to support the data collected with concrete evidence.

### **1.5.5 Research Procedure**

A literature search was conducted to collect background information about SIMS and higher education, as detailed in chapters 2 to 5. A research plan to guide the study was put together, which provided the structure of the thesis as explained in Section 1.9, and a detailed programme or research timetable covering the period of research from 2002-2005. Permission to conduct research was sought from the Uganda National Council for Science and Technology (UNCST) as a legal requirement to carry out the study (see permission letters in appendix 1.3). The permission letter provided by UNCST served as an introductory letter in all areas of research. Informed consent was obtained from the authorities and participants in each area studied (see sample authorisation letters in appendix 1.3). As explained earlier, appointments were made with the respective respondents to obtain their consent for their participation in the study.

### **1.5.6 Pilot Study**

A pilot study was undertaken prior to the main study. Essentially such a study addressed what Phillips (1998:76) referred to as the question: “will it work?” and was to test the research instruments and familiarise the researcher and research assistants with the methodology. The pilot study tried to measure the validity and reliability of the instruments (Dooley 1995:204), and endeavoured to establish the relevancy of the study, the research instruments in the study and the questions put to the respondents.

The results of the pilot study indicated the adequacy of the questions used, and also discovered isolated technical and typographical problems of the research instruments that were corrected accordingly. The pilot study also addressed the administrative and organisational problems related to the whole study, such as obtaining clearances from the top administration in organisations, and being introduced to relevant sections and departments in the area of study. Furthermore, the pilot study helped the researcher to estimate the costs and duration of the main study.

The pilot study helped to establish how diverse or homogeneous the respondents selected for the study should be. It enabled the researcher to familiarise himself with the research environment, test the respondents' responses to the methods of data collection, and discover possible weaknesses. The inadequacies, ambiguities, and problems in all aspects of research were corrected before the actual data collection took place. The pilot study was targeted at respondents that would not have participated in the actual study.

Feedback mechanisms were built into the instruments by posing a final question on how successfully and easily the questionnaire, interviewing, or focus group discussion was conducted.

### **1.5.7 Data Quality Control**

This is a strategy to ensure that data obtained and used in research were up-to-date and accurate (Abrahamson 1983:345). The researcher continuously monitored data and records, as they were collected, comparing responses by respondents, and dealt with the inconsistencies accordingly. The research instruments were cross-examined and pre-tested as explained earlier in 1.5.6. The credibility of the researcher was ensured in the study for the purposes of achieving accuracy and reliability. The principles of research ethics—a distinction between right and wrong during the research (Opuda-Asibo (2001:1), provided by the Uganda National Council for Science and Technology (UNCST)—were followed. The researcher endeavoured to respect the acceptable features of qualitative research design used in this study: informed consent, privacy and confidentiality, and accuracy. The concerns of credibility, objectivity and truth in the perspective of this study were also respected.



### **1.5.8 Data Analysis and Presentation**

A phenomenological analysis, a procedure designed by Colaizzi in 1978, was used for the analysis of data in this study (Sanders 2003). The themes were developed according to the research questions. Data collected was edited, coded, clustered and analysed using data analysis software, AskSam 3.0 Professional, as explained in Section 6.2.7. Data was presented using data summaries, matrices, tables, networks, charts, and narrative text as discussed in Chapter six and seven.

### **1.6 Demarcation of the Study**

The study was carried out in Uganda and it was limited to the education sector. Because the study concentrated on a SIMS for higher education, it referred to student information obtained from other educational institutions that supply it with this information including, business, technical and vocational education training (BTVET), primary teachers colleges (PTC's), and secondary schools, which offer A-levels. The student information captured and managed by UNEB, MoES and district education offices was also considered. For the purposes of this study, student information will refer to that information kept on a student who has completed O-level and has entered any higher levels. The reason for this level of education was threefold. Firstly, higher education receives much of the student information it keeps from the lower levels, starting at this level. Secondly, registration at higher education institutions emphasises the use of student details (including names and index numbers) used at O-level. Thirdly, it is at secondary school level (O-level) that the first recognisable certificate is awarded, which is a prerequisite for entering a higher institution of learning and for any further training.

The study considered data kept about student information, processes carried out in the management and coordination of such information, and events that happen in the management of this information. The data on student information included the type of information kept and used, the purpose for which it is used, the form in which it is kept, and users of that information. The processes included admission, registration and enrolment, processing of examination information, verification of information, compilation of statistics, maintaining security and ensuring protection of information, identification of information and sharing of it. The events that happened in the management of this information and which the researcher attended included attending orientation of students, selection exercises for senior one, senior five, and higher education, while meetings that discussed issues concerning student information were also attended by the researcher.

For the purposes of this study, attention was paid to information relating to students who had enrolled in higher education since 1986. This is the period that accounts for the biggest percentage of changes in the country and the education sector in particular. The changes include the formulation of the Education White Paper, drafting and enacting of the Constitution of the Republic of Uganda, formulation of Vision 2025, introduction of Universal Primary Education, and the enacting of the Universities and Other Tertiary Institutions Act, 2001. These, coupled with the liberalisation of the economy, have had major effects on the education sector. The study however utilises information from the pre-1986 period for background purposes, as a base for analysis as shown in sections 1.1, 3.3 and 4.2. Although emphasis was placed on public (government funded) institutions, 3 private universities (Islamic University in Uganda, Nkumba University and Ndejye University) were selected to provide a more complete view of the situation in the country, as explained in detail in Section 6.2.1.

## **1.7 Definition of Important Terms**

This section explains the operational terms as used in this study. For each term, different sources are evaluated and their relevance as applicable to this study is provided.

### **1.7.1 Information System**

Many authors, including Award (1993:7), and Tudor and Tudor (1997:3), define an information system as a system designed to capture information in order to achieve one or more objectives. According to Soergel (1985:3), the objective of a system is defined by its boundaries, which include identification, acquisition, and dissemination of information. According to him, objectives are a mix of services, which involve the procedures to collect, record, process, store, retrieve, and display information. In fact, Daft (1991:553) enumerates these procedures as including collecting, organising and distributing data to meet organisational objectives. For the purposes of this study, the term information system means a set of procedures, activities and functions to capture, store, process and use data for a common objective.

### **1.7.2 Information Management Systems**

There is no agreed definition of information management systems (IMS). The term IMS refers to a system that manages other information systems. According to Lucy (1997:33), a 'system' is an assembly of parts, where the parts or components are connected together in an organised way. Churchman (1968), as referred to by Busha and Harter (1980:124), also views a system as a set of parts coordinated to accomplish a set of goals. Using the views of Lucy and Churchman, the 'set of parts' implies that in an IMS, there are various information systems that need to be coordinated to accomplish a goal. The IMS should have formats that are common to all the systems coordinated. For purposes of this study, an IMS is a system that coordinates information, procedures, and activities for a common goal.

### **1.7.3 Student**

The *Webster Third New International Dictionary* (1986:902) defines a student as a person engaged in study, devoted to learning or one who attends school. *WorldNet*, (1997:1), an Internet dictionary, defines a student as a learner who is enrolled in an educational institution. It further explains a student as someone who by long study has gained mastery in one or more disciplines. *The American Heritage Dictionary of English Language* (2000) adds that a student is one who is enrolled in or attends school, college or university. *The Shorter Oxford English Dictionary on Historical Principles* (1973) defines a student as a person who is undertaking a course of study and instruction at a university or other places of higher education or technical training. For the purposes of this study, the 'Oxford definition' has been expanded to encompass persons undertaking, or who have registered for, a course/programme in an institution of higher learning or technical and vocational training beyond O-Level, as explained in Section 1.6 of this Chapter.

### **1.7.4 Student Information Management System**

The term student information management system (SIMS) is derived from the term 'student information' and 'information management system'.

Eardley, Marshall and Ritchie (1995:225) define 'student information' as data concerning student information (an entity) in an information system. According to Soergel (1985:30) a student information system is based on an entity (student information) with data that defines that entity (data attributes). This entity has a life history in a system, i.e. it is captured, stored, accessed, and used in a system. This entity has relationships with other entities (e.g. family background, schools attended,

course studied). These relationships are associated with statements, which address procedures, functions and activities within a system. The set of procedures, activities and functions for the capture, storage, processing and use of student information for a common goal/objective constitutes what is referred to as a student information system. The interrelationship and coordination of the functions, activities, and procedures of the entity and data attributes in a system for purposes of making a decision or meeting common objectives comprises what is referred to as a SIMS in this study.

### **1.7.5 Integrated SIMS**

Integration in a system is concerned with how a system is linked together to achieve its central objective (Award 1993:12). The *Webster Dictionary* defines integration as separate parts united together to form a more complete, homogenous or coordinated entity, in this case ‘student information’. Weihrich and Koontz (1995:4) explain the necessity of integration as it brings about collaboration among various parts of a system to achieve unity within the environment for which it is intended. Armstrong (1999:7) refers to Guest (1991) in order to explain the role of integration as ‘the ability of the organisation [system] to integrate issues into its strategic plans [and] ensures various aspects of coherence’ within a system. Hall (1972), as referred to by Rosenzweigh (1995:573-574), explains the aim of integration as being the design of organisational structures for coordination of activities. According to him, integration aims at achieving unity of efforts among the various subsystems in the development of the organisation’s (system’s) tasks. The above explanations indicate that there are three factors of integration, i.e. coordination, standardisation/unification, and identification as shown in Figure 2.1.

In this study, an integrated SIMS will refer to a unified information management system that coordinates an identified entity (student information) within the environment for which it is intended. **1.7.6 Framework for an Integrated SIMS**

The *Shorter Oxford English Dictionary on Historical Principles* (1973:746) defines a framework as a structure composed of parts framed together. *Webster’s Third New International Dictionary of English Language* (1986:902) defines it as a systematic set of relationships that works within a conceptual schema, structure, or a system. *WorldNet* (1997) defines a framework as a simplified description of a complex entity or process. For purposes of this research, a framework for an integrated SIMS will refer to the conceptual schema or strategy for a system to identify, capture,

store, manage, coordination, and use student information in Uganda.

### **1.7.7 Higher Education in Uganda**

The meaning of higher education has changed over time and could also carry different meanings depending on the country or tradition. According to the *World Book Encyclopaedia*, an institution of higher learning is synonymous with colleges and universities (Universities and Colleges 1994:207). It refers to colleges as ‘schools’ that continue a person’s education beyond secondary education. According to the *Longman Encyclopaedia*, institutions of higher education in some cases include secondary education. It classifies these institutions into four categories: public schools, post-secondary schools, universities and training colleges (Colleges 1989:235). The *Macmillan Encyclopaedia* describes institutions of higher learning as educational establishments that specialise in a particular subject or in further education (College 1990:294). *The Shorter Oxford English Dictionary on Historical Principles* (1973:2156) describes higher education as tertiary (belonging to the third series in the system).

In the Ugandan context higher education generally refers to a post-secondary system of formal education or tertiary education (Uganda. Ministry of Education and Sports 1992:87) and in the context of this study, the term will refer to post-secondary, tertiary, or further vocational education [The term post-secondary education will be interchangeably used to refer to tertiary or higher education depending on the context in which it is used].

### **1.8 Significance of the Study**

An integrated SIMS in the country will provide a means to improve the use of student information for effective decision-making in Uganda. Currently, there are uncoordinated programmes and strategies in the development of the Education Sector in Uganda, including NGOs, donors and the government, with regard to management of student information. Some of these programmes and strategies overlap because of the lack of a common approach. A standardised approach will ensure uniformity in the storage and use of student information.

The study will propose a strategy for how a student identification system can facilitate coordination of student information in Uganda. The existence of an identification system will assist other bodies in the country to easily access student information from the Ministry of Education and Sports. The

beneficiaries will include the Ministry of Public Service, when recruiting new graduates, and the Electoral Commission, when screening candidates for elections. The Ministry of Foreign Affairs, NGOs and International Organisations should also find this system useful in the course of recruitment and recommendations for travel and employment abroad. It is envisaged that the output will be useful to other countries that have a similar or related education system.

The study will supplement the government strategy of maintenance and provision of official access to government records in *National Records and Archives Act* (Uganda 2001<sub>a</sub>) and *Access to Information Act* (Uganda 2005<sub>a</sub>). It is also hoped that the strategy will work towards meeting Uganda's Vision 2025 for the development and effective utilisation of information systems and services (Uganda. Ministry of Finance, Planning and Economic Development, 1999<sub>a</sub>:86).

## **1.9 Structure of the Thesis**

The thesis comprises three parts: the preliminary pages, main body (chapters), and the appendices (end matter). The body of the thesis constitutes nine chapters. Chapters will be organised according to themes in the study, which will be broken into sub-themes. Chapters are presented systematically, utilising forward and backward linkages to connect them and strengthen the arguments.

Chapter one introduces the study. It presents the preamble, the background, the problem statement, and the aim of the study and research questions. It also includes an overview of research about the topic, research methodology and a demarcation of the study. Definitions of important concepts, the significance of the study and an outline are also provided in this chapter.

In the second chapter, a conceptual framework for an information management system is discussed. The chapter explains the concept of a system and information system. The chapter reviews models of IMS. The chapter also defines and interprets the conceptual framework in the context of SIMS for higher education in Uganda.

Chapter three examines the current state of the information environment in Uganda. It traces and delineates the socio-economic profile of Uganda. The chapter describes the global strategies and standards in information management. Policies and institutional frameworks, and the development strategies for information management in Uganda, are discussed in this Chapter.

In Chapter four, the current structure for the management of the student information system in Uganda is explained. The chapter explains the structure of the education system in the country and describes the key players in the management of the education system in Uganda and the role of MoES in management and coordination of student information. Coordination strategies and challenges for higher education are discussed and analysed.

In Chapter five, an analysis of student information management systems outside Uganda is undertaken to establish a design strategy for an integrated SIMS for higher education. This chapter describes SIMS for higher education at institutional and national levels. Features of an integrated SIMS are explained and SIMS challenges are identified.

Chapter six explains the state of the management and coordination of student information in Uganda. It establishes the type of student information being kept and how it is shared and coordinated between institutions. It describes the positive attributes of the current operations and also establishes the challenges for an integrated SIMS in Uganda.

Chapter seven examines the system needs and requirements for SIMS in Uganda. The chapter establishes the importance of coordinating student information and also the student information and activities that can be standardised to facilitate coordination. The chapter justifies the need for an integrated SIMS and explains the fears it engenders. The chapter also explains factors to facilitate tracking of this information in Uganda.

Chapter eight summarises and discusses findings of the study, arising from the field study presented in Chapters six and seven, correlating them with the conceptual framework developed in Chapter two and observations already made in other Chapters one, three, four and five to justify for a design of an integrated SIMS for higher education in Uganda.

Finally, Chapter nine presents the conclusion and recommendations of the study. A framework for an integrated SIMS for Higher Education in Uganda is designed, which takes account of the gaps reflected in the conceptual framework discussed in Chapter two. This chapter deals with the main aim of the study. Evaluation criteria and their implications for higher education are provided.

## **CHAPTER TWO**

### **DESIGN OF INFORMATION MANAGEMENT SYSTEMS: A CONCEPTUAL FRAMEWORK**

#### **2.1 Introduction**

As is the case in most systems, the design of information management systems (IMS) requires a strategy to fit in the environment for which the IMS is intended. In chapter one, the background to a student information management system (SIMS) for higher education in Uganda, and what the study is intended to achieve, were explained. In the same chapter, the operational concepts applied in this study were defined. In the present chapter, the concepts 'system' and 'information systems' are explained in detail. The models that attempt to explain the design of an IMS are also reviewed. This chapter ends by defining a conceptual framework for IMS and interpreting it in the context of this thesis.

#### **2.2 The Concept 'System'**

##### **2.2.1 Introduction**

There is no single generally accepted definition for 'system'. The concept as applied to information management has been defined in various ways depending on the environment for which it is intended. The concept originated from the concept of a 'unit' as a dimensionless quantity developed by Shannon and Weaver in 1949 (Brillounin 1971:2). Since then, the idea of a 'system' has changed in meaning and context.

Several attempts, including those of Fishman (1973), Karnopp and Rosenberg (1975), Lucy (1995) and Turban (1995) have been made to define the concept 'system' in terms of the objectives for which it is intended. For example, Turban (1995:38) defines a 'system' as a collection of objects linked for an identifiable function or goal. The goal of a system, according to Kroenke and Hatach (1994:21) and Turban (1995:42), is to receive input from the environment, process it, produce an output, and feed it back to the environment.

Alternatively, the concept 'system' has been defined in terms of the interrelatedness of its parts. For



example, authors like Rao and Narayana (1987:97); Lucas (1992:9); Close and Fredrick (1993:2); Lucy (1995:33) and Cochin and Cadwallender (1997:1) define a 'system' in terms of the interrelatedness, interdependence, and interaction of elements. For instance, Lucy defines a 'system' as an assembly of parts, where the parts or components are connected together in an organised way.

The two views explained above to define the concept 'system' suggest that a 'system' possesses parts or components, which are coordinated to achieve a set goal. For example, Kroenke and Hatach (1994:21) argue that 'a system' seeks to achieve a set of related goals and shares a common model of action. Tudor and Tudor (1997:3) share the views of Lucy (1995:33), Churchman as referred to by Busha and Harter (1980:124) and Kroenke and Hatach but emphasise the sense of purpose of a system and the way in which different elements interrelate with one another. They thus define it as 'an organised way of doing something specific' (Tudor & Tudor 1997:3). In fact many authors including Lucy (1995:43), Underwood (1996:21), Banathy (2005) and ACKoff Centre for Advancement of System Approaches 2005) contemplate systems as consisting of different specific types depending on the environment as explained in the preceding subsection.

### 2.2.2 Types of systems

In contemplating systems, the identification of the types of systems is a crucial issue. The following types of systems are often identified:

**Natural or ecological systems:** These consist of groups of entities which occur by an act of nature, and which can sensibly be treated as a whole, having describable properties (Underwood 1996:21; Ackoff Centre for Advancement of System Approaches 2005). Such systems range from subatomic systems to living systems of all kinds, a planet, a solar system, galactic systems and the universe (Banathy 2005).

**Designed systems:** These systems consist of collections devised by people, which can be concrete, such as machines, or include abstract ideas such as index languages. According to Banathy (2005), these are created by man [sic] and include designed conceptual systems (such as theories, philosophies, mathematics, logic, framework, models) and their representations in the forms of books, records and descriptive or perspective models.

**Human activity systems:** These are systems which consist of humans engaging in some purposeful activity such as reading, discussion, and sports (Underwood 1996:21). Furthermore, they are

manifested in sets of activities (relationships) carried out by people who select and organise these activities to attain a purpose (Banathy 2005).

**Social systems:** These consist of collections of people interacting in some way, such as work groups, families, social groups (Underwood 1996:21). Social systems have purposes of their own and could be part of one or more larger systems that contain other social systems (ACKoff Centre for Advancement of System Approaches 2005).

Systems can also be classified in terms of such considerations as the degree to which systems and subsystems behave according to predictive behaviour, thus being deterministic, probabilistic or stochastic, or self-organising systems.

**Deterministic or mechanistic systems:** These are predictable systems where the output can be predicted from the input. These include computer systems, bureaucracies, national educational systems, and a business operation (Lucy 1995:43; Banathy 2005). These systems have no purpose of their own but their essential parts make possible the functions of the whole. For example an automobile has no purpose of its own but serves the driver's or passengers' needs (Ackoff Centre for Advancement of System Approaches 2005).

**Probabilistic or stochastic systems:** These occur where some conditions of the system can be predicted from the previous state, but only in terms of probable behaviour, and there is always a certain degree of error attached to the prediction of what the system will do. Examples include an inventory control system, and most industrial and business systems (Lucy 1995:43).

**Self-organising or adoptive or cybernetic systems:** These systems adapt and react to inputs or stimuli. The method of adoption is uncertain and the same input does not always produce the same response. Social systems and organisations fall within this category (Lucy 1995:43).

Furthermore, systems can be classified according to the nature of the set goals, thus being heuristic or purposive systems (Banathy 2005).

**Heuristic systems:** These systems formulate their own goals under some policy guidelines. They are necessarily open to changes and interact with the environment. Such examples include new business ventures, research and development agencies, and non-traditional educational programmes.

**Purposive systems:** These systems are unitary and have their goals set. These are considered to be somewhat open in that they are intended to react with the environmental changes. These systems have freedom in selecting operational objectives and methods. Examples include corporations, public service agencies, or public education systems.

To others, the concept 'system' has to do with the 'whole' (having all its parts or elements complete) as a subject or object of science. For instance, Award (1993:7) refers to Wiener (1948), a mathematician who observed that information and communication provide connective links for unifying fragments or elements. He also refers to Simon (1965), a political scientist who views a system as a processor of information for decision-making. In addition, Award (1993:7) refers to Von Bertalanffy (1968), who believes that a 'system' means 'complexities of elements standing in interactions' (Blauberg, Sadovsky & Yudin 1977:47). Award (1993:7) thus hypothesises that the interdependence of components linked together in a 'system' must have a specific objective to achieve. This hypothesis echoes von Bertalanffy's (1968) general systems theory that applies to any arrangement of elements, independent of their substance, type, or spatial or temporal scale of existence (Heylighen 1992), as will be explained in the next section.

### 2.2.3 General Systems Theory

The basic idea of General Systems Theory dates back to 1937, when Ludwig von Bertalanffy advanced his or the general principles of systems science (Blauberg *et al.* 1977:52). Ludwig von Bertalanffy was a Hungarian biologist who fathered an orgasmic concept of life into the general theory of biology (Provost [*S.a.*]), that later became a foundation of general theory of systems (*PSICAFE: A Psychology Resource Site* 2005). Systems science involves understanding man [sic] and his environment (Skyttner 2001:5). Understanding man requires a system interacting between man and the environment. According to Skyttner (2001:38), systems science is a traditional science of all systems, including and embracing man.

According to Ludwig Von Bertalanffy, systems can be distinguished by examining three stages through which each system develops (Blauberg *et al.* 1977:47). The three stages are: organised simplicity (the world of classical mechanics), unorganised complexity (the world of classical static/physics), and organised complexity (reached by 20<sup>th</sup> century science) (Blauberg *et al.*

1977:53). Von Bertalanffy (1968), however, asserts that the fundamental problem is that of organised complexity and postulates a general systems theory as a ‘general science of wholeness’ (Von Bertalanffy 1968:37). He thus explains the characteristics of general systems theory in terms of the following features:

- ◆ There is a general tendency for systems to integrate into the various environments they are intended for.
- ◆ The integration of systems in any environment seems to be centred on the general principles that are present in all systems.
- ◆ The unifying principles of any system developed should aim at achieving the goal of unity.

He contends that the general systems theory does not explain the value of the principles — what the economist Hayek termed ‘explanation in principle’ (Self-Organisation of European Information Society 2002:6). He believes that system principles should aim at achieving certain objectives and goals to meet the needs of the environment in which a system functions. In fact Burnes (1996:59, 138) stresses that systems should link the internal and external forces, in managing change to achieve the organisation’s goals. The linkage (interrelatedness and interdependence of systems, organisations, boundaries, system feedback and the environment) constitutes the openness or closedness of a system (Blauberg *et al.* 1977:43; Kendal & Kendal 1992:27-28). The open system, according to Kendal and Kendal (1992:29) and Award (1993:18), exchanges information with its environment to ensure survival and adaptation to changes. On the other hand, a closed system is one that does not interact with its environment.

Skyttner (2001:49) interprets a ‘general systems theory’ of open systems by drawing attention to various writers such as Kenneth Boulding (1964), Joseph Litterer (1969), Churchman (1971) and Downing Bowler (1981), and emphasises that open systems should have equal and valid, alternative ways of attaining the same objectives from different initial conditions, depending on the environment intended.

For a system to achieve a goal in any environment (e.g. public education systems), for which it is intended, it is important to define its characteristics or features. This is why it is important to design a system to be able to achieve its goals in a specific environment. The succeeding subsections explain the characteristics and design of a system, to complete the view of the concept ‘system’.

#### **2.2.4 System Characteristics**

The quality of a system is largely dependent on its characteristics and components, which have been explained by various authors, including Blauberg *et al.* (1977:55), Kast and Rosenzweigh (1985), Lucas (1992), Award (1993), Kroenke and Hatach (1994), Eardley *et al.* (1995), Lucy (1997), Tudor and Tudor (1997) and Krieger (1998). For example, Award (1993:12) lists the characteristics of a system as:

**Elements:** They include inputs, processes, outputs, environment, control, feedback, goals and boundaries.

**Organisation:** This involves the arrangement of components, objectives, relationships, flow of information.

**Interaction:** This is the manner in which each component functions in relation to other components of the system.

**Inter-dependence:** Systems need to be coordinated and linked according to plans; one subsystem depends on an input from another. Furthermore, the output of one subsystem can become the input of another subsystem. According to Lucy (1997: 35), systems are hierarchical and the parts of the subsystems are made up of other smaller parts.

**Central objective:** This includes the real or stated objectives, including common objectives, strategies, plans and goals.

**Boundaries:** Each system has boundaries — the limits that identify its components, processes, and interrelationships when it interfaces with another system.

**Integration:** The integration of a system depends on how its parts are tied together and how they interact with the environment in which the system functions.

Understanding the environment helps in designing a system (Kast & Rosenzweigh 1985:108). According to Tudor and Tudor (1997:3), the environments with which systems interact, are functional (what), social (values) and political (people's welfare). In order for the elements of a system to interact, a management structure, to integrate itself into the environment it is intended for, is required. Such a structure will enable easy capture, storage, access and dissemination of information and control of the organisation (Bell 1985:25). Actually, Skyttner (2001:38) contends that when designing systems, care should be taken so that no important factors in the structure are excluded. It is therefore important to design a system in a defined structure within the environment for which it is intended.

## 2.2.5 System Design

Like all other man-made objects, the quality of a system is highly dependent on its design (Angell & Smithson 1991:169). Designing a system carefully ensures that it will achieve the desired goal (Lucas 1992:17). This also requires a careful analysis of the problem and establishing the needs of a system (Mumford 1995:42). 'Design' involves generating, developing and analysing possible courses of action, and provides detailed specifications for system components, structure, and their features (Turban 1995:48). System design also involves the identification of entities, relationships and their data attributes (Soergel 1985:138; Award 1993:262; Eardley *et al.* 1995:192). According to Laundon and Laundon (1993:366), the design should show how the technical, organisational and people components of the system fit together. This is why it is important to analyse a system to provide a design strategy in a given environment. While system analysis shows what the problems are and what has to be done about them (Eardley *et al.* 1995:191 and Tudor & Tudor 1997:7), system design shows how the system should be realised in practice (Laundon & Laundon 1993:337).

Although system design is normally considered as a problem solving function in the most traditional view, a more modern view perceives it as modelling and solving model responses in a system (Flaatten, McCbbery, O'Riorden & Burgess 1992:77). Implied here is that system design requires not only modelling but also providing a strategy for how a problem is solved (Laundon & Laundon 1993:366). In this case, various authors, like Busha and Harter (1980:123); Lucy (1983:62); Zwass (1998:24); Robbins (1989:28); Flaatten *et al.* (1992:77); Oakshott (1997:8) and Turban (1995:42) have referred to a model as an abstraction of the real world. To Flaatten *et al.* (1992:77) a model is a conceptual design of the system. The representation of the system through models can be done at two levels (Cleland & King 1983:23): simple system models and complex system models. The latter shows the relationships of the internal environment (operational and transaction systems), operating environment (inputs, outputs, regulatory) and the general environment (legal, socio-economic, and technical) (Cleland & King 1983:23). Skyttner (2001:40) refers to Gigch (1978), who disassociates design from system improvement. He refutes the belief that 'those who cannot manage change [sic] be ahead of it' (Skyttner 2001:40). He adds a further dimension and contends that design replaces guesswork by model building.

Model building (modelling) and model use provide a framework for managing a system (Cochin & Cadwallender 1997:8). In modelling, there is a need for integrating all the variables and parts of a system with the external environment or factors (Lucas 1992:90). This requires proper identification of the key variables, and establishing relationships between them during consideration and

formulation of the model (Ikoja-Odongo 2002:391). This is why identification of the elements is an important design strategy to facilitate integration of a 'system' into its socio-economic environment.

The concept 'system' therefore as used in this study denotes a purposively designed model whose identified elements and their relationships within a management structure are integrated into the environment for which it is intended.

### **2.3 Information Systems**

Like other systems, information systems exist in a context. There have been divergent views as to what constitutes an information system. The available literature contains no consistent definition of the concept. However, there is a plethora of other concepts, which are often used interchangeably in explaining the meaning of an information system (Rowley 1994:24 and Adman & Warren 1996:33). Some of these concepts are management information systems (MIS), transaction information systems, decision support systems, executive information systems, data processing and office information systems. Soergel (1985:3), Adman and Warren (1996:32), and Zwass (1998:5) view an information system as a set of interrelated components which work together to produce 'information' in a usable form for the purpose of strategic formulation and operational planning, controlling operational activities, and facilitating decision making.

Most of the explanations that attempt to define the concept 'information system' associate it with the type of information and functions to be performed using that system in the intended environment and thus referring to management information system. The next sections will explain the concept 'information', a management information system, the structure of information systems, and the integration of information systems.

### **2.3.1 The Concept of ‘Information’**

In information theory, information is regarded as an entity, which alters the uncertainty of the receiver (Higgins 1976:1). Information theory is the science which deals with the concept ‘information’, its measurement and its applications (Van der Lubbe 1997:1). According to van der Lubbe (1997:1), there are three types of information: syntactic information, related to the symbols from which messages are built up and to their interrelationships; semantic information, related to the meaning of messages, their referential aspect; and pragmatic information, related to the usage and effect of messages. The use of messages as explained above describes the facts about the object. Furthermore, the information content of such a message comprises the effect it has on the image of a person who can understand the message. Therefore, ‘information’ is the effect to which the meaning of an object is attached.

In information management, information is used in a more general sense to encompass all the different ways of representing facts and events within an information system (Webb 1997:184). Information is a meaningful set of data that tells one something about the relationships between data (Award 1993:507). According to Lucy (1995:15), whereas information is the processed data, data themselves comprise facts, events, and transactions, which have been recorded. Data are the raw materials from which information is produced (Jones 1982:7; Lucy 1995:15). In order to produce information, an ‘information system’ is required to input such data, to process and store that data and to create information. Information systems consist of entities, which are connected through relationships (Soergel 1985:23). An entity in this sense is something of interest to the user concerning which data to collect or store (Award 1993:343). According to Award (1993:343) and Beynon-Davis (1993:118) the entity (e.g. student information) possesses data attributes such as name, sex, age and qualification. So data constitute a representation of the perceived attributes of ‘information’ (entity). The relationships between entities and attributes describe an ‘information system’. To identify, process, store, retrieve, disseminate and use information about such entity in a ‘system’ requires a management information system.

### **2.3.2 Management Information System**

Donnelly, Gibson and John (1981:411) defines a management information system (MIS) as an organised, structured complex of individuals, machines, and procedures for providing pertinent information from both the external and internal sources. Robson (1997:83) views a MIS as an instrument of an organisation that represents the elements of a system. Such elements are input



system, process, storage, and output systems. Robson (1997:81) further describes MIS as including everything from routine data processing, through transaction-processing activities, to a decision support system. Robson (1997:85) however notes that although early MIS emphasised data input, currently the output seems to be more significant and therefore needs to be emphasised in the design of an information system. Robson (1997:89) recommends the MIS triad model of Brookes *et al.* (1982) in the management of information systems. The MIS triad is based on three components:

- User (needs, system problems, choice of design and project control);
- Board (policy on priorities, objective setting and monitoring, budget policies, MIS needs and master plans); and
- Information system (options of project design, cost and benefit proposals).

To articulate user needs and set realistic objectives for an information system, a strategy is required to define the structure (boundaries), the components of the system and their integration into the intended environment.

### **2.3.3 The Structure of an information system**

To link various systems requires structures to re-organise and re-orientate systems in order to provide user-centred information services (Adman & Warren 1996:139). When designing a system that is to serve more than one information system, it is better to design such a system around a consistent system structure in areas of technical services, security services, database access, and database development. Ives (1991:139) describes three main elements of an information system structure as being: a strategy, information systems, and current and predicted information flows. He notes that an information system structure depends heavily on the scope and continuous review of the service requirements of the operations. The protocol and management requirements and transition issues are important stages in the successful operation of an information system structure. Ives (1991:171) provides what he has called the ten golden rules for successful design of an information system structure. These are:

- (i) Identify strategic systems applications that will have the greatest impact on the bottom line.
- (ii) Finish the process by setting quantifiable and prioritised objectives for systems before installation.
- (iii) Let the quality of the software application drive the technology selection, not vice versa.

- (iv) Integrate the requirements into the budget and time allocations.
- (v) Involve the perspectives of users.
- (vi) Design systems that adhere to key industry standards.
- (vii) Build scalability into a system to avoid being forced into premature system redesign.
- (viii) Design for maximum usability.
- (ix) Design networks around departmental and central repositories for business information.
- (x) Design for maximum systems uptime; reliability, effective backups and recovery procedures to guard against loss of data.

The structure of an information system should comprise not only the network that coordinates the system but also the storage of information in the repositories for the purposes of data warehousing (Sammon & Finnegan 2000:83; Visser [*S.a.*]:65). Data warehousing is a storage of consistent historical data, which can be accessed easily and can be manipulated for decision making. This requires a familiarity with the data and the information needs of various organisations (Hasan, Hyland, Dodds & Veeraraghvan 2000:16).

For effective use of data, networks require links and coordination. The coordinating and network systems should possess standards (e.g. protocols) in their management operations and ensure collaboration among the partners, which provide elements of the framework for a system. However, coordination of different organisations requires proper identification of entities (e.g. student information). The design of an information system should integrate people, organisations, technology, and the socio-economic, technical and political environments. Hence standardisation of procedures in terms of policy, strategy, uniformity, access; coordination strategies in various systems and subsystems; and most of all proper identification of information to be coordinated in the systems are required.

#### **2.3.4 Integration of Information Systems**

Integration of systems results when two or more systems are linked to and are interdependent of each other, and are coordinated to operate as if they were one system (Douglas and Glen 2000:686).

The linkages between systems facilitate the flow of information (Bossink 2002:195). What is needed in integrating a system is to determine which information is relevant to the organisation (Duffy 1980:28). To determine relevance, there is a need to identify such information for its proper coordination in the system. Problems of coordination and compatibility arise when systems have

many subsystems (Hussain 1977:23). Hussain argues that integration works in all directions. These he names as horizontal, vertical, longitudinal or functional integration. Turban (1995:758), on the other hand, thinks of integration as functional and physical. To both authors, functional integration ensures that services in a system will deliver data to achieve the desired goals. For example, according to Turban (1995:758), functional integration is more likely to facilitate coordination if it addresses a society's needs and requirements in the design of an information system. Actually Wilkson and Dale (1999) refer to this as full integration (Douglas & Glen 2000:687), which involves linking information shared by various information systems (Douglas & Glen 2000:687) into a coordinated IMS. The next section reviews and describes models for IMS.

## **2.4 Review of models for Information Management Systems**

This section reviews models that undertake to explain the design of information management systems (IMS). The review is aimed at identifying the issues or characteristics that are important and helpful in the design of an IMS model, and will also analyse the extent to which identification of elements in a system can facilitate its integration into the environment for which it is intended.

Various models related to IMS have been developed and reviewed by various researchers. For the purposes of this study, only those models that are relevant to the higher education environment have been reviewed: information systems management, information systems analysis, and information systems design and development.

### **2.4.1 Information Systems Management**

Galliers and Sutherland (1994:91) refer to the Nolan Model [1979], the Earl Model [1986, 1989,1993], the Bhabuta Model [1988] and the Hirschheim *et al.* model [1988] to explain the various models for information systems management.

#### **a) The Nolan model**

The Nolan model, normally referred to as the six stage model, is based on the premise that organisations pass through a number of identifiable growth phases when introducing new systems.

The six stages of the model are initiation, contagion, control, integration, data administration, and maturity. All these stages contain the four major growth processes for maturity: the application portfolio, organisation, planning, and user awareness. According to the Nolan model, information systems management focuses on technology in its earlier stages, after which the focus is on managing the organisation's data and utilising databases for the purpose of accessing information (Galliers & Sutherland 1994:93). Managing the organisational data requires proper identification of an entity for which data is stored in a database. There is also a need to set standards in order to enable identified data to be coordinated. The model is built on the foundation of information technology and assumes the same level of growth in different parts of the system, with respect to particular technology and resources. Information technologies are important for the design of the system if the structure of an information system is defined in terms of how the identified data can be integrated into such an environment.

#### **b) The Earl model**

King and Kraemer (1984), referring to the Nolan model, proposed the 'Earl Planning Stages Model' (The Earl Model) (Galliers & Sutherland (1994:94). The model concentrates on the stages of and factors in planning. These factors include the task, objectives, the driving force, the methodological emphasis, and the context within which planning takes place. For example, the Earl planning stages comprise meeting demands, an information systems audit, business support, detailed planning, strategic advantage and business-information technology strategy linkage. The Earl model implies that on the basis of the objectives, systems should integrate strategies into their design. It follows that there is an expectation of system maturity and collaboration (Galliers & Sutherland 1994:95). Such strategies facilitate a model's integration into the socio-economic environment for which it is intended.

#### **c) The Bhabuta model**

Based on the work by Gluck *et al.* (1980), the Bhabuta model attempts to map progress towards formal strategic planning in information systems (Galliers & Sutherland 1994:95). The Bhabuta model, also known as the four-stage model, is based on functions which attempt to map the progress towards the strategic planning of information systems, which in turn requires integration of the operational, tactical and strategic functions in the organisation. This model is in fact more widely focussed than the Nolan and Earl models in that it attempts to bring together further elements:

strategy formulation, information system, and mechanism of formulation (Galliers & Sutherland 1994:96). These elements require an identification strategy to enable full integration of the model into its environment.

#### **(d) Hirschheim *et al.* (1988) model**

The Hirschheim *et al.* (1988) model was built on the basis of an earlier model by Nolan (1979), and functions on the assumption that companies, where top management has begun to realise that information systems are vital, and move through revolutions. The model is based on three phases of changing considerations regarding information systems management: delivery, re-orientation and re-organisation. The re-organisation of information systems requires the integration of the socio-economic needs of the organisation, and management needs. This, however, requires proper coordination and identification of the system entities.

#### **(e) Stages of the Growth Model**

Galliers and Sutherland (1994:96) refer to the previous models: Nolan, Earl, Bhabuta, and Hirschheim *et al.* and to the Seven 'Ss' model in order to develop their stages of growth model. The Seven 'Ss' model was devised by Waterman *et al.* (1988) to describe the strategy for developing an information system in any organisation (Adman & Warren 1996:92). The Seven 'Ss' are:

1. Strategy: Plan or course of action.
2. Structure: Characteristics of organisational chart, functional/decentralised.
3. Systems: Procedural reports and routine process.
4. Staff: Description of important categories of personnel.
5. Style: Characteristics of how managers behave.
6. Skills: Distinctive capabilities of key personnel.
7. Subordinate goals: shared values, or culture, etc.

The stages of the growth model developed by Galliers and Sutherland from a review of the previous models works on the assumptions that systems mostly lack coordination, so they require a strategy for integration and control. Identification of system elements is a fundamental factor for a system's coordination and its integration into the socio-economic environment for which it is intended.

The models described above provide indicators for a coordinated information management system,

and describe elements in the growth of computing that are essential features in the design of a system. They also emphasise the need for systems to develop strategies for the integration of a system into its environment.

#### **2.4.2 Information System Analysis**

According to Ewart (1985:271), the development of information systems is not only a technical process but also a political one. Achieving a major success with large, integrated systems that are combined with the traditional systems requires the organisation to analyse the existing system. RAND Corporation is credited with having fostered the development of the system analysis approach (Underwood 1996:22). Explaining a system analysis approach, Jacquot and Finance (1990:319) assert that a good information system depends slightly on the equipment, a great deal on human technical backup, and, most of all, on how the system is organised. They believe that it is the way in which a system is organised (structure, design and its integration) that determines its success. This requires the establishment of information requirements in an effort to organise such systems. According to Ewart (1985:271), the major challenges of organisations (especially in higher education) are to plan, manage, and control the development and operation of such information systems. This requires an information analysis process as an institutional research activity to establish not only what information is required but also why and to what purpose it is to be put.

Various models of information analysis have been developed. The most common approach to analysing systems is the 'systems life cycle' (Soergel 1985:71; Burn & O'Neil 1987:51; Angell & Smithson 1991:167; Eardley et al. 1995:190; and Augeron & Cornford 1998:43). The systems life cycle model has been widely applied in the analysis of systems. This has been the backbone of research and practice since 1960 (Angell & Smithson 1991:167). The model works on the assumption of steady uni-directional progress through the various stages, without going back or repeating them. The cycle involves the conceptualisation of the idea, initiation, design, assembly and testing of system rules and specifications, installation, operation and maintenance (Soergel 1985:71). Angell and Smithson (1991:169) summarise the model in four stages: problem identification, analysis, design and operation. Analysis of the requirements requires studying the technical, legal, organisational, and socio-economic feasibility aspects (Augeron & Cornford 1998:51). This determines what the new system will do (Angell & Smithson 1991:169). Jones (1982:37) distinctively described two features of system design when referring to higher education:

1. The major reference entities (individuals, groups, organisations) about which data should be

collected. Jones identifies reference entities as the institution itself, the student body and its critical constituents, and related interest groups. The institution is concerned with the providers of education, and the students constitute potential students and the current student community and society, which envelops the institutions and critical constituents, termed as the remote environment.

2. The appropriate descriptors for each of the reference entities. The descriptors identify what needs to be known about the reference entities.

Implied in the Jones model is that each entity should have identifiers, and the descriptors should establish the circumstances or status of the reference entity: what the entity is; what the details are about the entity (entity attributes); and the state of association between the entity and others. For such a system to be integrated into the environment, the entity must identify itself to facilitate the coordination of information within the system.

### **2.4.3 Information Systems Design and Development**

Various authorities, including Oliver & Chapman (1993:226), Downs (1992:123), and Eardley, *et al.* (1995:201), have discussed the design and development methodologies for information management. In particular, Eardley *et al.* (1995:201-204) describe them as process-driven, data-driven, and user-driven development systems. They explain that process-driven approaches emphasise functional decomposition, which includes the strategic, tactical and operational transactions.

Data-driven approaches concentrate on what Gerritsen and Zisman (1976:77-79) illustrate by means of the structure and the designer's model of the organisation's database. They describe the relationships as one-to-one, one-to-many, and many-to-many. This model determines which data is to be stored and what relationships exist between data elements. The model exhibits three important features: the entities, attributes and relationships. The model is typified as an entity-relationship model (Downs 1992:123). The identification of entities and their relationships facilitates the drawing up of a logical data structure (Downs 1992:131).

The user-driven methodologies emphasise partnerships between users and analysts (Eardley *et al.* 1995:202). Downs (1992:2) and Eardley *et al.* (1995: 201) refer to various methodologies for information systems design, like STRAIDS by Gane and Sarson (1979) and MODUS to explain the

most commonly used approach, which is the Structured Systems Analysis and Design Method (SSADM). SSADM is a way of organising the system analysis in order to design the required information system (Downs 1992:2). It is based on a general-purpose methodology that claims to combine features of process, data, and user-driven approaches.

SSADM involves investigation of the current environment, setting objectives and developing the socio-technical design (Downs 1992:27; Mumford 1995:107). Information analysis tools and the entity's life history are crucial in the identification of system elements for purposes of coordination and the system's integration into the socio economic environment.

To recapitulate regarding the foregoing models of IMS, it can be observed that the design of an information management system requires a thorough understanding of the environment so as to properly define its organisational structure that in turn defines the boundaries of the system. It is clear that planning a strategy is important for proper coordination of the system's elements. The need for coordination and standardisation seemed to be crucial in most of the models.

## **2.5 Research Gap**

Despite the limitations enumerated in the IMS models, information management has proved instrumental in a particular context and under particular conditions. The issues, such as the structure of an information system, components of an information system, coordination of information and information sharing are pertinent in the explanation of a design for IMS.

Information systems function within a particular environment. However, the organisational structure delimits the system's contextual boundaries. From the literature reviewed, it is clear that standardisation of procedures, formats, and data facilitates coordination of various information systems. It also appears that integration of system needs in the design of an IMS requires an identification system. However, no study has been done regarding how a system identifying an entity can facilitate its integration into the design of a system framework. Nevertheless, some of the features observed in the review are relevant to the design of an IMS for the Ugandan environment. This study therefore conceptualises variables that guide the design of a framework for an information management system (IMS), as presented in the next section.

## **2.6 Conceptual Framework for an Information Management System**



A conceptual framework defines a structure within the design that is developed (Murdick 1986:507). It is a general presentation that will be based on previously established observations stemming from the literature reviewed on a system, an information system and IMS models. Key issues (variables) and their relationships are identified to guide the development of a framework.

The discussion of the conceptual framework is guided by two questions:

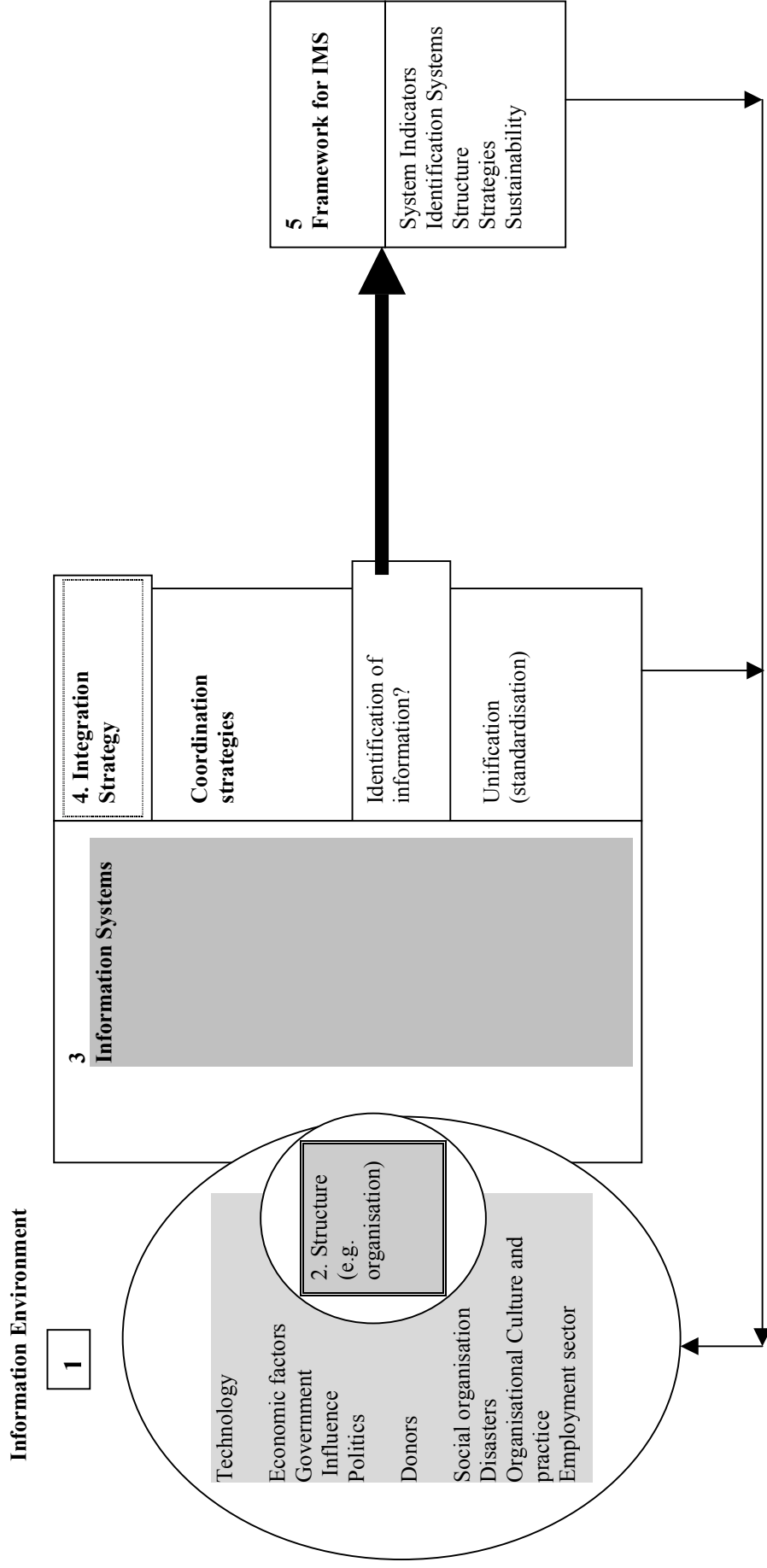
- ◆ What issues or variables attempt to address the concept ‘information management system’?
- ◆ To what extent did the system answer the question on how identification of system elements can facilitate integration into the environment for which it is intended?

The literature reviewed in the previous sections of this chapter has shown that there is no single system that can be solely relied upon to design an IMS for higher education. Most attempts show a need to coordinate information, wherever it exists, into a system to facilitate its use.

From the previous sections and based on the objectives of this study, five basic variables of study and their relationships were identified that constituted the constructed conceptual framework for an IMS (See figure 2.1). The features of an IMS considered in this study are ESSIF, referring to environment, structure, information system, integration, framework as explained below.

1. (Information) Environment: This includes the socio-economic, political and technological environments.
2. Structure: This includes relevant formal and informal systems and institutional structures, which form the contextual boundaries (for example for a SIMS in Uganda, the education system and structure in general and higher education in particular).
3. (Information) System: e.g. a system involved in the capture, storage, access, retrieval, sharing and dissemination of information as discussed in Section 2.3 of this chapter.
4. Integration (Strategy): coordination, standardisation (unification) and identification of a system. This is the gap that requires investigation. For any system, it is important to establish its current state in the structure and system needs and requirements in order to be able to design a strategy for its integration into the environment intended.
5. Framework of IMS: This is the perceived designed system (framework). The conceptual framework for an Integrated IMS is presented in Figure 2.1 on the next page.

**Figure 2.1: Conceptual Framework for an Information Management System**



## **Description of Figure 2.1**

Information environment (labelled 1) represents the socio-economic and technological environment in which an information management system (IMS) is designed for a defined structure (Box 2). To integrate information systems (Box 3) into the information environment, it requires a strategy (Box 4) to design a framework (Box 5) for such a system.

## **2.7 Interpretation of the IMS Conceptual Framework**

This section interprets the constructed framework by examining its components. The components have been labelled and numbered 1 to 5: information environment, structure, information systems, integration strategy, and framework for IMS. The interpretation is based on the issues that are fundamental to the application of SIMS for higher education.

### **2.7.1 Information Environment**

The conceptual framework considers societal values, culture, practices and principles. Particularly, the nature, characteristics, and the needs of society are fundamental factors in the design of SIMS. The environment (numbered 1 in Figure 2.1) covers social, economic, political, and historical perspectives and their relationships. Legal issues and technological revolutions also have an impact on society. These environmental factors interact on an information management system in any organisational set-up. For example, changes in technologies may affect the data capturing methods, which may require legislation and strategic planning. In the concept of a SIMS for higher education, the factors that affect the success of the SIMS include: education structure in the country; policy and legislation regarding education and information management; international and donor influence on government programmes, as discussed in Chapter Three.

The structure within which a system is designed has an influence on a SIMS. Co-operation of educational institutions both within and outside the country also influences a SIMS. Formal and informal pressure groups with an interest in education, information management and related beneficiaries, like trade unions and associations might wish to influence the implementation of a system. Political will and leadership affect the implementation of any system in any country. Advocacy, policy and strategic plans of government are fundamental contributors to the design and

implementation of a SIMS. It is therefore important to review the socio-economic environment in Uganda (as discussed in Chapter Three) to ensure its integration into the design for a SIMS.

### **2.7.2 The Structure (e.g. Education Structures)**

Organisations are established for a specific purpose. Organisations (e.g. the Ministry of Education and Sports) (labelled 2 in Figure 2.1) have their own strategic plans for their vision, mission and goals. In an effort to share information in organisations and for this information to be effectively utilised by the intended users, there must be proper linkages (systems and structures) within the organisations themselves and between them. Some of these systems and structures are formal and others are informal. They are determined by the organisational infrastructure, the technology and the activities performed by those organisations. The structure of the education system (as discussed in Chapter Four) affects the flow of student information. The examination boards, and structures in universities and other institutions of higher learning with their visions, missions, and strategic objectives, influence the use of information in the country. The National Council for Higher Education and the Ministry responsible for education in the country will likewise contribute to the success or failure of a SIMS.

### **2.7.3 Information Systems**

An information system (numbered 3 in Figure 2.1) inputs data, processes it, and outputs the results, i.e. the required information. Information systems comprise subsystems, some of which belong to more than one system. These systems sometimes overlap. Systems may include company systems, national systems, departmental/distributed systems and centralised or hierarchical systems. Each of the subsystems receives inputs and many interconnections may exist within the same system.

Systems interact with the environment and other systems or organisations, and produce information for particular users. Information systems store data in a central place, depending on the nature and availability of technology and the management structure (various approaches to information systems are explained in Section 2.3). The SIMS (as explained in Chapter Five) are determined by the activities carried out regarding student information, as in admission systems, enrolment information systems and exam information management systems. The ultimate goal of an information system is to produce information about an entity (student information) as required by the users. This

information is characterised by its nature, and the format in which it is stored as well as any functions, activities, processes and events relating to the entity, the relationship of the entity with its attributes and other entities in higher education, and how it can be identified. Chapter Six establishes the state of management and coordination of student information in Uganda.

#### **2.7.4 Integration strategy**

The design of any information system should provide a strategy for integration. This facility creates an opportunity for effective exchange and flow of information among users and between organisations and their environments. Among the facilitators of integration (labelled 4 in figure 2.1) are the coordination strategies, the unification (standardisation) of procedures, data formats, and data capture and an identification system for the entity (student) in question. The coordinating strategies in place include linking activities in organisations and systems, and the sharing of information on students, systems and institutions.

#### **2.7.5 Framework for SIMS**

The primary purpose of the study is to design a framework for an integrated SIMS for higher education in Uganda. The design for a SIMS determines the type of student information to be stored, the relationship between entities and information about an entity. It establishes a strategy for an entity identifier (a student identification system) facilitates integration in the design. It provides indicators that show an effective SIMS, which provide a basis for further investigation, evaluation and analysis of the problem. The framework stipulates the kinds of policies, and strategic guidelines, needed for effective implementation of SIMS in Uganda or any other part of the world if required.

### **2.8 Conclusion**

In the process of reviewing theories, approaches and models for this study, some very relevant elements and aspects that could assist one in the design of an IMS are identified. To design a system, it is important to define structure within the environment for which it is intended. To understand the information environment for a Ugandan SIMS, the next chapter, Chapter Three, provides background information on the situation in this country.

## CHAPTER THREE

### THE STATE OF THE INFORMATION ENVIRONMENT IN UGANDA

#### 3.1 Introduction

The previous chapter (Chapter Two) reviewed models that explain the design of information management systems (IMS). A conceptual framework was defined and interpreted in the context of a SIMS for higher education. It is evident that the information environment is an important component of the design of information management systems. To design a coordinated SIMS for higher education in Uganda, it is important to establish the state of the information environment in Uganda, which is the purpose of this chapter. The implications for the education system are discussed. This chapter also describes the socio-economic status of the country and examines development efforts in information management since independence. The extent to which international organisations' programmes influence information management strategies in Uganda is examined. Policies regarding information management in the country are analysed to provide a framework for designing an IMS in Uganda.

#### 3.2 The Socio-economic profile of Uganda

Uganda is located in the heart of sub-Saharan Africa, and lies astride the Equator. It is a landlocked country in East Africa, bordered by Kenya in the east, Rwanda in the south west, Tanzania in the south, Sudan in the north and the Democratic Republic of Congo in the west (*Uganda Pocket Facts* 1999:1). According to the constitution of Uganda, the official language is English (Uganda 1995<sub>a</sub>: Chap. 2, Article 6(1)). According to the *Government White Paper on the Report of the Commission of Inquiry (Constitutional) Review*, however, the Government has recently approved Swahili as a second official language (Uganda 2004<sub>a</sub>: Chapter 18(3)). This language may be used as a medium of instruction in schools or other educational institutions or for legislative, administrative or judicial purposes (Uganda 1995<sub>a</sub>: Chap. 2, Article 6(2)). It occupies a total area of 241,000 square kilometres, of which about 44,000 square kilometres are covered by bodies of fresh water (Uganda National Commission for UNESCO 2001:89). The results of the population census in 2002 indicated the population of the country to be 24.7 million people [as per the 12<sup>th</sup>/13<sup>th</sup> September, 2002], with a population growth rate of 3.4% (Uganda Bureau of Statistics 2003). Out of the current population of

24.7 million Ugandans, 12.6 million are female and 12.1 million are male. Only 12% of the population live in urban areas and the rest (88%) live in rural areas. The population density is estimated at 126 persons per square kilometre (km<sup>2</sup>). The estimates of the Uganda Bureau of Statistics (2001:v) show that the life expectancy is 48.1 years and shows the literacy level to be 62%.

According to the *African Development Report* of 2002, Africa's real Gross Domestic Product (GDP) in 2001 was estimated at 3.4% (The African Development Bank 2002:1). The East African region recorded the highest economic growth of 4.6% compared to other African regions. Despite a decrease from 5.5% in 2000 to 4.8% in 2001, Uganda still registered a high real GDP growth rate in East Africa, compared to Kenya at 1% and Tanzania at 4.6% (Uganda. Ministry of Finance, Planning and Economic Development 2002:iii). It is a national aspiration to attain high and sustainable growth in a competitive environment.

The basis for Uganda's future economic growth and development is clearly stated in its *Vision 2025*, which provides the key areas of focus in modernising the economy, among other strategies (Uganda. Ministry of Finance, Planning and Economic Development 1999<sub>a</sub>:5). *Vision 2025* sets out the course of action and benchmarks for the socio-economic developments to be achieved by the year 2025 (Uganda. Ministry of Finance, Planning and Economic Development 1999<sub>a</sub>:1). It also provides key considerations for sustainable economic growth and development, including: the private sector, human resource development, the operational environment (including decentralisation), information systems, science and technology, infrastructure, and education (Uganda. Ministry of Finance, Planning and Economic Development 1999<sub>a</sub>:9-31).

Education has been given special attention since the introduction of Universal Primary Education (UPE) in 1996, which is seen as a key tool to achieve social progress (Uganda. Ministry of Finance, Planning and Economic Development 2001:116). With the introduction of UPE (1996), the enrolment in primary schools shot up from 2.7 million pupils in that year to 5.3 million in 1997, and to 6.59 million in 1999 but later dropped to 6.56 million in 2000 (Uganda. Ministry of Education and Sports. Educational Planning Department 2001:4). The recent education statistics show 14,420 primary schools with a population of 7.354 million. Table 4.1 in Chapter Four provides details about the current state of enrolment in the education sector in Uganda. These increasing numbers have necessitated greater government expenditure in this sector. A sectoral comparison of public expenditure shows that the education sector ranked highest, with 26.0% in 1997/98, 26.9% in

1998/99 and 26.2% in 1999 (Uganda. Ministry of Finance, Planning and Economic Development 2001: 9). However, a functional analysis of government expenditure for the financial year 2001/02 shows a proportional decrease in the spending on the education sector from 11.6% for 2000/01 to 8.0 % for 2001/2002. This decrease is explained by the fact that the government funding also targets services that support education, including infrastructure, the communication and the information sector.

The education sector is a major component of the Government of Uganda, comprising 31% of the discretionary recurrent budget and 27% of the total national budget (Uganda. Ministry of Finance, Planning and Economic Development 2000<sub>a</sub>:14). However, it faces two central challenges: how to keep an increased number of children in the schools, and how to ensure that quality education is maintained and improved, given the expansion in the sector. The quality of education is reflected in its ability to apply sectoral information for achieving its development strategies in the country (Uganda. Ministry of Finance, Planning and Economic Development 1999<sub>b</sub>:133). In fact, the Government of Uganda in its background to the *Strategic Framework for National Development of the Vision 2025* (Uganda. Ministry of Finance, Planning and Economic Development 1999<sub>a</sub>:14-15), recommends an enabling environment that will foster the development of information and communication in various sectors of the economy.

Improvements have been registered in the information and communication sector as a result of the liberalisation and privatisation of the economy. This has affected investment in the socio-economic sector in Uganda (Uganda National Council for Science and Technology 2001: 4). For example, the statistics for 2000 to 2002 show that the number of fixed telephone lines increased from 58 261 in 2000 to 59 472 in 2002, while the number of cellular telephones increased from 72 602 in 2000 to 505 627 in 2002 (Uganda Bureau of Statistics 2003:5). The statistics in 2001 showed that there were 5 304 Internet service subscribers (Uganda Bureau of Statistics 2001:91).

It is the aspiration of the Government of Uganda in its *Vision 2025* ‘to have effective, countrywide and affordable communications infrastructure (Uganda. Ministry of Finance, Planning and Economic Development 1999<sub>a</sub>:41). To address the issues of socio-economic sustainability in the country, the Government of Uganda has put in place a Poverty Eradication Action Plan (PEAP) (Uganda. Ministry of Finance, Planning and Economic Development 2000<sub>b</sub>:iv). It is hoped that this plan will reduce poverty to 10% or less by the year 2017. The strategies include:



- Creating a framework for economic growth and transformation
- Ensuring good governance and security
- Directly increasing the ability of the poor to raise their income and
- Increasing the quality of life of the poor.

These strategies focus on enhancing the private sector, including the aspects of communication, education, decentralisation and human resource development (World Bank. African Region 2002). To meet PEAP objectives, it is important to establish the history of information management in Uganda as discussed in the next section so as to establish the gap.

### **3.3 The State of the Information Sector since Independence (1962-2002)**

Information management has been addressed in the objectives and plans of the Government of Uganda since independence in 1962. The positive contribution of information management was initially recognised by the Government when it formulated *its First Five-Year Development Plan, 1961/62 – 1965/66* (Uganda. Ministry of Planning and Economic Development 1961:47), which emphasised education and information services as the priority areas of development and focused on the long-term aim of the government's educational policy: to develop educational facilities to give every child, regardless of the social or economic circumstances of the parents, an opportunity to contribute to the wellbeing of the society. The plan also aimed at providing to the public an accurate and up-to-date service, including information, to be able to support the government objectives and foster co-operation.

An evaluation of this plan highlighted the high illiteracy levels and low levels of technical skills in the country. This formed the basis for the *Second Five-Year Plan*, which made it clear that education was a priority (Uganda. Ministry of Planning and Economic Development 1966:7). This plan was motivated by the adoption of Uganda's constitution in 1967, which revised the 1962 one and contained a provision for fundamental human rights, including freedom of expression and protection of such rights (Uganda 1967: Article 17(1)). The plan also recognised the development of information services to enable the flow of information to, from and about all parts of the country. It was the plan of the government to set up a national news agency and information offices in all districts (Uganda. Ministry of Planning and Economic Development 1966:126). This project was estimated to cost about 5 million Uganda Shillings for the period between 1966/67 to 1970/71. The

plan also proposed to provide tele-printing equipment, with a radio teleprinter network linking Kampala and other towns in the country (Uganda. Ministry of Planning and Economic Development 1966:180). This plan noted the close relationship of the use of postal and telecommunication services to the general level of education. It was in this period that the Government of Uganda acquired on a rental basis, the first electronic computer from the International Business Machine Corporation — an IBM System 370 Mainframe. The aim of renting the computer was:

- To provide facilities for the rapid production of data required in the day-to-day operations of government and other bodies.
- To provide information, on request, for particular management decisions by government and other organisations. (Uganda. Ministry of Planning and Economic Development 1966:36.)

The cost of the computer centre project was about 2.7 million Uganda Shillings for the 1966/67 – 1970/71 period. Fifty percent of the computer time was to cater for the management of the government payroll, while the remaining 50% was to be jointly shared and utilised by the Ministry of Education, Makerere University College and the University of East Africa. Parastatals, like the Uganda Electricity Board, and other private and semi-autonomous organisations, made full use of the centre (Ssemugo 2002:27). The 1969 population census also utilised the equipment of the centre in processing the data. Currently, the centre is also responsible for the preparation of the government payroll for all civil servants in Uganda.

In 1971, the development efforts of government were directed by the *Third Five-Year Development Plan 1971/72 – 1975/76* (Uganda. Ministry of Planning and Economic Development 1971:2), which aimed at benefiting all the people of Uganda. The focus of the plan was to improve broadcasting services in the country with specific attention to radio, television and the print media. It was the intention of government to improve country-wide news coverage, and the display and propagation of its information.

In 1976, the government carried out an assessment of the overall economic and social development from 1966 – 1975 (Uganda. Ministry of Planning and Economic Development 1976:1-5). It was found that the Uganda News Agency programme had not been completed and that the development of an information infrastructure still had a long way to go. A need for rehabilitation of the existing information facilities and a general deterioration of their condition were noted. The strategies of the

economic rehabilitation plan of 1976/77 - 1979/80 addressed these gaps as follows:

- Completion of a medium wave radio transmitter expansion at a total cost of sh.11.5 million;
- Two 10-kilowatt medium wave transmitters at sh.4.5 million each in Kampala and a medium wave transmitter at Mbale, together with the replacement of TV transmitters;
- Implementing the initial stage of the Uganda News Agency;
- Installing the tele-printer to link equipment at 6 provincial headquarters;
- The rehabilitation of the Voice of Uganda (Radio Uganda).

These strategies were never completed as expected because of the 1978/79 war that caused disruption to most of the economic activities in Uganda.

In 1981, the government of Uganda introduced monetary and fiscal reforms that gave rise to new economic policies by developing the recovery programme for 1982 - 84 (Uganda. Ministry of Planning and Economic Development 1983:1). The strategy of the ruling party at that time — the Uganda Peoples Congress (UPC) — was to ensure effective control of public expenditure. This, however, resulted in the decline of its support for the social infrastructure. For example, the total planned expenditure on social infrastructure in 1982/83 was \$42.5 million and the actual expenditure came to \$21.72 million, making up 51% of the planned expenditure. This decline was attributed to lack of funds, inadequate project management skills and administrative problems. These also affected the information sector in the country.

When the National Resistance Movement (NRM) took power in 1986, it emphasised social infrastructure (including education and information) in its plan, which it called the *Uganda economic policy package*. The economic policy package aimed at rehabilitation of TV services, among other priorities. This strategy aimed at providing quality and functional level services for the information sector, depending on the availability of funds. This was later implemented with the assistance received from West Germany, UNICEF and the 2<sup>nd</sup> IDA reconstruction programme (Uganda. Ministry of Planning and Economic Development 1988: 377). With the breakdown of the data processing equipment during the turbulent days of Idi Amin, the department resorted to semi-manual systems.

The development plan of 1987/88 to 1988/89 provided for improving the government expenditure in

the social sector, making the decision to purchase four computers and a good range of peripherals and software, and the setting up of a population census computer with ten data entry terminals (Uganda. Ministry of Planning and Economic Development 1989: 11). Owing to technological advances, the Government realised that computers are essential in everyday life and notably in communication systems (Uganda. Ministry of Planning and Economic Development 1988: 347). However, the economy lacked manpower as it was noted that Uganda's students left school without sufficient basic knowledge of computers. The government thus suggested the introduction of computer courses in schools and colleges (Uganda. Ministry of Planning and Economic Development 1988:347). To develop capacity in computers and communication systems, a project that cost a total of US\$200,000 was set up to advise the government on the most adequate, relevant and effective methods of introducing computer literacy into the education system in Uganda. With the assistance of the British Council, two computers were provided to the Institute of Teacher Education, Kyambogo (ITEK) for integrating a computer literacy programme into the curriculum. Mulira (as referred to by Ssempogo (2002:27)) describes the period from the 1990s to date as having been characterised by an exponential growth in computer applications, usage skills, and appreciation in the country.

In an effort to ensure the development of the flow of Government information in the country, the Government of Uganda financed a project for the development of a National Information System (NIS) during the 1989/90 and 1990/91 financial years (Uganda. Ministry of Finance, Planning and Economic Development 1993:247). The project was initially funded by UNESCO and later jointly sponsored by the International Development Research Council (IDRC) and the Government with assistance from United Nations Development Programme (UNDP). It aimed at developing a coordinated network of information sources, systems and services in Uganda for planning, problem solving, decision making, research, and technological transfer activities in the priority areas of socio-economic development. This strategy was to be achieved through strengthening the existing library, documentation and information infrastructure. In 1992, a bill to establish the NIS by an Act of Parliament had already been completed by the Solicitor General, pending presentation to the National Resistance Council (Parliament) by the Minister of Public Service for it to be debated. However, the bill has never been presented nor has the progress report on the committee ever been tabled (Mugasha 2000:89). This could have been the turning point in the development of a national information system. Establishing such a system would have facilitated information management in the country.

Since 1992, efforts have been undertaken by the government to improve on the information infrastructure in the organisation of registries (to ensure easy file and information flow in government departments) and government archives (to protect and preserve government information and records), and of capacity building programmes. For example, in 1993/94, the Ministry of Public Service started a two phase project for the rehabilitation of the registries of selected ministries and for conducting training courses in records management. The government has also been aiming at strengthening the records and information management department in the Ministry of Public Service, for the purposes of managing personnel and pension information. The project involved the renovation of the National Records Centre and ensuring the drafting of a National Records and Archives Act. A rehabilitation grant of US\$ 230 769 from the Overseas Development Agency (ODA), for shelving, training and assistance in records management, was provided for the project.

To improve information access in central government departments and those of the local governments, the Ministry of Local Government developed a records and information management manual for districts and municipal councils (Uganda. Ministry of Local Government 1999:1). This manual provides information on the management of registries, file classification and computerising of records systems. In a similar development, the Ministry of Public Service has continuously updated its basic registry manual (Uganda. Ministry of Public Service 2000: 1-28). The manual's focus is on the protection of government information, and standardisation of procedures in government ministries. With the help of the capacity building project in the Ministry of Finance, Planning and Economic Development, records staff have been trained for performance improvement in order to meet government goals.

Reflecting on the national information system (NIS) strategy that did not materialise, UNESCO, through the Department of Information in the Office of the President, conducted a study on the development of a National Communication Information Policy (Uganda. President's Office. Department of Information 1999: 37-39). This study reflects on the development priorities that included basic education, health care, and modernisation of agriculture, good governance, and the policy of decentralisation. Using the study, the Department of Information drafted the Communication and Information for Development White Paper (Uganda. President's Office. Department of Information 1999: 4-5), which was guided by the Constitution of the Republic of Uganda, specifically by Article 29 (right to freedom of expression) and Article 41 (right of access to

information). It also drew on the human rights principles outlined in the *Universal Declaration of Human Rights* (1948) (UNESCO 1994:4-14). The major objective of the White Paper was to ensure the provision of information for development in the country. It sets out the following principles:

- To develop/stimulate the awareness of national identity in pursuit of social-economic, political and cultural goals.
- To be human rights based and guarantee freedom of expression and of information.
- To increase peoples' means of accessing communication and information.
- To ensure that the whole population benefits from communication technology.
- To reflect high standards of moral and ethical integrity. (Uganda. President's Office. Department of Information 1999:12.)

The White Paper provisions include the right of access to information. It also provides a basis for the development of the communication and broadcasting services in the country. The decentralisation strategies provided in the implementation structures are fundamental to the development of an information system in the country. The white paper has also formed a basis for the information and communication infrastructure in the country, as will be discussed later in this section.

Highlights of the progress in the development of the information sector include an attempt by the government to mobilise and involve the local communities in the planning, implementation and maintenance of information management strategies. In terms of quality, the government has consistently increased its funding and support to the information and communication sector. For example, following the liberalisation process, in 1994, the Government of Uganda drafted the National Science and Technology Policy. Some of the results of the policy include the enactment of the Uganda Communication Act in 1997 (Uganda 1997<sub>b</sub>). The Act established an independent regulatory body, the Uganda Communications Commission (Communities and Information Society for Africa 1997:5). The Act also provided for the incorporation of Uganda Telecom Limited (UTL) and Uganda Post Limited (UPL). One of the aspects that received attention was the development of the information and communication sector. One important benefit of the liberalisation of the telecommunication services is that it has enabled private sector companies to provide mobile cellular phone networks and paging services that facilitate information transfer in the country. At the moment, the major information and communication technology (ICT) infrastructure providers are Uganda Telecom (UTL), Mobile Telephone Networks (MTN) Uganda and Celtel Uganda (Uganda National Council for Science and Technology 2000<sub>a</sub>: 6). This has added a new dimension to the

importance of science and technology in national development. For instance, the GDP in the communication sector, at factor cost, at current prices (million shillings) from 1994-1999 is as presented in the following table:

**Table 3.1: GDP (at factor cost at current prices: Calendar years 1994-1999) of the Communication sub-sector in Uganda (Million Shillings)**

Sectors	1994	1995	1996	1997	1998	1999
Communication	15,730	18,013	21,764	24,897	27,058	33,406
...	...	...	...	...	...	...

*Source: Uganda. Ministry of Finance, Planning and Economic Development 2000<sub>a</sub>.*

In an attempt to develop, promote and integrate science and technology (S&T) in the national development process, the Uganda National Council for Science and Technology (2001: 1) carried out an assessment of the technological capacity of different sectors of development. The data obtained showed that Uganda's technological capacity was still low (Uganda National Council for Science and Technology 2001: 6). With the support from International Development Research Centre (IDRC), UNESCO and United Nations Economic Commission for Africa (UNECA), Uganda National Council for Science and Technology (2000<sub>b</sub>: 4) organised a national stakeholders' workshop from 28 – 29 September 2000 to discuss a proposal document that provided an institutional framework for the development and application of the ICT policy. The Uganda National Council for Science and Technology (UNCST) has continuously held consultative meetings with stakeholders regarding the national information and communication policy framework. Observations in the consultative meetings and workshops organised by UNCST showed an absence of the policy pronounced by the government to govern information and communication technologies, and yet there are many reasons why there is a need for one. The UNCST has observed a critical need for a legal and regulatory framework that would ensure a coordinated and regulated approach to overall development of ICT in the country. A framework that can guide and direct investment in ICT in the country is desirable (Uganda National Council for Science and Technology 2001: 9).

Taking up the existing challenges and opportunities that had demonstrated a need for proactive policies regarding technological capacity, Uganda National Council for Science and Technology (2002:6) developed a National Information and Communication Technology Policy Framework. The vision of the policy is to have a 'Uganda where the national development is sustainably enhanced, promoted and accelerated by efficient application and use of ICT, including timely access to

information' (Uganda National Council for Science and Technology 2002:36). The aim of this draft policy is to promote the development and effective utilisation of ICT in Uganda. Objective 7 of the draft policy provides for the facilitation of access to information in the public domain. To achieve this objective, the draft policy specifies certain strategies that include the:

- Establishment of appropriate mechanisms and structures through which various government ministries and departments will provide information at the lowest possible cost and with the fewest restrictions possible in order to maximise access to and use by all citizens.
- Codification of the right to universal access, by all Ugandans, to public domain information, without compromising individual or national security (Uganda National Council for Science and Technology 2002:40).

The policy recommends that the National ICT Coordinating Agency be in charge of the coordination and implementation of the ICT development objectives in the country (Uganda National Council for Science and Technology 2002:45). Generally, the policy provides an institutional framework for the management and coordination of information in Uganda. The structure for this policy provides a conducive environment for the designing of an information management system here. However, this requires a strategy to ensure standards and identification of the content to be coordinated and to provide for a strategy to be integrated into the environment for which it is intended.

From the discussions above, it is clear that the government of Uganda has endeavoured to include information and communication in its development plans. However, most of the plans have been developed with donor support, based on the international and global trends of the day. The next section explores various strategies that could have an influence on the development of information systems in Uganda.



### **3.4. Global Influence on Information Environment in Uganda**

For economic reasons (Economic Commission for Africa 1999:7), many developing countries have included information and communications programmes based on global development strategies into their development programmes. In some of these strategies, which have had an impact on Uganda in terms of information management include the Millennium Development Goals, the African Information Society Initiative, and the New Partnership for Africa's Development (NEPAD).

#### **3.4.1 Millennium Development Goals**

The government has worked towards the achievement of the UN's millennium development goals that were adopted in September 2000 (Makubuya 2002). Uganda has embraced these goals, pledging to provide education for all. For example, the World Bank has provided support for an Education Adjustment Credit and Grant in Uganda, the outputs of which include an Educational Management Information System (EMIS) in Uganda. This pledge by the government, however, offers challenges for building an information system in the country, to enable sharing of information at all levels in the education system.

#### **3.4.2 The Information Society Initiative in Uganda**

Different initiatives promote the use of information in societies. Two such initiatives are the African Information Society Initiative, and the World Summit on Information Society.

The African Information Society Initiative (AISI) is a pledge by African countries to advocate the creation of National Information and Communication Infrastructure (NICI) plans (Economic Commission for Africa 1999:26) in their development strategies. The initiative aims at:

- fostering the growth of technology in the economies of Africa,
- promoting access to information and communication technologies that are crucial for effective participation,
- focusing on their education policies, promotion of science and technology,
- upgrading national technological capabilities by establishing information-intensive institutions that can provide necessary assistance (Economic Commission for Africa 1999:26-29).

The International Development Research Centre (IDRC) has spearheaded this initiative and launched the Communities and Information Society in Africa (ACACIA) programme targeting African economies (including Uganda). The ACACIA programme supports the community (village,

school, trading centre) in setting up information and communication tele-centres and kiosks. For example, IDRC has supported the initiatives of UNESCO for the establishment of Multipurpose Community Tele-centres (MCT). The MCT pilot project in Uganda, located in a rural village, Nakaseke in Luwero District, aims at stimulating rural development by facilitating access to and generation of information, learning and communicating. UNESCO and IDRC have also supported other community tele-centres in Apac, Kagadi, Nabweru, Buwama, and Kachwekano (Nakkazi 2003:2). This is to enable local capacity development in the community, to use modern information and communication technologies in their daily activities (UNESCO 1999:24).

To enhance the utilisation of ICT, emphasis has been put on literacy campaigns, civic awareness, and interactive ICT. However, it is the aim of the ACACIA initiative:

*To build a body of knowledge and evidence identifying the policies, technologies, approaches and methodologies most instrumental to promoting affordable and effective use of ICTs by poor, disadvantaged communities* (International Development Research Centre 1997:16).

The initiative singles out four strategies for Uganda: the setting in place of policy, human resources, technology and infrastructure, and content development (International Development Research Centre 1997:6). All these require a strategy to identify information in the country.

In fact, the position of UNESCO in the World Summit on the Information Society (WSIS) is based on the theme ‘from the information society to [the] knowledge society’ (UNESCO [S.a]:2). The four principles that UNESCO states as essential for development are cultural diversity, equal access to education, universal access to information, and freedom of expression. One of the objectives of WSIS is to reach agreement on a united global vision of the nature of society and on harmonious procedures for its establishment (Uganda 2003<sub>a</sub>:2). The government of Uganda’s response to the UNESCO paper noted that there is a need for an integration of and overlap among the different areas of concern (structural, technological, cultural, economic, social and gender) in the development of an information society (Uganda 2003<sub>a</sub>:2). This calls for a need for standardisation of content, to facilitate proper coordination of information in the country.

### **3.4.3 New Partnership for Africa's Development (NEPAD) Initiative**

New Partnership for Africa's Development (NEPAD) is a pledge by African leaders based on a common vision and a firm and shared conviction that they have a pressing duty to eradicate poverty and to place their countries on a sustainable path to growth and development (New Partnership for Africa's Development 2001:1).

To support the objectives of the African Information Society Initiative (AISI), UNESCO in collaboration with United Nations Economic Commission for Africa (UNECA), United Nations Development Programme (UNDP), and International Telecommunications Union (ITU) has included New Partnership for Africa's Development (2001:2-10) on its agenda. This is in line with UNESCO's mission 'to promote free access to information as a means of sharing knowledge for effective participation in society' (UNESCO 2002: 22). In its Information Programme for All, UNESCO aims at building an information society for all. UNESCO (2001: 1-6) has therefore set up five priority areas:

- Development of international, regional and national information policies
- Developing human resources capacity and capabilities for the information age
- Strengthening institutions as gateways for information access
- Developing information processing and management tools and systems
- Information technology for education, science, culture and communication

The main focus of the African UNESCO Agenda falls upon science and technology for the sustainable development of Africa. The UNESCO (2002:47) initiative recommends that governments spread information about NEPAD and provides the following strategies:

- African countries should give priority to building capacities in innovation management and the management of technology transfer.
- UNESCO should develop an assistance programme for African scientists in the field of ICT — including a programme on awareness raising and retraining of scientists in ICT.
- UNESCO should develop an intersectional framework for ICT — a policy for the use of ICT in education, science and culture in co-operation with the United Nations Economic Commission for Africa (UNECA) and other United Nations agencies. (UNESCO. African Region 2002: 4-26.)

The Uganda National Commission for UNESCO (2001:60) is responsible for promoting the developments of S&T and educational programmes in Uganda. It links UNESCO activities to appropriate institutions and ensures appropriate action (UNESCO 1999:14). To achieve the national long-term perspective of Uganda's *Vision 2025*, UNESCO has formulated a strategy (the Horizon) for 2020. This strategy, that is intended to promote use of science and technology, aims at utilising information for the promotion of lifelong education for all in Uganda (UNESCO 1999: 6). The strategies of the Horizon for Uganda include:

- The enhancement of the management and administration of education at national, district, and institutional levels.
- Ensuring countrywide dissemination and utilisation of information technology.
- Promoting development of effective administrative methods for data collection to supplement the census and surveys.
- Promoting the establishment and management of a national statistical database and develop a national records and documentation centre.
- Developing the utilisation of information technology more intensively, for the purposes of collection and dissemination nationally.
- Enhancing the sharing and exchange of information within and outside Uganda.
- Developing modern systems of regular updating, management and disseminating of technical information. (UNESCO 1999: 1-12.)

Access to information and the use and sharing of it are important factors in the development of information systems. The available opportunities offered by NEPAD, the Information Society Initiatives, and the millennium development goals all emphasise the need for coordinating of information for effective delivery, which is why a strategy to coordinate information in Uganda is important.

#### **3.4.4 International Standards and Agreements**

Few universal standards have been set for the promotion, use and development of the information sector. For example the Universal Declaration of Human Rights (UDHR) regarding the freedom of information, Article 1, paragraph 2(a) of the UNESCO Constitution, stipulates that:

*Organisations will collaborate in the work of advancing the mutual knowledge and understanding of peoples through all means ...to promote the free flow of ideas by word and image (UNESCO 1994:117).*

The declaration stipulates various conventions that affect the freedom of information, which started with a convention adopted in 1958 concerning the exchange of official publications and government documents between states. In 1972, the UNESCO declaration of guiding principles on the use of satellite broadcasting for the free flow of information, the spread of education and cultural exchange,

followed. Thus, Article 19 of the UDHR states ‘Everybody has the right to freedom of opinion and expression’ (Universal Declaration of Human Rights 2003). This right among other effects includes the freedom to hold an opinion without interference; and to seek, receive and impart information or ideas through any media and regardless of only frontier.

At the regional level, the countries of Kenya, Tanzania and Uganda revived the East African Community (1997:iii), which aims at achieving a people-centred, market-driven and private sector-led development. The East African Community Treaty, Article 102 (h) (2002), fosters co-operation in the exchange of information regarding educational systems and Article 103 identifies science and technology as priority areas for regional co-operation. It is the aim of the community to provide a mechanism for suitable arrangements to coordinate technological and scientific information. Coordination of such information requires standards to be put in place to enable effective sharing and use of information.

It is important to note that there are various government agendas, mainly focusing on information, that require harmonisation and coordination. This requires a strategy to address the needs and requirements of the environment for which they are intended. It is important to explore the available policy and institutional frameworks of a country to establish the existing provisions for coordination of information there.

### **3.5 Policies and Institutional Framework for information management in Uganda**

The policies and regulations affecting the development of information management systems and strategies are discussed below:

#### **3.5.1 The Right of Access to Information**

The Constitution of the Republic of Uganda provides for ‘the right of access to information in the possession of the state or any other organ or agency of the state except where the release of information is likely to prejudice the security or sovereignty of the state or interfere with the right to privacy of any other persons’ (Uganda 1995<sub>a</sub>:Article 41(1)). Section (2) of the same Article provides for the parliament to make laws prescribing the classes of information referred to in Clause (1) of the

same Article, and lays down the procedure for obtaining access to that information. These provisions reflect the principles underlined in the Universal Declaration of Human Rights (UDHR) (1948) (UNESCO 1994:5-14), that countries should promote the free flow of ideas by word and image. However, Article 9(1) of the Public Service Act and Article 22 (12) of the Education Service Act, 2002, Act 6, No. 4, criminalise the disclosure of information by public servants (Uganda 2002<sub>a</sub>). For example, the Public Service Act specifies that:

*It is an offence for any member or officer of the commission and any other person to knowingly publish or disclose the contents of any document, communication or information whatsoever that has come to his notice in the course of his duties in relation to the commission without the written permission of the Minister (Uganda 1969, Chapter 277, Article 9).*

Those provisions enforce the public service standing orders that on assumption of office, every civil servant subscribes to an oath of secrecy that he will not directly or indirectly communicate or reveal any matter to any person, which shall be brought under consideration or shall come to his knowledge in the discharge of his official duties. The only exception occurs when such a communication or revelation is necessary for the discharge of his/her official duties or where the president has specifically directed it (Uganda 1991<sub>a</sub>, Article 19).

Furthermore, the fourth schedule of the Constitution on the Oath of the Minister states:

*I being appointed a minister of Uganda swear in the name of almighty God, solemnly affirm that I will at all times well and truly serve the Republic of Uganda in the office of a minister; and that I will support and uphold the constitution...and that I will not directly or indirectly reveal any matter as shall come to my knowledge in discharge of my duties and committed to my secrecy. [So help me God] (Uganda 1995<sub>a</sub>, Forth Schedule).*

In fact, the Leadership Code Act, 2002, article 14 (1), prohibits the misuse of official information. It states:

*... a leader shall not directly or indirectly use or allow any person under his or her control to use for furthering any private interest, whether financial or otherwise, any information obtained through or in connection with the office of the leader and not yet made available to the public (Uganda 2002<sub>b</sub>, Article 14(1)).*

Furthermore, the Inspectorate of Government Act, 2002 Act 5, Acts Supplement no. 4, in line with Chapter Thirteen of the Constitution and in particular as required by Article 225, 226, 232 of the Constitution, provides the inspectorate with powers to enforce the Leadership Code of Conduct.

Article 23 of the same Act empowers the inspectorate to disseminate information on the evil and dangerous effects of corruption on society, and the Act proclaims that information in its possession is privileged. It states:

*Subject to any law which enjoys the disclosure of classified information, anything said, information supplied, document, paper or thing produced in the course of inquiry under this act shall be privileged in the same manner as if the inquiry were a proceeding of court of law, and a report of the inspectorate shall be privileged in the same manner as if it were a record and judgement of a proceeding in court (Uganda 2002<sub>c</sub>, Article 23).*

Subject to this act, the Inspectorate may:

*Summon any person who in the opinion of the inspectorate is able to give information... and to furnish and produce any documents, papers or things that may be in possession or under the control of that person (Uganda 2002<sub>c</sub>, Article 26(1) (a)).*

To address the code of conduct regarding the access to and provision of information, the Press and Journalist Statute (Uganda 1995<sub>b</sub>) was passed to provide for the freedom of the press. The statute also provides for a council for the regulation of the mass media and establishes the Institute of Journalists. The statute repeals the Newspaper and Publications Act, and the Press and Censorship Act. Article 5 of the statute provides that ‘a person may have access to official information subject to the provisions of any law in force relating to national security, secrecy or confidentiality of information’. Article 10 of the same Act establishes a council to regulate the conduct of and promote good ethical standards and discipline amongst journalists, and promote generally the flow of information (Uganda 1995<sub>b</sub>, Article 10).

According to the Uganda Gazette, the Access to Information Act, 2005 has been passed by the Parliament of Uganda (2005<sub>a</sub>) [however, at the time of completing this thesis, the Act had not yet been published]. This Act is a result of the Access to Information Bill, 2004. According to the Bill, the object of the Act is to prescribe, in accordance with clause (2) of article 41 of the constitution, the procedures for obtaining information (Uganda 2004<sub>c</sub>). The procedures for access to information and records specify the use of a manual of functions, an index of the records of any public body, the need for a directory of information, and the duties of information officers. The Act is intended to promote freedom and security of access to information. The provisions of the Act regarding the

manual, index and directory, and protection of records are fundamental when designing an information management system for a country like Uganda. Providing a strategy for the identification of information to be accessed should ensure easy coordination of information in the country. The right of access to information lays a foundation for the design of any such system in the country. In addition, protection of information is a clear indicator (parameter) of an effective information system.

### **3.5.2 Standardisation of Information Systems**

The Uganda National Bureau of Standards (UNBS) is empowered to formulate national standards, promote standardisation and develop control systems for consumer protection, public health and safety, industrial and commercial development and assurance on technological standards and quality (Uganda 1983<sub>b</sub>). Article 2 (1) of the Uganda National Bureau of Standards Act 1983 provides the Bureau with a mandate to ‘encourage or undertake education work in connection with standards’ (Uganda 1983<sub>b</sub>:4-5). In executing its mandate under the statute, the bureau generates, collects, and holds information that is of public interest. Section 40 of the Act provides a blanket prohibition against the disclosure of secret information, yet it does not indicate the kind of information that should be regarded as secret under the statute. The statute is enhanced by Articles 13 and 36 of the Local Government (Amendment) Act 2001, that provide for the establishment of minimum national standards of service delivery in the sectors under local government jurisdiction. The Local Government Act empowers the UNBS to compile and disseminate information about national standards as they apply to local governments (Uganda 2001<sub>c</sub>, Article 13).

More specific to education, the Education Standards Agency (Uganda. Ministry of Education and Sports 2000:77), is a custodian of educational standards in the ministry. The agency is mandated to monitor, inspect, supervise and advise on teaching and professional matters. It investigates and prepares instructional and inspection instruments and guidelines, etc. Its mission is to provide a national system of setting and defining standards and quality in education and sport, and to monitor achievements. It liaises with the Uganda National Examinations Board (UNEB), National Curriculum Development Centre (NCDC), Uganda National Council for Science and Technology (UNCST), and Uganda National Council for Higher Education (NCHE), which have specific responsibilities for setting standards and ensuring quality (Uganda. Ministry of Education and Sports 2000:77).



To enhance integration of lifelong learning, the Government of Uganda enacted the Education Service Act, 2002. The Act establishes an Education Service Commission, the functions of which, among others, are:

- To review the terms and conditions of service, standing orders, training and qualifications of public servants and matters connected to their management and welfare and make recommendations to government.
- To establish and maintain a record of all public servants in the education service. (Uganda 2002<sub>a</sub>, Article 8(c).)

Maintaining a register of records of public servants in the education sector is a positive strategy towards creating an information management system as is setting standards. Hence, the identification of information for which standards are laid down is crucial in the development process.

### **3.5.3 National Statistical Information System**

In 1998, the Government of Uganda through the Ministry of Finance, Planning and Economic Development established the Uganda Bureau of Statistics (UBOS) (Uganda 1998). The Bureau, formerly the Department of Statistics in the Ministry of Finance, Planning and Economic Development, is responsible for the collection of data in and compiling the main statistics concerning the economy. The UBOS is mandated to coordinate, monitor and supervise the entire statistics system comprising data from government ministries (Uganda 1998, Article 4(2)). The Bureau conducts censuses and surveys that provide economic, social, and demographic statistics. It has conducted six scientific population censuses: the pre independence censuses of 1948 and 1959 and the other four national post independence population and housing censuses were conducted in 1969, 1980, 1991 and 2002 (Uganda Bureau of Statistics 2002). The Bureau also conducted the 1992 Integrated Household Survey (IHS) and the 1995, 1997 and 2000 Demographic and Health Surveys (DHS). In addition, the bureau also undertakes regular collection of data on industrial production, consumer prices and external trade (Uganda Bureau of Statistics 2001:I). The Bureau is assisted by various agencies, as presented in the table below, in conducting and compiling statistics in the country.

**Table 3.2: Type of statistics kept by various agencies**

<b>Agency</b>	<b>Types of Statistics</b>
Uganda Bureau of Statistics	Economic indicators, demographic characteristics, statistics on persons total population growth, urbanisation, sex, fertility, motility, rural urban distribution, housing census, GDP, price index, economic analysis, annual inflation, etc.
Bank of Uganda	Monetary survey, interest rate, foreign exchange rates, values of inter-bank loans, reserves, bank assets and liabilities, interest rates, domestic credit, monetary surveys, real sector surveys, balance of payments, debt indicators, etc.
Ministry of Education & Sports	Enrolment (students, staff, facilities), performance, graduate statistics, etc.
Health	AIDS cases, mobility, outpatient per capita attendance, health facilities, immunisation rates, etc
Ministry of Agriculture, Animal Industry and Fisheries	Cash crops, food crops, procurement of main cash crops, by year and weight, food crops by area and production, livestock numbers, and fish catch by water body.
Ministry of Works, Transport and Communication	Registration and estimated number of motor vehicles, road accidents, telephone and internet subscribers, main road and railway network by district and total vehicles on the road, registered vehicles by ownership, etc.
Criminal Investigation Department (Uganda Police)	Cases reported to police, prison population by sex, remand prisoners by period, road accidents, traffic accidents by districts, etc.
Forestry Department, Ministry of Water, Land and Environment	Forest reserve area by region, annual production of wood, biomass energy, forest reserve areas by category and districts, total production of timber, value of output of round-wood timber and charcoal.
Labour	Index of industrial production, wage bill, production of manufactured commodities.
Natural Resources	Fuel sales, electricity capacity, petroleum products by type, electricity sold, etc.
Ministry of Finance and Economic Planning	Approved releases, recurrent expenditure by districts, distribution of external assistance, public external debt, payment to creditors, recurrent revenue, budgetary operations, domestic resource mobilisations

*Source: Compiled from Various Sources by E. Magara (2004).*

Other agencies that collect information include Post Uganda Ltd, Uganda Telecom Ltd, Migration Department, Uganda Tourist Board, Ministry of Public Service, Uganda Investment Authority, and Uganda Revenue Authority.

The government of Uganda aspires to have an institutional framework that operates at all levels of government (central and local) for efficient coordination of statistics in the country (Uganda. Ministry of Finance, Planning and Economic Development 1999<sub>b</sub>:143). The Ministry of Local Government has established planning units at district level for managing district databases of statistical information, including district educational statistics. In fact, computers have been provided to districts and efforts are underway to train staff to be computer literate in order to enhance the acquisition of statistics in the country (Uganda. Ministry of Education and Sports 1999<sub>a</sub>:V-4).

To coordinate statistics in the country, standards must be maintained for their capture and

storage. Properly identified data will provide reliable statistics in the country. The structures provided for the coordination of statistics at national level and in local government also create an important framework for an information management system in Uganda.

#### **3.5.4 National Records and Archives Information Systems**

The findings of the 1987 census of public servants showed that there is a lack of reliable records in the Ministry of Public Service. It was also noted that there are cases of loss of records through theft and other malpractices, common among government departments (Uganda. Ministry of Public Service 1990:144). It was discovered in 1987 that there was no management information systems manual to guide the capture, storage and retrieval of information in the Ministry of Public Service (Uganda. Ministry of Public Service 1990:144-148).

The *Public Service Reform Programme (PSRP) Annual Report* (Uganda. Ministry of Public Service 2000:15) observed that there is a need for effective management information systems to facilitate the operations of the public service and to support management decisions. The report also recommends improved physical management systems in the country. As a result, a new classification system was replicated in government ministries and departments (Uganda. Ministry of Public Service 2000: 18-20). Later, the National Records and Archives Act, 2001, Act 12, Supplement No. 10, to provide for the rationalisation of the management of all government and other public records and archives under one single authority, was enacted. The Act provides for the preservation, utilisation and disposal of such records and archives. It repeals the Records (Disposal) Act, 1963 and other connected matters. It established the National Records Agency that performs functions which include the establishment of records centres for the maintenance and provision of official access, and to preserve and make available public archives (Uganda 2001<sub>a</sub>, Article 5).

To promote the storage and protection of government records, educational institutions especially higher education are required to educate the public sector to keep adequate records, particularly administrative records, for effective documentation and reference. The policy provisions reflect the management of records in their physical format. The existence of the Records and Archives Act provides a legal foundation for any developments in the use, management and protection of information in the country.

### 3.5.5 Information Protection Systems

For any system to succeed there must be a system to control and protect its operations and the quality of data. The Patents Statute 10, 1991, amended by the Patents (Amendment) Act, 2002, provides for the protection of scientific inventions and innovations through patents and utility certificates, and sets the criteria for protection by patent. The Trademark and Service Law, and the Copyright Act of 1964, on the other hand, protect the trademarks, service marks and copyrights of individual works respectively. The amendments of 2002 aimed at using the provisions of the patents co-operation treaty signed in Washington in 1970. The administration of the patent statute is the function of the Registrar General in the department of the Ministry of Justice and Constitutional Affairs (Uganda 2002<sub>b</sub>: Article 24E:5).

To preserve the national culture and intellectual output of Ugandans, the National Library Act, 2003 establishes the National Library of Uganda to act as a repository of publications published in Uganda, by Ugandans, and on Uganda (Uganda 2003<sub>b</sub>, Article 4(m)). To enhance the protection of intellectual property rights, the Copyright and Neighbouring Rights Bill, 2004, to repeal and replace the Copyright Act, 1964, is still under scrutiny by the public to ensure effective representation and the meeting of the needs of all stakeholders [at the time of this thesis, the bill was still under discussion with the parliament]. The Bill provides for the protection of literary, scientific, and artistic intellectual works and neighbouring rights. According to the Bill, it is the duty of the right owner to indicate on the literally work, the name, title of the work, year of publication and the distinguishing mark of the producer or publisher (Uganda 2004<sub>b</sub>. Article 29). Further more, it is the duty of Registrar of the National Copyright information centre to keep evidence of ownership of the rights, identification of works and authors, and maintenance of record of rights (Uganda 2004<sub>b</sub>. Article 43). Maintenance of such rights requires a well-coordinated system in the country to keep track of required information.

The laws on copyright, trademarks and patents, and national library recognise and protect the intellectual property of Ugandans. The recognition and registration of intellectual rights is a strategy that is crucial for any information management system. The structures provided in the Acts, for example the National Library Act that coordinates community and public libraries and information centres, are instrumental in sustaining a national information system in the country. The acts set in

place a fundamental legal backing for the protection of intellectual property that forms the basis of any information system in Uganda. Hence, it is important to identify the information to be protected in any information system.

### **3.5.6 National Registration Information System**

There are a number of laws or policies in Uganda that require citizens to register at various levels to meet various requirements. Hence areas of duplication of data exist at different stages. No policy is available to coordinate these registration provisions.

Registration of citizens in Uganda, for example, can be traced from the registrations of births and deaths that date back to the colonial government, which made it compulsory for all non-Africans in Uganda to register these events. However, registration remained optional for Africans until the enactment of the Births and Deaths Registration Act No. 28 of 1970. The Act makes it mandatory for parents to register their children within three months of the date of birth or death (Uganda 1970<sub>a</sub>: Act 28, Article 6(1)). Actually, Article 18 (b) of the 1995 Constitution states that: ‘the state shall register every birth, marriage and death occurring in Uganda’. The passage of the Childrens’ Statute No. 6 of 1996:7 and the National Council for Children Statute 1996, No. 16: 3 consolidated the laws relating to children (Uganda 1996: Article 16). The statutes aim at implementing children’s rights as set out in the United Nations Convention on the rights of children and the Organisation of African Unity Charter on the Rights and Welfare of the African Child. According to Ojuko ([S.a]: 1), the Assistant Registrar General of Births and Deaths, the revitalisation of such registrations in Uganda provides legal proof of identity, nationality, age, parentage, lineage and the occupation of one’s parents. The registration guidelines are provided by Article 34 of the Constitution of the Republic of Uganda (1995<sub>a</sub>). This provision supports, amongst others, the rights of inheritance and succession. This is why Ojuko ([S.a]: 1) explains that accurate information is essential for proper planning regarding the needs of the community and educational facilities. He further notes that the nation’s vital statistics are essential for accurate planning and social development. The government has recently put in place programmes to sensitise the community to the importance of the registration of births and deaths. However, in spite of the legislation, registration of births and deaths is still erratic and an information gap exists. The registration is still voluntary.

A more comprehensive registration of adults above 18 years is done during election exercises. The Interim Electoral Commission Statute No. 5, 1995, later repealed by the Parliamentary Elections (Interim Provisions) Statute No. 4, 1996:7, established the Electoral Commission as provided by Article 61 (e) of the Constitution of the Republic of Uganda (Uganda 1997<sub>C</sub>). The commission is required to compile, maintain, revise and update the national Voters' Register (Uganda Electoral Commission 1996: 1-2). However, the report on the presidential and parliamentary elections in 1996 showed that:

*Insufficient/inconsistent information was filled on [sic] application forms for some voters ... for many of such voters it was not possible to place their particulars on voters rolls for any polling station ... some voters registered more than once ... and some voters who transferred from one voting location to another did not surrender the former identification (Uganda Electoral Commission 1996:13).*

The report showed that there was a problem with missing voters' names on some of the registers, while others could not find their names in the register on polling day. To counteract the problems experienced in the 1996 elections, the Government introduced the Photographic Voters' Register and Identification System (PVRIS) in 2001. The system aims at producing a credible and accurate voters' register in order to avoid duplicate and multiple registrations in addition to holding free and fair elections (Uganda Electoral Commission 2001:13-25). The voter particulars required at registration include information on one's surname, first name, other names, age, sex, and date of birth. The voter numbers are generated automatically by the PVRIS. The system also provides location particulars. These include district name and code, county code, electoral area name and code, sub-county name and code, parish name and code, polling station name and code and village.

The fact that PVRIS captures information concerning citizens of 18 years and above, is a tangible good step towards building an information system for the country. The facilities provided by the system are useful in coordinating voters' information. There is, however, a need to develop a strategy for coordinating voters' information with other information about voters that exists elsewhere in the country. This requires a system to identify a person before his registration for voting, to ensure proper coordination of information about each voter in the country.

The Uganda Citizenship and Immigration Control Act, 1999, Act 3, Supplement No. 3 provides for the compulsory registration of all Ugandans, and the issue of National Identification Numbers and National Identity Cards (Uganda 1999). The Act regulates the issuing of passports to citizens of

Uganda. The Act repeals the Uganda Citizenship Act 1963, the Immigration Act, 1969, the Passport Act, 1982, and the Aliens (Registration and Control) Act, 1984. Article 28 (1):21 of the same Act provides that ‘every citizen of Uganda shall be registered as a citizen by the Board and shall, upon registration, be allocated by the Board, a national identification number’. However, Article 28 (2):21 makes it the duty of every citizen of Uganda above 18 years to apply to the Board to be registered. The application form for national identification and national identity cards requests information on biographic data, family data and employment data. It captures particulars of the applicant, parents, citizenship, registration and naturalisation. The report of the Public Service Review and Reorganisation Commission 1989-90 (1989) observes that a citizen applying for a Ugandan passport does not know the rules of the game when he is applying for the passport at the front office: there is no information regarding what to do to obtain a passport in the country (Uganda. Ministry of Public Service 1990). This has left the citizen to come to know the procedures by trial and error. Similarly, travellers going outside Uganda have no information to guide them, the report observes.

The fact that the government recognises the need to issue identification to citizens is a healthy stage towards the development of a national information system. There is still a need for a strategy regarding on how the identification of such an entity can be integrated into the environment.

Other registration provisions are established by the Community Service Regulations 13 (CSI), 2001, Article 11:367 that empowers the clerk of the court to keep in a secure place an up-to-date register of offenders performing community service orders with details of such offenders, where the order is being performed, the supervising officer and any other matters incidental to the order (Uganda 2001<sub>b</sub>, Article 11). The first schedule of the Act provides a form indicating the court case number, police file number, name, sex, identity card (ID) number, date of birth, marital status, next of kin, education, religion, occupation, location, offence, particulars of offence and previous convictions (if any), among other details. A system to coordinate information of offenders with other systems that contain details of the offenders is important.

### **3.5.7 Employment Information Systems**

The public service derives its existence from the Public Service Act No. 18, 1969. The Ministry of Public Service is mandated to build and maintain an effective, efficient workforce in order to enable government to render satisfactory services to its people. The Government of Uganda, through the Ministry of Public Service (1996), put in place a National Employment Policy as per the International Labour Organisation (ILO) advisory mission that took place from 16 September to 11 October 1996. This policy is supposed to foster a productive environment of employment in Uganda. It is also intended to provide appropriate information on labour absorption in the economic sector to facilitate better planning for education and training, gender mainstreaming values, groups and working conditions. This implies that organisations must keep information about their employees.

Similarly, every employee is required to pay tax in the form of Pay As You Earn (PAYE) [a method of paying income tax where the taxpayer's employer deducts tax from the employee's wages or occupational pension before paying it to him] and any other tax as required by the government. This requires taxpayers to register with the Uganda Revenue Authority to be allocated a Tax Identification Number (TIN). A TIN is a 12-digit figure segmented into four parts with a check digit at the end. Information captured includes the name of the taxpayer, the taxpayer's file number, trading licence, location, business activity, district and town. The individual TIN requires the name of the taxpayer, postal address, birth date, employment/employer, and profession. The TIN acquired is used for all the taxes payable.

The employment sector requires a candidate to provide academic and biographic information. The information provided duplicates the already existing information in schools, higher institutions and the Uganda Examinations Board. An employee needs to obtain an identity card from the respective organisations for which he has worked. This normally contains his or her personnel number in the company. In addition to a TIN number, an employee who subscribes to the National Social Security Fund (NSSF), acquires a social security number. In fact NSSF has launched a management information system to integrate all offices in order to be able to coordinate information in the country (Olanyo 2003:14). Proper identification of the beneficiary will improve the coordination of the fund information in the country.



All the above requirements allocate a person different numbers: a birth registration number, and various numbers given in school life as one changes schools and levels. The same person acquires a payroll number (personnel number) when employed and a TIN for taxation purposes. In Uganda, all these numbers are not coordinated: no single number can identify a citizen at all stages and no strategy is in place to coordinate these efforts. However, lessons from these attempts can facilitate the design of an information management system. With the challenge of UPE, it is expected that all citizens of Uganda will receive education. This has implications for education system as will be discussed in the next section.

### **3.6 Implications of Information Management Environment to the Education Sector**

Since independence, the state of information management systems in Uganda has been facing a number of challenges. This has to some extent threatened the quality, relevance, effectiveness and efficiency in most government departments including those in education sector.

According to the government white paper on the education, it is a national goal of education ‘to contribute to the building of an integrated, self-sustaining and independent national economy’ (Uganda. Ministry of Education and Sports 1992:8), which is why the Government has set as one of its strategies the development of the ability to use data for decision making (Uganda. Ministry of Education and Sports 1992:8). This requires a development strategy to enable the effective capture, processing, storage, dissemination and use of information.

Currently, the developments in the education sector are guided by the Education Strategic Investment Plan (ESIP), which takes note of the provisions of *Vision 2025*, the Local Government Act 1997 and the Educational White Paper 1992. The plan guides the Ministry of Education and Sports (MoES) regarding the action programmes in the ministry. The plan which places an education management information system among priority areas, has an impact on the improvement of management of information in schools and the sector at large. One of the plan’s strategies is to develop frameworks, targets and plans for education institutions, for the purpose of strengthening the management of the education sector (Uganda. Ministry of Education and Sports 1998<sub>a</sub>:18).

In an effort to address the Education Strategic Investment Plan, and the national information and communication technology policy directions, a number of developments have taken place in the

education sector. For example, the National Curriculum Development Centre (NCDC) (1999:1), the statutory body charged with the development and implementation of primary, secondary and tertiary school curricula in Uganda, is implementing a curriculum based on the use of computers and the Internet, referred to as 'Curriculumnet', to supplement existing initiatives, which aims at establishing the viability and sustainability of ICTs for educational purposes. In a similar development, the Ministry of Education and Sports is also implementing a project, The Schoolnet Uganda. This aims at connecting schools in Uganda with peer schools globally (Ministry of Education and Sports 2000b:24). According to the MoES plan, a mechanism for employing computer-assisted technologies to supplement other traditional methods of teaching in schools should be put in place. The project aims at integrating computers into schools and establishing Internet connectivity in rural schools. The project also aims at improving the quality of teaching and laying a foundation for building local Ugandan content (Ministry of Education and Sports 2001:10). Other initiatives include:

- Connectivity for educator development (connect-ED), targeting Kyambogo University and Primary Teachers Colleges (PTC) teachers;
- World links, targeting a review of the curriculum;
- International Institute for Communication and Development (IICD) work flow management and financial information; and
- The global teenager programme for assisting students to learn and use ICT in schools. (Ministry of Education and Sports 2003:4.)

All these initiatives have posed challenges to the education system in Uganda. In fact, the Ministry has been criticised about the feasibility and sustainability of the use of these technologies in schools (Ministry of Education and Sports 2001:10).

Hence the Ministry of Education and Sports (2003), with support from the International Institute for Communication and Development (IICD) of the Netherlands, has proposed an ICT policy framework. The aim of the draft policy is to enable all students to have an equal and affordable opportunity of access to information and education from everywhere. In this draft policy, the Ministry proposes that all schools should have easily accessible ICTs for proper decision-making (Ministry of Education and Sports 2003:6). According to the Ministry, it is hoped that the proposed policy will guide the efficiency and effectiveness of data collection from municipalities and districts. This however requires adequate standards and the proper identification of information to be

collected and coordinated. Proper coordination of information needs a well-identified content to avoid duplication.

The development efforts in the education system connecting schools with computers require strategies to guide their implementation in schools. It is also important for the education sector to take a lead in addressing the challenges of information management in the country.

### **3.7 Observations**

The development efforts in the Ugandan information management systems have been characterised by lack of coordinated frameworks and strategies. The majority of the initiatives in the country have been dependent on foreign aid and financial assistance, the visions of which require a strategy to be integrated in Uganda. The formulation of a strategic development plan should express a clear vision, mission, goals and actions that address the country's needs and requirements. This requires a study that should be able to integrate the needs of the society into the design of an information management system in the country. Currently, there is no clear strategy available to integrate these initiatives into the national strategic goals. However, the objectives of coordination efforts put forward by national and international programmes are crucial to the development of information management systems in Uganda.

There are enormous challenges facing the existing legal and institutional framework for IMS in Uganda. It is clear that there are different sectoral policies with regard to information access, standards, identification and registration, and coordination as reviewed in Section 3.5. Although these innovations experience limitations in the integration of SIMS, their features are important in many ways. Few of these policy provisions describe strategies for access to information, standardisation of services, provision of statistics, protection of individual rights, records and archives management, and registration of citizenship information. Although there is an effort being made regarding the registration and identification of citizens in Uganda, little attempt has been made to provide a strategy for how to capture, store, disseminate and coordinate information. However, the legal and institutional frameworks available provide a background for the design of information management systems for Uganda.

At present, there is no institution operating specifically as a national centre to cater for the coordination of student information in the education sector. The Department of Educational Planning deals only with statistics about people (students and staff) and resources in educational institutions. Although there are bodies responsible for coordination of student information and enforcement of standards in the Ministry of Education and Sports (e.g. Education Standards Agency (ESA) and Uganda National Examinations Board (UNEB)), emphasis has been placed on teaching, physical infrastructure and performance assessment. Few attempts have been made regarding the coordination of student information and enabling its integration into national plans, but such a strategy is needed to enable efficient tracking of student information in the country.

### **3.8 Conclusion**

This chapter has provided some background of the socio-economic conditions in Uganda. It is clear that there has been increasing attention to education and information management in various Ugandan development plans. The chapter established that the socio-economic conditions in Uganda have favoured investment in education, information and communication services. It was clear that the majority of these developments are aimed at meeting the global expectations that lead to the definition of the country's strategic plans.

This chapter reviewed various government policy provisions concerning access, storage, protection and identification of information in the country. It is clear that the government of Uganda has put in place a number of laws that define the legal and institutional framework in the management of information. However, these policy provisions have shown much duplication of information being kept. Lack of a framework to guide the country's development strategies in the capture, storage, and use of information has contributed to inappropriate coordination of information in the country. Even though there have been efforts towards developing the information sector in Uganda, there seems to be no policy to guide the development programmes on the information management system that are being introduced in the country.

The creation of new systems poses many challenges for organisations. Prior to building a framework for any information system, it is crucial to assess the current state and identify the sector's information requirements. The current structure of the management of student information is provided in Chapter Four so as to furnish a background to the state of SIMS in Uganda that will be

discussed in Chapter Six. In order to guide a strategic development plan in the education sector, there is a need to define a strategy to coordinate sector information (including student information) in the country. However it is important to note that no country is an island in itself. Challenges, experiences, and gains in other countries that will be discussed in Chapter Five are crucial in the development of an information management system for Uganda.

## CHAPTER FOUR

### THE STRUCTURE OF THE EDUCATION SYSTEM IN UGANDA: INFORMATION CHALLENGES FOR HIGHER EDUCATION

#### 4.1 Introduction

In order to design an appropriate student information management system (SIMS), it is necessary to understand the structure in which it would function. The previous chapter examined the information environment in Uganda and discussed its implications for the education sector. The present chapter, explains the current structure of the education system, and describes major information management challenges for higher education.

#### 4.2 The Development of the Education System in Uganda

The structure of the education system in Uganda was laid down at the beginning of the 20<sup>th</sup> century as a result of a study to assess the conditions of native education in East Africa carried out by the Second African Education Commission (1925:151), under the auspices of the Phelps-Stokes Fund in co-operation with the International Education Board. The Phelps–Stokes Commission’s observations noted that all education was in the hands of Protestant and Catholic missionaries (Ssekamwa & Lugumba 2001:2). The results of this study indicated the lack of supervision of education institutions and their detachment from the communities they served (Ssekamwa & Lugumba 2001:3). The Commission thus recommended that the Government of Uganda should take responsibility for education instead of leaving it to the missionaries. Furthermore, to ensure effective supervision of the education system, the Commission recommended the setting up of a Department of Education. At that time, government businesses were managed by means of departments rather than by the current ministries. This Department was established in 1925, headed by the Director of Education and charged with the responsibilities of controlling and administering the education system in Uganda (Owacgiu 2000:5), one of the roles played by the current Ministry of Education and Sports. The Commission also recommended a new classification system for schools and their coordination within the sector. Since then, different ordinances, commissions, committees and acts in the education sector have made a significant attempt to provide guidelines for the coordination of the education system in Uganda.

To coordinate and supervise this education system, the Uganda Legislative Council passed the

Education Ordinance in 1927 (Ssekamwa 1997:194), which spelt out the powers of and procedures for management and administration in the education system in Uganda, and placed the responsibility for directing and financing education affairs on the Government. The ordinance also empowered the Director of Education, through the provincial and district boards, to register and classify all schools, ensure standards, and register teachers.

In 1937, the de La Warr Commission recommended a new classification system for schools in the country. It was also recommended that Makerere College be turned into a university college. This College had been established in 1922 by the Uganda Colonial Government. The de La Warr Commission also recommended that secondary schools should be placed at an education level or standard required to produce candidates for entering Makerere College, as an institution of higher education offering post-school certificate courses (Makerere University 1999:11).

In 1940, the Thomas Education Committee noted that missionaries still dominated the administration of the education system in Uganda. To lessen their prominence, the committee recommended the establishment of a School Boards of Governors and the involvement of local governments in financing the schools (Ssekamwa 1997:195). The committee's recommendations were made legal by the Education Ordinance in 1942, which provided for the management of the schools, including the duties of headteachers and inspection rules (Ssekamwa & Lugumba 2001:11).

In 1949, the Makerere College Act was enacted, which formed Makerere University College (Ssekamwa & Lugumba 2001:14) as a constituent college of the University of London (Makerere University 1999:11). The Act made provision for government control and administration of the college. The Binns Study Group (1951) and later the de Bunsen Education Committee (1952) recommended the establishment of secondary schools and 'practical post-primary schools'. These practical post-primary schools included farm schools, rural trade schools and home craft centres, and aimed to cater for those students who had failed to score the high marks required by academic junior secondary schools, leading to a full secondary course. The graduates of the above three groups of practical schools would qualify to enter secondary modern schools, which were at the level of academic secondary schools (O-level). The emergence of these schools required much attention to the coordination and supervision of the education system in the country. In fact, the Governor of Uganda set up a committee in 1953 to study and make recommendations on the future of education in Uganda. To strengthen coordination, the committee recommended that district councils establish

education committees to conduct their day-to-day business in the districts (Uganda Protectorate 1953:6). These efforts were motivated by the Education Ordinance of 1959 that provided for universal education and stipulated that any child, regardless of his or her race or religion, should be able to attend any school in Uganda. This provision challenged the Government to ensure standards in education. Thus, in 1962, the Government set up a committee to provide a report on the needs and priorities of education. This provided guidelines that paved the way for the context of university education standards in Uganda. The committee's report gave credit to the contribution of university education to the development of education in the country. It noted that:

*The university gives a clear lead and provides effective co-operation that can be achieved between the academic institutions and other post-secondary institutions of diploma-or certificate-grading standard (University of East Africa 1962:94).*

With the challenges posed by independence in 1962, the Government decided to chart the way forward for an independent Uganda as far as education was concerned. For this purpose, the Government appointed the Castle Education Commission of 1963. The Castle Report provided policy guidelines for the education system in Uganda until 1987 (Uganda Education Commission 1963:7). These guidelines were adopted in the Education (Amendment) Act of 1963 to ensure effective control of educational planning and development throughout the country (Tiberondwa 1975:20; Ssekamwa 1997:165 and Ssekamwa & Lugumba 2001:16). The commission set up a 3-stage education structure:

**First Stage:** The commission recommended a primary education that should begin at the age of 6 years and should extend for 7 years. At the completion of this level, a candidate would obtain a Primary Leaving Certificate (PLC). Emphasis at this level was placed on producing pupils who would be better prepared for life and future study.

**Second Stage (Post-primary institutions):** At the end of primary education, a proportion of pupils would be selected for admission to one of the following forms of post-primary education:

- **Secondary schools (4 years):** These schools would offer an education which aimed at achieving the all round academic development of pupils. These schools would offer academic courses in science and arts subjects although some of them could be technically oriented. On the completion of 4 years in secondary school, some candidates would enrol in the high school certificate level for 2 further years in more specialised



academic subjects while others would enrol at technical, agricultural or teacher training colleges.

- **Technical schools (4 years):** Conducting courses leading to City and Guilds examinations or their equivalent.
- **Rural Trade, Farm or Vocational schools (3-4 years):** Conducting courses of similar standard to those of technical schools.
- 

**Third Stage:** After the second stage, candidates could either enter the third stage of education, which included university, teacher training colleges, the Kampala Technical Institute and agricultural colleges, or join other professional institutions. Appendix 4.1 illustrates the structure of the education system in Uganda between 1963 and the 1970's.

The Report recommended that facilities should be provided for the transfer of students from one institution to another. The result of the Castle Report was the enactment of the Education Act in 1963, which aimed at creating unity among Ugandan nationals, producing enough qualified Ugandans and promoting the ideology of an African identity and African personality.

In an effort to address the need for control and governance of the then mushrooming private schools run by missionaries, UNESCO (1969) carried out a study to establish priorities in educational development in Uganda. The Report of this study showed the significant role played by private schools in educational development in Uganda. Basing legislation on this Report, the government enacted the *Education Act, 1970*, which entrusted the Chief Education Officer (Director of Education) with powers regarding the establishment and management of schools (Uganda 1970c: Article 1(1)).

The Education Act, 1970, guided the education system in Uganda until in 1987 when the Government set up the Uganda National Education Policy Review Commission, to review the entire education system and recommend new steps. These recommendations formed the basis of the Government White Paper on Education 1992, which guides the current reforms and development of the education system in Uganda.

### 4.3 The Present Structure of the Education System

The present system covers formal, informal, and adult education (Ministry of Education and Sports 2002<sub>a</sub>:10). However, the education structure is defined according to the three levels of formal education (Ministry of Education and Sports 2002<sub>a</sub>:10). These levels are: pre-primary and primary, secondary (post-primary) and tertiary (post-secondary) (Uganda. Ministry of Education and Sports 1992:177-179). More details are provided in Table 4.1 and Appendix 1.1.

#### 4.3.1 Pre-Primary and Primary Education

**a) Pre-Primary:** Pre-primary education aims at developing language and communication skills amongst children. It also aims at helping children to develop good social habits and enabling them to appreciate their cultural background and customs (Uganda. Ministry of Education and Sports 1992:35). Pre-primary education is normally offered in day-care centres, nursery schools and kindergartens. The majority of the private primary schools possess a pre-primary section. At the moment, pre-primary education is not a compulsory prerequisite for primary education. According to the current draft education bill of the Ministry of Education and Sports (2002<sub>a</sub>:11), pre-primary education is to be run by the private sector for children from the ages of two to five. However, the Government shall:

- Provide a curriculum and guidelines on minimum standards for relevant facilities in schools.
- License, register and inspect all schools, including pre-primary schools.
- Provide the curriculum for teachers and ensure effective teaching in pre-primary institutions.

**b) Primary Education:** In Uganda, the primary school level is intended to be universal and compulsory, providing basic education for a period of seven years, and is accessible to all pupils aged six years (Ministry of Education and Sports 2002<sub>a</sub>:11). Universal Primary Education (UPE) is a government strategy to enable every child of age six to 13 years to receive free education (Uganda. Ministry of Education and Sports 1992:42). This level enables individuals to acquire functional literacy and develop abilities for lifelong learning. After the end of primary education, successful candidates receive a Primary Leaving Certificate (PLC), which is a prerequisite for secondary education or its equivalent.

### 4.3.2 Post-Primary Education (Secondary Level Education)

This includes secondary education and business, technical and vocational education training (BTVET). Secondary education comprises two levels: Ordinary Level and Advanced Secondary Level (A-level).

**a) Ordinary Level Education (O-Level):** This occupies four years of lower secondary education or three years of business, technical and vocational education training (BTVET) (Ministry of Education and Sports 2002<sub>a</sub>:11). Lower secondary education aims at instilling positive attitudes towards productive work, and laying a foundation for further education. At the completion of the O-Level, a successful candidate obtains a Uganda Certificate of Education (UCE).

The BTVET, including community polytechnics, aims at establishing multi-skills training and development opportunities for primary school leavers as well as for interested citizens in the community (Uganda. Ministry of Education and Sports 2001<sub>a</sub>:8). The UCE or its equivalent is a prerequisite for A-level or its equivalent. The polytechnics offer alternative access to post-primary education (Bbowa Community Polytechnic 2003:1). Polytechnics in this sense comprise institutions teaching many sciences, technical or vocational subjects (Uganda. Ministry of Education and Sports 2001<sub>a</sub>:4). These institutions were established to meet the challenge of the large numbers projected by 2003 as a result of Universal Primary Education. They were also established to reduce unemployment through skills training.

**b) A-level Secondary Education (Higher School):** This level occupies two years of education after O-Level. It provides students with wide choices of subjects for which a few are chosen in a combination as a basis for specialisation. After the A-Level, the Uganda National Examination Board (UNEB) offers the Uganda Advanced Certificate of Education (UACE) or its equivalent to a successful candidate. This also applies to Primary Leaving Certificate (PLC) and Uganda Certificate of Education (UCE) for primary and lower secondary level respectively as explained earlier. Those students who do not obtain the A-Level may enter equivalent institutions: primary teacher colleges (PTC), business, technical and vocational education training (BTVET). For example, primary teacher education that takes two years, aims to skilfully impart to learners knowledge to help them develop both the desire and ability to teach in primary schools (Uganda. Ministry of Education and Sports 1992:136). The Uganda Advanced Certificate of Education (UACE) or its equivalent is a prerequisite for higher/tertiary education. Appendix 1.1 illustrates

the current structure of the education system in Uganda.

**4.3.3 Tertiary (Higher) Education:** This level aims at producing high level manpower. It aims at equipping students with knowledge, skills and attitudes to enable them to enter the world of work. It is obtained from universities and other tertiary institutions, as will be explained later in this chapter. The summary of enrolment and entry requirements for various types of educational institutions is provided in Table 4.1 below. The Key is below the table.

**Table 4.1: Types of educational institutions In Uganda.**

Level	Requirements	Period of study	No of Institutions	Enrolment	The Award obtained	Awarding Body	Ownership
Pre-primary level	Admits children Below 6 years	3 years	1,035	78,256	No designated Award	Schools	Private
Primary Education	Start at the age of 6 years	7 years	14,420	7,354,153	Primary Leaving Certificate	UNEB	Government and Private
Community Polytechnics	PLC	3 years	16	3200	Junior Certificate	UNEB	Government and Private
Lower Senior Secondary Education	PLC	4 years	2198	483,804	UCE	UNEB	Government and Private
Upper Secondary (High School.)	UCE	2 years	900	55,982	UACE	UNEB	Government and Private
Business, Technical, Vocational Education Training (BTVET) Institutions	UCE or Junior Certificate	2 years	70	18,186	Certificate	UNEB	Government and Private
Primary Teachers Colleges	UCE, Grade II Certificate	2 years	47	27,500	Grade III Certificate	Kyambogo University	Government
<b>Post-Secondary Programmes</b>							
Community Polytechnic Instructors College	UACE with certificate in BTVET	2 years	1	60	Technical Teaching Certificate	Kyambogo University	Government
National Teachers Colleges (NTC)	UACE or UCE+ Grade III Certificate	2 years	6*	14,615	Diploma in Primary Education (DPE), Diploma in Secondary Education (DSE)	Kyambogo University	Government
Uganda Colleges of Commerce (UCCs)	UACE or UCE+ Business Certificate	2 or more	5	2,896	Diploma in Business Studies, Certificates	Makerere University Business School	Government
Uganda Technical Colleges (UTCs)	UACE or UCE+ Technical certificates	2 years	5	812	Diploma, Certificates	UNEB and Kyambogo University	Government
Agricultural, co-operative and Forestry, Fisheries and veterinary training colleges	UACE or UCE + Certificate in a Related Discipline	2 Years	7	1,559	Diploma, Certificate	Institutions	Government
Paramedical Schools	UACE or UCE+ Related Certificate	2 to 4 years	27	4574	Diploma, Certificates	Institutions	Government
Weather and Land Science	UACE	2 to 4 years	2	53	Diploma, Certificate	Institutions	Government
Leisure	UACE	2 to 3 years	2	280	Diploma, Certificate	Institutions	Government
Public Universities	UACE or its Equivalent Diplomas Certificates	3 to 5 years	4+	46, 566	Certificates Diplomas Degree Postgraduates	Universities	Government

	Degrees				Masters Doctorates		
Private Universities	--do--		15	21, 513	--do--	Universities	Private

**Key:** *PLC: Primary Leaving Certificate;*

*UCE: Uganda Certificate of Education;*

*UACE: Uganda Advanced Certificate of Education;*

*BTVET: Business, Technical and Vocational Education Training;*

*UNEB: Uganda National Examination Board*

**Notes:**

- \*After 1985 there were 10 NTC's, but the Government recently closed four of them including Kabale, Kakoba, Masindi and Nkozi. The students of those NTC's have been transferred to the remaining six colleges.
- + In addition to 4 Public Universities, one Other Public Tertiary Institution (Uganda Management Institute), possessing the status of an Other Degree Awarding Institution, has been proposed.

*Source:*

*Ministry of Education and Sports (2002<sub>c</sub>)*

*Ministry of Education and Sports. Business Technical and Vocational Education Training (2005)*

*Ministry of Education and Sports. Education Planning Department (2001)*

*National Council for Higher Education (2004)*

*National Council for Higher Education (2005).*

*Uganda. Ministry of Education and Sports (2002<sub>c</sub>)*

*Uganda. Ministry of Education and Sports (2003<sub>a</sub>)*

*Uganda. Ministry of Education and Sports (2002<sub>b</sub>)*

*Uganda (2005<sub>b</sub>)*

In addition to the four levels of education, the Ministry recognises non-formal and adult education (Uganda. Ministry of Education and Sports 1992). This type of education aims at attainment of permanent and developmental functional literacy skills, at awareness of individuals relevant to the life of the community and at individuals' continued learning while at work and at home (Ministry of Education and Sports 2002<sub>a</sub>: 12). In an effort to consolidate and streamline the existing laws relating to the development and regulation of non-formal and adult education, the Ministry of Education and Sports *Education Bill* in 2002 proposed the establishment of the National Council for Non-Formal and Adult Education. The role of the council is to coordinate inter-ministerial programmes in the areas of adult and non-formal education.

In the management, financing, support, and promotion of education, there are a number of key players in the country as discussed in the section below.

#### **4.4 Key Players in the Education System in Uganda**

The development and management of the education system is the joint responsibility of various stakeholders (Fernig 1980:13). In Uganda, these stakeholders include the national governing bodies, local governments, and educational institutions.

##### **4.4.1 National Governing Bodies**

No system can exist wholly independent of state influence. According to the Constitution of the Republic of Uganda, the Government consists of three arms (organs) of government (Uganda 1995<sub>a</sub>: Chapter Six to Chapter Eight): the legislature, the judiciary, and the executive.

###### **a) The Legislature**

The legislature performs its duties through the Parliament. The Parliament, has the power to make laws on any matter for the peace, order, development and good governance of the country (Uganda 1995<sub>a</sub>:Article 79(1)). The Parliament through its Committee on Social Services has the power to initiate, discuss and make recommendations on all bills and policies concerning education before Parliament (Uganda 1995<sub>a</sub>: Article 90(3)). The Committee is also supposed to carry out relevant research, to assess and to evaluate activities of Government and other bodies in all social services, including education. Moreover, members of Parliament have the following roles: to mobilise communities, interpret to their constituencies the current government policies, participate in school development programmes, solicit education development funds and attract non-government organisations into educational development.

###### **b) The Judiciary**

Judicial power is derived from the people and is exercised by the courts (Uganda 1995<sub>a</sub>: Chapter

Eight, Article 126 (1)). The Courts of Judicature consist of: the Supreme Court, the Court of Appeal, the High Court and such other courts as Parliament may establish by law (Uganda 1995<sub>a</sub>: Chapter Eight, Article 129(1)). There are various levels of information kept by the judiciary, including cases, hearings, appeals, and judgements on or about individual, public or private corporations (including educational institutions), and the Executive.

### **c) The Executive**

The executive authority of Uganda is vested in the President and is exercised in accordance with the constitution and the laws of Uganda (Uganda 1995<sub>a</sub>: Article 99(1) and Article 111(2)). The constitution empowers the Cabinet to determine, formulate, and implement government policies (Uganda 1995<sub>a</sub>: Article 111(2); Ministry of Education and Sports 2002<sub>a</sub>:9).

The three arms of Government are all together responsible for various functions and services which among others include: the national census and statistics, national standards, educational policy, making national plans for the provision of services and coordinating plans made by the local governments, among other bodies (Uganda 1995<sub>a</sub>: Sixth Schedule).

#### **4.4.2 Local Governments**

The Ministry of Local Government is responsible for the administration and implementation of the decentralised governance in the country. Article 97 of the Local Government Act, of 1997, states:

*For purposes of ensuring implementation of national policies and adherence to the performance of standards on part of local government, ministries should inspect, monitor, and shall where necessary offer technical advice, support supervision and training within the sectors (Uganda 1997<sub>a</sub>: Article 97).*

The Local Government System is based on a Council at every level and has political authority within the area of jurisdiction and shall have the legislative and executive powers to be exercised in accordance with the constitution (Uganda 1997<sub>a</sub>: Article 10(1)). Like any other government department, Local Government councils in the decentralised system affect policies in the education sector at all the levels of governance. Furthermore, according to *the Government White Paper on the Report of the Commission of Inquiry (Constitutional) Review, 2004*, the Government is proposing a Regional Tier system. According to this proposal, districts may, if

they wish, choose to form regional governments (Uganda 2004<sub>a</sub>: Chapter 8.3) which are to be run on resources provided by the Central Government (Uganda. State House 2004). The aim of regional governments is to facilitate and coordinate the political and administrative functions and responsibilities of local authorities through the respective regional councils as provided for by the constitution.

These local authorities require adequate, accessible and usable information in order to implement government policies. To obtain such data, local governments need to be coordinated with the educational institutions that generate and keep data. Below follows an analysis of the responsibilities of various stakeholders in local government.

**Table 4.2 Stakeholders in Local Government**

Stakeholders	Roles
The Resident District Commissioners (RDCs)	Chief monitors of government programmes, overseeing the implementation of government programmes, sensitising stakeholders to the programmes, monitoring use of government grants, and monitoring efficient and effective running of schools.
Chief Administrative Officers	The chief executive of the district, ensures prompt accountability regarding government grants, informs the district councils about the implementation of the government programmes, makes regular visits to schools, and keeps regular records of pupils and schools in the area of their jurisdiction.
Local Authorities/Local Government Councils	Monitoring and ensuring successful implementation of government programmes by contributing to the development of educational policies in the country. Involved in planning, development and evaluation of education in Uganda.
District Education Office and Inspectorate	The districts too have responsibilities for inspection and supervision of schools, the overall administration and inspection of schools in the district, implementing government policy; Providing technical advice on education regarding political leadership, ensuring quality performance from school management, and ensuring that the educational minimum standards are maintained.
Sub County Chiefs	They represent the Chief Administrative Officer (CAO) at sub-county levels and are therefore responsible for enrolment at and proper management of schools. They make regular visits to schools, keep regular records of both students/pupils and teachers and schools, submit regular reports on education to the CAO and ensure proper use and accountability of funds in schools.

Source: Uganda (1997<sub>a</sub>)

Uganda. Ministry of Education and Sports (1992)

Uganda. Ministry of Education and Sports (1998<sub>b</sub>)

The various levels of the decentralised system operate from Local Council I (village), Local Council II (Parish or ward), Local Council III (Sub-county), Local Council IV (County) to Local Council V (district level) (Uganda 1997<sub>a</sub>: Article 24) and the proposed Regional Council (Uganda 2004<sub>a</sub>). At all these levels, the councils handle matters concerning education in their jurisdictions and coordinate with educational institutions accordingly.

#### 4.4.3 Educational Institutions



The history of the governance of schools dates back to Legal Notice No. 129 of 1962 and the provisions of Education Ordinance 1963 (Ssekamwa & Lugumba 1973:106). There are various partners in the management and governance of educational institutions. Currently, the executive positions in the education institutions include the councils of universities, boards of governors of secondary and tertiary institutions, and management committees of primary schools. Other partners include parents, foundation bodies, administrators, educators, learners, parents and the public. The table below summarises various responsibilities in the management of educational institutions.

**Table 4.3 Responsibilities in the Management of Educational Institutions**

<b>Partners</b>	<b>Responsibilities in the management of educational institutions</b>
Governing Councils/ Boards of Governors or School Management Committees	<ul style="list-style-type: none"> <li>◆ The administration, and proper and efficient conduct of schools under their charge.</li> <li>◆ Responsible for exercising supervisory control, studying carefully the audited accounts, approving the headmaster's estimates, and handling disciplinary cases.</li> <li>◆ The statutory organ of the institution.</li> <li>◆ It provides the overall direction of the school, approving development plans, and ensuring quality education.</li> <li>◆ Oversees school policy formulation and implementation, with duties of supervising school budgets, reviewing education performance, overseeing student and staff discipline, and making plans for school facilities.</li> </ul>
Administration	<ul style="list-style-type: none"> <li>◆ The operation of the school.</li> <li>◆ Heads of the educational institutions at various levels of the education system have the executive responsibility for the institutions.</li> <li>◆ One of the principal roles of an administrator is to keep proper records of students/pupils in an institution.</li> </ul>
Foundation bodies	<ul style="list-style-type: none"> <li>◆ The various foundation bodies including the Catholic Church, Church of Uganda, the Muslim faith, the Seventh Day Adventists, the Government of Uganda and the private sector.</li> <li>◆ Foundation bodies monitor and ensure standards, integrate government policies and see to proper implementation of policies. All educational institutions function according to the policies of the founding bodies.</li> </ul>
The educators include lecturers, tutors, teachers and instructors	<ul style="list-style-type: none"> <li>◆ To skilfully impart to learners knowledge to help them develop both the desire and ability to learn.</li> <li>◆ Provide appropriate guides and counselling to students. They communicate to parents about the affairs of their children regarding their reading habits, talents and students' wishes.</li> <li>◆ Participate in selection of students, management of examinations, keeping of students' marks/results, disciplinary control, supervision and invigilation of examinations.</li> </ul>
Learners (Students, pupils)	Main beneficiaries of education institutions. Work through leaders like class monitors, prefects, school councils, the University Guilds and the Uganda National Students Association (UNSA) which coordinates students' affairs in the country.
Parents	Participate in leadership of schools, and support school programmes by mobilising the entire community through Parents Teachers Associations (PTAs), which are voluntary organisations catering for the welfare of students, teachers, and the development of the schools.
The Public/Community	Alumni Associations influence the culture of their alma mater for the wellbeing of their institutions. Others in the public sector include: various Non Governmental Organisations (NGO), Community Based Organisations (CBOs), mass media, and the Uganda Teachers Association (UTA).

Source: Ministry of Education and Sports 2002<sub>a</sub>

*Uganda. Ministry of Education and sports (1992)*  
*Uganda. Ministry of Education and sports (1998<sub>b</sub>)*

From the above table, it is clear that different stakeholders contribute to the management of educational institutions. These institutions coordinate with local governments and the executive (central government) in implementing policies concerning them through the structures of Ministry of Education and Sports.

#### **4.5 The role of the Ministry of Education and Sports**

The vision of this Ministry is ‘quality education and sports for all’ (Uganda. Ministry of Education and Sports 2002<sub>b</sub>: [4]). It is therefore the Ministry’s mission to provide support for, guide, cooperate with, regulate and promote quality education and sports for all persons in Uganda, for national integration, individual and national development (Uganda. Ministry of Education and Sports 1998<sub>a</sub>:24). The vision and mission of the MoES aim at meeting the national goals and objectives of education that include the provision of quality education and eradicating illiteracy; at equipping the individual with the basic knowledge, skills and attitudes to exploit the environment for self and national development in order to enjoy better health, nutrition and family life; and at developing a capability for continued learning at the lowest affordable cost (Ministry of Education and Sports 2000<sub>b</sub>:iv).

Currently the offices of the Cabinet Minister of Education and Sports and three State Ministers namely: the Minister of State for Higher Education, the Minister of State for Primary Education and the Minister of State for Sports shoulder the overall responsibility as the political leaders of the sector. The office of the Permanent Secretary is responsible for the overall supervision of the Ministry as per Article 174 of the Constitution of the Republic of Uganda (Ministry of Education and Sports 2000<sub>b</sub>:21). The Permanent Secretary is the chief executive of the MoES, assisted by the Director of Education, the Under Secretary and Commissioners for various line departments (Ministry of Education and Sports 2000<sub>a</sub>:v) and is responsible for implementing the policy. The line departments include Departments of Pre-primary and Primary Education, Secondary Education, Business, Technical and Vocational Education Training (BTVET), Teacher Education, Educational Planning, Special Education and Career Guidance, and Higher Education. The macrostructure of the Ministry of Education and Sports is illustrated in Appendix 4.2.

The key functions of the Ministry of Education and Sports (Uganda. Ministry of Education and Sports 2002 a:9) are:

- the development and formulation of national education policies and plans and guiding of their implementation.
- to monitor and evaluate educational policies, plans and delivery of services.
- to collect and process relevant data and information for educational planning.
- to provide the mechanism and framework for admission of students to educational institutions.
- the setting, disseminating, monitoring and evaluating of minimum national standards.
- the setting and administering of national examinations.

Table 4.4 below summarises some of the core functions of the Ministry, indicating the responsible offices or departments in the sector. The key is below the table.

**Table 4.4 The various Functions and Responsibilities of MoES**

Functions	Major responsibility	Support responsibility
1. Policy formulation and implementation		
<ul style="list-style-type: none"> <li>◆ Monitoring the delivery of quality service in the country</li> <li>◆ Initiating policies and reforms of education as needs arise</li> <li>◆ Ensuring that the national policies and objectives are observed and implemented</li> <li>◆ Ensuring statutory harmony and continuity of the decentralised delivery with national policy.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Cabinet and State ministers</li> </ul>	<ul style="list-style-type: none"> <li>◆ Permanent Secretary, Policy Analysis Unit</li> </ul>
<ul style="list-style-type: none"> <li>◆ Overall supervision of the Ministry</li> <li>◆ Implementation of government policies</li> <li>◆ Accounting Officer of the Ministry</li> <li>◆ Research, analysis, development and formulation of policies, and ensuring overall conformity with national policies for effective functioning of the Ministry.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Permanent Secretary</li> </ul>	<ul style="list-style-type: none"> <li>◆ Director of Education</li> <li>◆ Under Secretary</li> <li>◆ Commissioners for line departments, and</li> <li>◆ Policy Analysis Unit</li> </ul>
2. Monitor and Evaluate educational policies, plans, and delivery of services		
<ul style="list-style-type: none"> <li>◆ Implementing the policy provisions of the education sector, the <i>Education Service Act 2002</i>.</li> <li>◆ To makes regulations for the education service in pursuance of Articles 167 and 168 of the Constitution and for other matters related to the Education Service.</li> <li>◆ To research, analyse, develop and formulate national standards for the education service in respect of training and qualifications of officers in the education service.</li> <li>◆ The commission also ensures ethics, conduct and disciplinary control in the sector.</li> <li>◆ It is also responsible for establishing and maintaining a record of all public officers in the education service.</li> <li>◆ It is its responsibility to link ministries, schools and higher education for the purpose of developing labour market information in the sector.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Education Service Commission</li> </ul>	<ul style="list-style-type: none"> <li>◆ Line Departments in MoES,</li> <li>◆ District Service Commission, and</li> <li>◆ Public Service Commission</li> </ul>
3. Setting, disseminating, monitoring and evaluating minimum national standards		

<ul style="list-style-type: none"> <li>◆ Development of guidelines for school supervision</li> <li>◆ Carrying out inspection work for the education sector</li> <li>◆ Inspection of schools at district level</li> <li>◆ Maintaining quality and disciplinary standards in the education sector and institutions</li> <li>◆ Custodian of standards</li> <li>◆ Monitoring, inspecting, and supervising on teaching and professional matters.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Educational Standards Agency</li> </ul>	<ul style="list-style-type: none"> <li>◆ Regional inspection centres, Departments</li> <li>◆ District education office</li> <li>◆ Primary Teachers colleges (PTC), Centre coordinating tutors</li> </ul>
<ul style="list-style-type: none"> <li>◆ Develop curriculum for primary and secondary schools, BTVET, PTCs.</li> <li>◆ Evaluates examination questions and methods of examining.</li> </ul>	<ul style="list-style-type: none"> <li>◆ National Curriculum Development Centre (NCDC).</li> </ul>	<ul style="list-style-type: none"> <li>◆ Uganda National Examinations Board (UNEBC), University (e.g. Kyambogo for PTCs), line Departments</li> </ul>

4. Collection and processing of relevant data and information for educational planning and management		
<ul style="list-style-type: none"> <li>◆ To develop coordinated planning policies and strategies that are consistent with other sectoral policies and plans.</li> <li>◆ To advise top management on education strategic objectives for education.</li> <li>◆ To develop a management information system that supports education planning, management, monitoring and evaluation.</li> <li>◆ To design and implement information systems for educational planning, management, monitoring and evaluation.</li> <li>◆ Coordination of research programmes and evaluation of policy studies, and responsibility for the library and documentation services in the ministry.</li> <li>◆ It is the division's role to collect, process, and disseminate statistics and data on schools, colleges and tertiary institutions.</li> <li>◆ Development and implementation of a full set of inter-linked indicators for the sector and sub-sectors, including a mechanism for collection of educational information.</li> <li>◆ Create and maintain an education sector database, design, analyse and update the information system and coordinate the implementation of an Educational Management Information System</li> </ul>	<ul style="list-style-type: none"> <li>◆ Educational Planning Department through their respective sections: Statistics, Monitoring and Evaluation, and</li> <li>◆ Educational Planning, Project Formulation and Budgeting</li> </ul>	<ul style="list-style-type: none"> <li>◆ Other departments</li> <li>◆ District Education offices</li> <li>◆ Schools</li> </ul>
5. Provide the mechanism and framework for admission of students to educational institutions		
<ul style="list-style-type: none"> <li>◆ Occupational and psychological assessment</li> <li>◆ Assisting students to decide their future careers</li> <li>◆ Providing a link between a student's present status and future plans</li> <li>◆ Placement of students into Senior one (S1) and senior five (S5) and their equivalencies.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Special education and career guidance department</li> </ul>	<ul style="list-style-type: none"> <li>◆ Schools, higher education, District Education Offices, line departments, UNEB</li> </ul>
<ul style="list-style-type: none"> <li>• Admission into higher education</li> </ul>	<ul style="list-style-type: none"> <li>◆ Joint Admissions Board</li> </ul>	<ul style="list-style-type: none"> <li>◆ Universities, Other tertiary institutions, Department of Special Education, and Career Guidance, NCHE, UNEB</li> </ul>
6. Setting and administering national examinations		
<ul style="list-style-type: none"> <li>◆ Conduct primary, secondary, technical and such other examinations within Uganda as it may consider desirable in the public interest; award certificates or diplomas to successful candidates in such examinations.</li> <li>◆ It is also responsible for making rules regulating the conduct of examinations and for all purposes incidental thereto</li> </ul>	<ul style="list-style-type: none"> <li>◆ UNEB</li> </ul>	<ul style="list-style-type: none"> <li>◆ Line departments</li> <li>◆ District Education Offices</li> <li>◆ Police</li> <li>◆ Examination centres (schools)</li> </ul>

**Source**

Ministry of Education and Sports (2002<sub>a</sub>)  
 Uganda. Ministry of Education and Sports (1992).  
 Uganda. Ministry of Education and Sports (1998<sub>a</sub>)  
 Uganda. Ministry of Education and Sports (2002<sub>a</sub>)

**Key:**

UNEB: Uganda National Examination Board  
 BTVET: Business, Technical and Vocational Training Education

NCHE: National Council for Higher Education  
 PTCs: Primary Teachers Colleges

From the table above, it is clear that Uganda National Examination Board (UNEB) seems to play a major role in coordinating the various institutions. For example, UNEB sets examinations for

various levels of education: Primary Leaving Examination (PLE), Uganda Certificate of Education (UCE), Uganda Advanced Certificate Examination (UACE), Uganda Business Education Examination (UBEE), Uganda Technical Education Examination (UTEE), and Uganda Junior Technical Examination (UJTE) (Uganda. Ministry of Education and Sports 1999<sub>b</sub>:44). UNEB is required to issue a Certificate to every pupil/student who qualifies for it at the end of the education level (Uganda. Ministry of Education and Sports 2003<sub>b</sub>:7). If a student is admitted into higher education, it is the role of higher education to manage and coordinate student information. The next section will discuss the state of higher education in Uganda in order for the researcher to be able to establish the information management challenges for the sector.

#### **4.6 The State of Higher Education in Uganda**

Higher and tertiary education in Uganda are used interchangeably to refer to the post-secondary system of formal education (Uganda. Ministry of Education and Sports 1992; Uganda. Ministry of Education and Sports 2003<sub>a</sub>:8). It aims at equipping students with skills and attitudes to enable them to join the employment sector as useful members of their communities. The Department of Higher Education under the MoES is responsible for the monitoring and supervision of the activities of all the institutions of higher learning. According to the profile of the MoES, the goals of the Department of Higher Education in the Ministry are to ‘supervise, coordinate and guide the admission, training and teaching at all institutions of higher learning’ (Uganda. Ministry of Education and Sports 2002<sub>a</sub>:66). To achieve the above goals, the Department of Higher Education performs the following functions:

- Monitors implementation of government policies at higher education institutions;
- Through the Joint Admission Board (JAB) undertakes the admission of A-level students to tertiary institutions;
- Formulates policies on admission to tertiary institutions;
- Provides relevant technical advice to policy makers regarding higher education;
- Executes policies, procedures and regulations pertaining to scholarships and admissions to higher institutions of learning;
- Coordinates activities of the Inter University Council of East Africa.

The Higher Education Department has two distinct sub-sectors: the universities and other tertiary institutions.

##### **4.6.1 University Sub-sector**

The university sub-sector consists of higher institutions of learning, licensed and registered under the Universities and Other Tertiary Institutions Act of 2001 as universities (Uganda. Ministry of Education and Sports 2003<sub>a</sub>:8).

The Department of Higher Education monitors the functioning and operations of public and private universities (Uganda. Ministry of Education and Sports 2002<sub>b</sub>:67). Public universities are semi-autonomous bodies operating under the Ministry responsible for education in the country. They operate under the provisions of the Acts establishing them and the provisions of the Universities and Other Tertiary Institutions Act (Uganda 2003<sub>c</sub>:Article 1). The main objective of a University is to promote the intellectual, social and education mission of the government.

Uganda had only one public university—Makerere University (MUK)—that had been the apex of the education system (Ssekamwa 1997:42) until 1988. Makerere University was founded in 1922 as a technical college. On 1 July 1970, Makerere University became an independent national university of the Republic of Uganda offering and awarding undergraduate and postgraduate degrees (Uganda 1970<sub>b</sub>). The Makerere University (interim provisions) Act 1970 granted Makerere University College full university status and gave it authority to operate as an autonomous institution. This provision was enacted on 5<sup>th</sup> October 1970, to allow it to:

- admit to the university candidates for degrees, diplomas, certificates and other awards of the university,
- assume responsibility for university education within Uganda and work with other appropriate bodies in the planned development of higher education, and
- conduct examinations for and grant degrees, diplomas and other awards of the university and the revocation of such awards in the manner provided for by this Act. (Uganda 1970<sub>b</sub>: Article 2.)

In 1988, the government passed a statute establishing a second university, Mbarara University of Science and Technology (MUST) (Uganda 1991<sub>b</sub>). The Mbarara University of Science and Technology Statute of 1991 provided for its constitution, functions, and administration (Uganda 1991<sub>b</sub>). The University started with three faculties: Science Education, Development Studies and Applied Science and Technology (Mbarara University of Science and Technology 2000:21). With the findings of the Education Policy Review Commission (1989) that there was a necessity for the expansion of tertiary education, the Government of Uganda established the Islamic University in Uganda (IUIU) (Uganda 1990). According to the Islamic University in Uganda Statute, the government assumes no obligation for its funding, which is the responsibility of the Council and the Executive Board established by the Statute. All public universities have a students' association

(Guild) whose constitution, functions, and privileges are established by the Councils of the Universities. In addition, the Acts provide for a convocation that consists of graduates of the University to discuss any matter within the sphere of competence of the university.

The White Paper on Education in 1992 (Uganda. Ministry of Education and Sports 1992:96) recommended the establishment of two other national universities — one in the north and the other in the east — when the necessary resources become available. The White Paper also recommended the merger of the former Uganda Polytechnic Kyambogo (UPK), the Institute of Teacher Education Kyambogo (ITEK), and the National College of Business Studies (NCBS) into one Uganda polytechnic. To work towards the implementation of the White Paper's recommendations, the government took the following steps:

1. In 1998, the Minister of Education and Sports by statutory order invoked the Makerere University Act, 1970 and declared Makerere University Business School (MUBS) a constituent college of Makerere University. Makerere University Business School merged the former Faculty of Commerce of Makerere University and the National College of Business Studies, Nakawa. Currently, Makerere University Business School provides leadership in business and management education and training. It coordinates and supervises all examinations of the Uganda Colleges of Commerce (UCCs). Makerere University Business School is mandated to update and manage examinations of all the Uganda Colleges of Commerce (UCCs) and privately run colleges which may seek affiliation to MUBS (Uganda. Ministry of Education and Sports 2002<sub>c</sub>:67). This function was formally mandated to the National Business Education Examination Council (NBEEC), the former examining body of all UCCs (Uganda. Ministry of Education and Sports 2002<sub>c</sub>:87). Administratively, all UCCs fall under the Department of Higher Education.
2. Kyambogo University has been established by merging the former Uganda Polytechnic Kyambogo (UPK), the Institute of Teacher Education Kyambogo (ITEK), and the Uganda National Institute for Special Education (UNISE) (Uganda 2003<sub>c</sub>: Article 3). Kyambogo University has the mandate to supervise all National Teachers Colleges (NTCs) and Primary Teachers Colleges (PTCs) in order to maintain high academic standards (Uganda. Ministry of Education and Sports 2002<sub>b</sub>:75). These colleges fall under the direct administration of the Departments of Higher Education and Teacher Education respectively at the Ministry of



Education and Sports. The University is also responsible for coordinating the academic matters of all Uganda Technical Colleges (UTCs) (Uganda. Ministry of Education and Sports 1999<sub>b</sub>:33). All NTCs and PTCs are affiliates of the university. The University supervises all academic and professional activities in these colleges. It also takes responsibility for their curricula, examinations and certification of programmes and matters relating thereto, and for visitations to these institutions.

3. To meet the White Paper recommendation of establishing a University in northern Uganda, Gulu University has been established (Uganda. Ministry of Education and Sports 2003<sub>c</sub>: Article 2 (1): 309). It is located at the Gulu District Farm Institute. Members of the interim university management team have been appointed subject to the Universities and Other Tertiary Institutions Act, 2001. Gulu and Kyambogo Universities are now fully operational in terms of enrolment and administration.
4. In a similar development, the Universities and Other Tertiary Institutions Act, 2001 repealed the section relating to the Uganda Management Institute whose function was ‘to conduct examinations and grant certificates, diplomas and degrees and other awards of the Institute and its affiliates’ (Uganda 2005<sub>b</sub>). This Act however did not make any provision for the establishment of institutions of higher education that award degrees but are not Universities, such as the Uganda Management Institute. The Universities and Other Tertiary Institutions (Amendment) Bill, 2005 is proposing an amendment in the Universities and Other Tertiary Institutions Act, 2001, to allow for the establishment and management of Other Degree Awarding Institutions (Uganda 2005<sub>b</sub>: Clause 13). According to this Bill, the Uganda Management Institute shall be deemed to have been established as a public Tertiary Institution having the status of an Other Degree Awarding Institution (Uganda 2005<sub>b</sub>: Clause 21).
5. The MoES is required to guide privately-funded institutions to serve the goals of education. Several private universities have emerged and have been licensed to cater for A-level leavers who cannot be absorbed in public universities. Since 1988, 15 private universities have been licensed and/or registered by the Government of Uganda: Islamic University in Uganda (1988), Uganda Martyrs University, Nkozi (1993), Nkumba University (1996), Bugema University (1997), Uganda Christian University, Mukono (1997), Busoga University (1998), Ndejje University (1999), Kampala University (2000), Kampala International University (2001), Aga Khan University (2001),

Kumi University (2004), Kabale University (2005), Mountains of the Moon University (2005), Uganda Pentecostal University (2005), and African Bible University (2005) (National Council for Higher Education 2005). The increase in the number of higher education institutions demands the deliberate planning of a differentiated, integrated and well coordinated higher education system to meet the expectations of Ugandans (Kasozi 2003:21).

The Council is the supreme body of a university, with the chancellor as an ex-officio member (Byenkya 1996:5). The Ministry is represented on the governing councils of public universities by the Commissioner for Higher Education (Uganda. Ministry of Education and Sports 2002<sub>a</sub>:67). The Council executes its duties through various committees including Planning and Development, Establishment and Administration, Finance, Board of Management of commercial units, Students' Affairs Committee, Disciplinary and University Tender Board. Another administrative unit in the University is the Senate, whose major function is to make recommendations to Council on the academic functions of the university, namely examinations, admissions and research. The Senate also conducts its business on a committee system. These committees include Admission, Ceremonies and Honorary Degrees, Mature-age Students, Staff Development, Research Grants, Postgraduate and Higher degrees, and the committee of deans. Universities conduct examinations and award degrees to their students and those of constituent colleges or institutions. For example, Kyambogo University conducts its own examinations and those for the affiliate Primary Teachers Colleges and National Teachers Colleges. Makerere University Business School (MUBS) conducts and examines diploma courses in the Uganda Colleges of Commerce (UCC). Makerere University Business School (MUBS) has incorporated the functions of the National Business Education Examination Council (NBEEC), formerly the examining body of all Uganda Colleges of Commerce (Uganda. Ministry of Education and Sports 2002<sub>a</sub>:87). Makerere University Business School (MUBS) is an affiliate college of Makerere University. Makerere University has continuously conducted its own examinations and those for its constituent and affiliated colleges.

#### **4.6.2 Other Tertiary Institutions (Technical Sub-sector)**

The technical sub-sector or other tertiary institutions of higher education fall under the Department of Higher Education in terms of administration (Uganda. Ministry of Education and Sports 2003<sub>a</sub>:8). The other tertiary institutions include National Teachers Colleges (NTCs), Uganda Colleges of Commerce (UCCs), Uganda Technical Colleges (UTCs), and institutions that previously fell under

sector departments or ministries. There are currently 13 paramedical institutions that train health personnel to certificate and diploma level, to manage clinical and community health. The other departmental institutions for higher education include Bukalasa Agriculture College and Arapai Agriculture College that offer a three year diploma programme; Busitema National College of Agriculture Mechanisation; Fisheries and Veterinary Training Institute at Entebbe; Nyabeya Forestry College; Uganda Co-operative College Kigumba, Uganda Co-operative College Bukalasa; Tororo Co-operative College; and Uganda Management Institute (Uganda. Ministry of Education and Sports 2002<sub>b</sub>: 100-179). Most of these colleges are linked to their mother departments or the ministries they were intended to serve.

Other training institutions that have not been transferred to the MoES include: the Law Development Centre, the Lands and Survey School in Entebbe, the Management Training and Advisory Centre (MTAC), the Directorate of Industrial Training at Lugogo, the Police College and Training School, the Army Academy at Bombo, the Prisons Training School at Luzira, the Geological School and the Meteorological School at Entebbe. The full list of higher education institutions is provided in Appendix 1.2a.

#### **4.6.3 Joint Admissions Board**

Admissions to higher education are the responsibility of the Joint Admissions Board (JAB) (Ministry of Education and Sports 2002<sub>b</sub>:2). It is responsible for coordinating admissions to undergraduate diploma courses in all government-aided institutions of higher learning (Uganda. Ministry of Education and Sports 2002<sub>a</sub>:68). The Board is responsible for:

- Establishing the number of vacancies available in the institutions;
- Defining the requirements for admission to particular course programmes; and
- Enabling individual candidates to make responsible choices. (Uganda. Ministry of Education and Sports 2002<sub>a</sub>:72.)

It also acts as a clearing house for admissions into tertiary institutions in order to avoid duplicating admissions and to fill vacant places.

#### **4.6.3 Coordination of Scholarships**

The Department of Higher Education is responsible for coordinating scholarship schemes. Currently, there are a number of such schemes available:

**a) Uganda Independent Scholarship Trust Fund (UISTF):** The Trust Fund awards scholarships for postgraduates.

**b) Central Scholarship Committee:** This includes the Uganda Government's Scholarship Scheme, the Commonwealth and Fellowships Plan, and Bilateral Scholarships from other countries. The Ministry is currently considering establishing a Loan and Students Loan Scheme.

**c) The Appropriation in Aid:** This came about as a result of the abolition of cost sharing in the 2001/2002 academic year. This was meant for the admission of students into tertiary institutions through two windows: Window I was government sponsored while window II was for privately sponsored students.

**d) The Inter-University Council for East Africa (IUC):** The IUC coordinates and harmonises the academic activities of universities in the region (Uganda. Ministry of Education and Sports 2002<sub>a</sub>:69). It oversees the students' exchange and scholarship programmes (Ministry of Education and Sports 2000<sub>a</sub>:27).

#### **4.6.5 National Council for Higher Education (NCHE)**

The government of Uganda (2001<sub>d</sub>) enacted the Universities and Other Tertiary Education Act in 2001. The functions of the NCHE include the following:

- To collect, examine, promote and process, publish and disseminate information on and related to higher education for the benefit of the people.
- To advise on, receive and process applications for the establishment and accreditation of public and private institutions of higher education; register, receive and investigate complaints relating to institutions of higher education; monitor, evaluate and regulate institutions of higher education.
- To cooperate with government departments and the private sector, evaluate overall national manpower requirements, and generally advise the government on policy and matters relating to institutions of higher education.
- To ensure minimum standards for courses, set and coordinate national standards for admissions and determine the equivalence of all types of academic and professional qualifications.

- To certify and ensure adequate facilities in institutions of higher education. (Uganda 2001<sub>d</sub>: Article 5.)

It is the responsibility of NCHE to ensure maximum standards for admission and to determine their qualification equivalencies (Uganda 2001<sub>d</sub>: Article 11(11)). This requires the harmonisation of entrance requirements, the adaptation of common terminology and evaluation criteria and the effective utilisation of all resources available in the area (UNESCO 1976: xiv). In fact, in the 10<sup>th</sup> Education Sector Review in November 2003, the NCHE presented strategies for instituting a credit system for linking all tertiary institutions in each sub-sector (Uganda. Ministry of Education and Sports 2003<sub>a</sub>: 18). It is hoped that such a system will facilitate the mobility of students amongst programmes and similar institutions. This provides further challenges for the higher education sector in the management of information.

#### **4.7 Information Challenges for Higher Education**

The extensive changes that have taken place in the last few decades in Ugandan higher education have broad ramifications not only for government and higher education managers but also for the workforce and the economy. Some of these changes in higher education have been characterised by the large increase in numbers of the nation's population seeking tertiary/higher education. This has led to increased enrolments in higher education. The increase in enrolments implies a need for managing information about students, and also the increasing numbers and greater demands for higher education.

##### **4.7.1 Support for Higher Education**

The Government of Uganda has for political and social reasons committed itself to accommodate the growing demand for higher education. Due to the increased enrolments, higher education operates with overcrowded and deteriorating physical facilities, inadequate staffing, poor storage facilities and shortages of instructional materials. Utilising existing resources without affecting the quality of and inequalities in the access to and utilisation of student information requires a strategy to establish the system needs and requirements for effective use of resources. In this era of widespread fiscal constraints, higher education faces the challenge to preserve and improve the quality of management and in particular the management of student information. The continued increase in student enrolment in the lower levels of education has intensified the demand for higher education, which

has got adverse effects on macroeconomic conditions and leads to increased competition for scarce public funds. This has reduced Government's capacity to support higher education, leading to a decrease in public expenditure here. This has in turn led to a decline in information management standards in higher education, which therefore requires strategies that will provide a framework for correcting this trend.

#### **4.7.2 Planning for Professional Development**

To foster professional development, it is important to produce graduates who are able to take on the challenges of society. Currently, it is not easy to link information about a student at various levels of education. Students in their post-primary education indicate their career plans and talents, but there seems to be no strategy seeking to address how students can link their future plans with their current needs. A country like Uganda requires a system that can recognise and certify competencies and skills in order to strengthen the relationship between academic education, vocational education and the employment sector. This is why it is important to coordinate student information in educational institutions with that in the employment sector. Such coordination will guide human resource planning, development and utilisation. However, there is no guideline on how to link a student's information held at an educational institution with the labour market, because it is not easy to identify who that student is. There is also no way to ascertain the kinds of qualifications of a particular person or the records of qualified candidates available in the country. This certainly demonstrates that higher education currently requires a major transformation regarding improved management and efficiency of systems and institutions to address such needs. This requires guidelines for the integration of higher education strategies into national development programmes. Kasozi (2003:33) in his book *University Education in Uganda* expressed this clearly: 'if we want good education, we must plan [for] it'.

#### **4.7.3 Utilisation of information**

The Government of Uganda for a long time has been responsible for the financing of educational institutions. It was also noted that the private sector has been credited for the substantial role it has played in the education sector. Local governments too have significantly contributed to the running of the educational institutions. Despite the existence of various bodies involved in the governance of these institutions, it is the responsibility of the Government to supervise their operations and to

ensure quality in education. Hence the Government requires a system to coordinate with the educational institutions that generate and keep the information. Other stakeholders also need to know what is taking place in the educational institutions. There are also many other interested parties that may require information about a student. For example, parents need information about their children's interests. This requires a strategy for all stakeholders to be involved in the provision of guidance for and support of a child's learning process. The various levels of the decentralised system also require information to be able to execute their duties. The products of the various levels require coordination. Regulations have not provided a framework for such coordination, nor how to integrate this into national development programmes. Since higher education is at the apex of education, successful students end up entering institutions of higher learning, which need to have information which will be useful to them.

#### **4.7.4 Educational management information system**

The Government recognises the importance of the central collection, compilation and publishing of education data annually without any time lags. Therefore an educational management information system (EMIS) aims at providing quality education statistics in a timely and cost-effective manner. EMIS is also intended to support selected operational functions at the national, district and school level. This has contributed significantly regarding the provision of statistics as an input for educational planning. The statistics have also enabled the Ministry to establish the status of institutions and also guide the Ministry in allocation of capitation grants, capital development and staff ceilings. It is important to utilise this opportunity for higher education to obtain information from the lower levels that supply it. A strategy to utilise the existing facilities at schools, districts and national levels in the Educational Management Information System (EMIS) is consequently required.

#### **4.7.5 Integration and coordination of Student Information**

It has been observed that most of the government plans have been concerned with the lack of coordination and supervision and a need to ensure standards in education. It has also been a government desire to enable transfer of students from one institution to another. The fact that higher education institutions are not coordinated makes it more difficult for them to allow exchange of student information between themselves. Currently, there is neither horizontal nor

vertical coordination amongst institutions at various levels of education. Although NCHE has been planning to institute a credit system, there is no strategy to allow the sharing and exchange of information between institutions and the employment sector. There is no clear system in Uganda that makes it possible to recognise qualifications obtained from various educational institutions. This requires the harmonisation of entrance requirements, adaptation of common terminology and evaluation criteria and effective utilisation of all resources available in the area. This is only possible if a strategy to coordinate such information is put in place. The implementation of a credit system requires proper identification of students, to be able to keep track of a student credit from one institution to another.

#### **4.7.6 Student Identification**

The mission of education is to enable all students/pupils to develop all their talents to the full, and realise their creative potential and achievements, but a lack of student information affects planning in the country and MoES in particular. The available information requires much verification before it is accepted. Verification requires the proper identification of an entity (student information). An identification strategy to facilitate coordination is lacking in the country. Although there are attempts towards identification strategies in other countries, higher education in Uganda needs to explore such strategies to draw out lessons for Uganda. The challenge is: how can higher education in Uganda integrate the strategic options available in those other countries into a SIMS development programme in the country?

#### **4.8 Conclusion**

The structures of the education system have placed higher education among the priority areas for development in the country. This has significantly influenced the restructuring and reforms in the education sector. There are different key players in the management of this sector in Uganda. Through its line and support services, the MoES has played a significant role in the coordination of student information with educational institutions and the employment sector to varying degrees of success. Some cases of coordination are evident in the use of Educational Management Information System (EMIS), that provides statistics on the education sector. These however, seemed to be dealing more with the facilities at schools than with information about tertiary students. Moreover, there seem to be no strategies to enable the MoES to provide reliable, up-to-date and accurate



information for planning. There are various functions performed by the MoES and its semi-autonomous organisations in an effort to coordinate services and processes in the country. However, there is a lack of a coordinating structure to keep track of a student's details in Uganda. For instance, the functions of inspection, career guidance, admissions and examinations at different levels of education have no unified system that can facilitate tracking information on a student. With the increasing number of student enrolments in higher education, there is a need to accurately keep track of them, which requires proper identification of an entity (student information). Chapter Five will discuss how higher education in Uganda can integrate the strategic options available in other countries to develop an integrated SIMS.

## CHAPTER FIVE

### DESIGN STRATEGY FOR AN INTEGRATED 'SIMS' FOR HIGHER EDUCATION

#### 5.1 Introduction

To meet the challenges of the modern information age, higher education systems all over the world are taking advantage of new techniques in managing information, particularly because of growing demand for higher education institutions to accommodate students from lower levels of education. In Chapter Four, the structure of the education system in Uganda was explained. The chapter also described the state of, and information management challenges for, higher education in that country. In the present chapter, a review of student information management systems (SIMS) for higher education in various countries is undertaken. In this chapter, efforts are made to establish SIMS features that can be explored to solve the information management challenges indicated in Chapter Four.

#### 5.2 A Strategy for information management challenges in Higher Education

The changes in global technological trends have fundamentally affected developments in higher education in developing countries. This is especially so when there are reforms and changes to be adopted in the design of new systems. The fact that most of the higher education institutions in developing countries and especially in African countries are based on the former colony's system of administration (Brett 1973:2), has affected them in adapting to change and reforms. Whereas the French colonial education policy, for example, aimed at bringing Africans up to European standards of civilisation through 'pure' French education (Rubenstein 1997:2), the British policy, on the other hand, employed indirect rule whereby the traditional social hierarchy was maintained and, sometimes, respected and integrated into the colonial administrative system (Nabudere 1982:43). In the British system, the philosophy was that of providing an education designed to integrate the 'individual' into the indigenous community, rather than into a European society. African higher education has to be seen in this context. The higher education institutions were first created as overseas colleges or official extensions of universities in Britain, France and Belgium. For example Makerere University in Uganda, the University College at Ibadan in Nigeria, and the Ghana University College at Lagon were all Colleges of the University of London (Musaaazi 1986:327). Most universities in Africa have not outgrown their roots in the colonialism that has caused higher

education in Africa to be viewed as separate from the community due to its inability to integrate itself into the socio-economic and political environment. This is why it is important to design a strategy to ensure that information systems (including student information management systems) designed for higher education are integrated into the socio-economic environment for which they are designed.

One of the main aims of higher education is to create, store and disseminate information that will enhance national development and its integration (Kasozi 2003:15) into the socio-economic environment. For effective integration, higher education institutions are faced with the task of managing of students' information as part of the challenges they face in setting-up strategies to guide their long-term organisational development plans (Geers 2000:17). In any situation, information systems are designed on the basis of the information to be captured, how it is to be used, and who may use it. Generally, the main functions of information systems at any level are dependent on the corresponding environment that facilitates data input and storage (manual or automated), and access (who accesses it, and how) (D'Elia, Rohde, Cogswell & Gorman 1991:140). The formulation of any strategy for such a system requires some analysis of other systems in operation to establish applicability for the Uganda environment.

Since the 1940s, many African countries have either tried to design systems to manage students' information, or to find ways of solving the problems they face in doing so (Guiton & Hall 1976:2 and Aina 1995:6). The challenge for African countries now is not to replicate the experiences of the developed countries but rather to learn from them how to enrich their own systems (Sawadago 1995:9). However, the main constraint for African higher education institutions is the inability to take the necessary action (Association for the Development of Education in Africa (ADEA) 2000:2). Not only are African countries faced with the task of developing frameworks and plans that work, but also with how to integrate the experiences of other countries into their own environment.

Different countries in the world have endeavoured to adopt and implement SIMS for higher education. These systems perform different functions, each with a specific purpose. The various SIMS can be explained in terms of an institution's and/or national information systems, as will be discussed in the sections that follow.

### **5.3 Institutional Student Information Systems**

Well-designed and managed student information systems at institutional levels affect the status of the educational system in any country. A number of higher education institutions in the world have embarked on programmes aimed broadly at improving the efficiency of the management of student information. Most of these student information systems are known to carry out administrative activities, including admissions, enrolment, and examinations (University of Tasmania 2001:1; University of New South Wales 2003:2; and Murdoch University 2003:1). Few of them offer coordination of information between different campuses like the University of Calgary (2000), University of Virginia (2001), Olympic College (2002), Brooklyn College (2002), the University of Rochester (2002), University of California San Diego (UCSD) (2002), Pennsylvania State University (2002), University of Hawaii (2003) and the Columbia State University (2003), among others. Below is a summary of the functions of a few selected examples of student information systems at individual institutions of higher learning discovered in an Internet search conducted between 2002 and 2004. The Key is given below the table.

**Table 5.1: Functions of the SIMS at institutional level**

Continent	Country	Institution	System	Functions												
				1	2	3	4	5	6	7	8	9	10	11	12	
Australia	Australia	University of New South Wales	SIS	F	F	F	F								F	
		Murdoch University	SIS	F	F	F	F									
		University of Western Australia	SRS	F	F	F	F									
		University of Melbourne	SIS	F	F	F	F						F			
Europe	UK	University of Leeds	ISS		F	F	F	F							F	
			SIMS	F	F	F	F	F	F			F				
			OSCAR		F	F		F							F	
			AAMS			F	F	F	F					F		
		University of Glasgow	SRS	F	F	F	F	F	F							
	Ravensbourne College	JISC			F	F		F								
	Belgium	Katholieke Universiteit	SMS			F		F							F	
Hungary	Debrecan University Network	CWIS	F	F	F		F									
North America	USA	Pennsylvania State University	ISIMS	F			F	F								
			EISIS		F	F										
		Olympic College	IS	F		F	F					F		F		
		University of California San Diego	ISIS	F	F	F	F	F	F						F	
		University of Hawaii	OASIS	F	F	F	F		F	F						
			DARS		F		F		F		F	F				
			ISIS	F	F			F				F				
			SAIS	F								F		F	F	
			SECE				F					F				
		SIS	F	F							F					
UH Manoa STS			F					F	F	F	F					

			ISWSIP	F	F	F			F					F
		University of Florida	MISS	F	F	F	F	F	F				F	
		Tulane University	SIMS	F	F	F	F	F	F					
		University of Texas	PEMIS	F	F	F	F	F	F	F	F	F		F
	Canada	University of Canada	SIMS		F	F	F	F				F		F
		University of Calgary	UCS	F	F	F	F	F	F	F	F		F	F
Africa	RSA	Stellenbosch	UIS	F	F	F	F		F				F	
	Tanzania	University of Dar es Salaam	APIS	F	F	F	F	F	F					F
	Mozambique	Eduardo Mondlane	IRIS	F	F	F	F	F	F				F	
	Uganda	Makerere University	ARIS	F	F	F	F							

**Source: Compiled from Institutional Websites by E Magara, 2004**

## Key

**F** indicates the function named in the columns 1 to 12 applies to the student information systems for the various universities in column three. The functions 1 to 12 represent the following:

- |  |  |
|--|--|
| 1. Administrative                          | 2. Academic Transaction Services             |
| 3. Student Academic History and Profile    | 4. Access, Queries and Inquiry               |
| 5. Data Warehousing and Storage            | 6. Networking and Resource Sharing           |
| 7. Standardisation                         | 8. Inter-Sectoral Linkages (e.g. Employment) |
| 9. Data Analysis, Statistics and Reporting | 10. Data Protection and Security             |
| 11. Keeping Track of Information           | 12. Identification of Information            |

## Abbreviations

AAMS: Athens Access Management System	APIS: Academic Program Information System
ARIS: Academic Registrar Information System	CWIS: Campus Wide Information System
DARS: Degree Audit Reporting System	EISIS: Electronic Integrated Student Information System
ISMIS: Integrated Student Management Information System	ISS: Information Systems and Services
ISWSIP: Integrated System Wide Student Information Project	MISS: Management Information System School
OASIS: On-line Access to Student Information System	
OSCAR: Online System for Computerised Administration and Research	
PEMIS: Public Education Information Management System	SAIS: Student Aid Information System
SECE: Student Employment and Co-operative Education	SIS: Students Information Systems
SIMS: Student Information Management System	SMS: School Management System
SRS: Students Records System	SRTS: Student Records Tracking System
UCS: University Classification System	UIS: University Information System

NOTE: The abbreviations are the names given to specific systems and do not indicate a type of system.

From the table it is clear that student information systems offer various functions, capture and maintain student data, and coordinate different levels of student information, as explained in the sub-sections below.

### 5.3.1 Functions of an institutional student information system

The functions performed by different systems differ from one system to another. It can be observed from the table that different systems at institutions of higher learning are intended for administrative and/or academic transaction services, and the maintaining of a student's academic history and

profile. Furthermore, most of the systems at the institutional level offer facilities for access, query and inquiry, and data warehousing. Systems that handle academic transaction services have the ability to update registration and student academic files, and deal with other administrative issues in institutions. Administrative functions involve course and student support, research, and financial management services, while academic transaction functions involve admission, registration, and examination services. Most of the administrative and academic transaction services provide input into student information systems in the institutions, and, in many systems, there are online access systems to offer enhanced services that allow enrolment or re-enrolment through the web. This is integrated into the student records system.

In some countries, attempts have been made to protect students' rights and the privacy of their information. There are also routine services in systems that provide data analysis and generate reports (ad hoc, batch, or snapshot) about student information. In some universities, there are systems to update, query and export students' information. In other institutions, systems offer academic information querying, an online address book, and coordination with any employment management information system in the country. Some universities, e.g. Leeds and Hawaii, have made attempts to track students' information regarding academic results, career path, and financial aid received where applicable. However, there are no generally accepted standards regarding what student information is kept at each institution.

### **5.3.2 Student information kept in educational institutions**

The type of student information kept does not significantly differ between institutions. However, the detail varies from institution to institution depending on the needs and requirements in the intended environment. Most of the institutions reviewed, keep and maintain student information, including but not limited to:

- Academic: admission data, courses attended, grades attained, dates of enrolment, schools attended, degrees awarded, academic honours and awards received.
- Alumni: personal, educational, and professional, contributions and gifts.
- Athletics: data containing intercollegiate participants.
- Conduct: disciplinary records, honour violations, law violations.
- Employment: student employment record and appointments, profiles, placement data, positions held, work records, résumés, and letters of recommendation.
- Extra-curricular: membership of organisations, offices held, honours and awards received, accomplishments, biographic data.
- Financial: financial aid data, charges, payments, and delinquent accounts.
- General: directory information, correspondence, biographic data.

- Recommendations: personal evaluations, academic evaluations, and employment evaluations

Some institutions of higher learning have made attempts to lay down standards for the identification of student information, however, none has a strategy for how to keep track of student information in the country. For example, both Texas A&M University (2002) and the University of Illinois (2003) at Chicago in the USA provide a Personal Identification Number (PIN) made up of the month, day and year of birth and social security number (SSN). For instance, if the birth date is June 26, 1973, the pin is initially 062673. The Social Security Number assigned before registration is appended to it. At Stanford University (2000), an electronic access code (EAC) (also known as a Personal Identification Number (PIN)), is required if one wants to access the departmental student systems.

There are various reasons for accessing such systems, such as to:

- file or renew a free application for Federal Student Aid (FAFSA) using the FAFSA on the web-site;
- use one's EAC to access the National Student Loan Data System (NSLDS) web-site and view information about federal aid, including student loans; or
- make address, phone number and college choice corrections to one's FAFSA data. (Stanford University 2000.)

Although the features of a PIN number seem to address the identification function, a strategy is still required to keep track of a student in the country as such a student can leave one institution for another. No recognised strategy to ensure coordination of such identification numbers between various educational institutions in place, as far as could be established

### **5.3.3 Coordination of student information between institutions**

Attempts have been made to design systems that coordinate student information between individual institutions. Much of this coordination deals with the day-to-day transactions within and between institutions. Some systems, like the Public Education Information Management System (PEIMS) developed by Texas Educational Agency (TEA) (2002), are able to coordinate records of students' attendance, and to edit and generate student information reports from the institutions of higher education in the state. In compliance with the Texas Education Code, PEIMS contains the data necessary for determining policy issues. PEIMS also encompasses all data requested and received by TEA concerning public education, including student demographic data and academic performance.

Furthermore, the Tulane University Student Information Management System, along with five collegiate partners and Oracle Corporation, have joined together to develop and implement a comprehensive student information management system in the USA (Tulane University 2001). The

functions include the keeping of records regarding registration, admission and financial aid received by students, as well as the processing of such actions.

To improve transaction functions in admissions, enrolment management and student support, attempts have been made to link higher education institutions with the secondary schools that supply students to them. For example, SIMS at the University of Maryland (2000), in Baltimore USA, empowers secondary schools with the ability to control their own data as students information is submitted to higher education institutions. Likewise, the Universities of Quebec and the Ministry of Post-Secondary Education and Science of the Quebec province, in Canada, have worked together for several years in the dissemination of information on various aspects of university life (Beaupre 1995:181). The university supplies data to a number of information systems so that the Ministry is able to make decisions. The information supplied by the university system includes a census of university users, an admission system, and employment information regarding graduates. The abilities of individual university systems to link institutions at lower and peer levels, and at national level, in various transaction functions such as admissions and employment systems constitute an important strategy that could be considered when designing systems for the intended environment. Such a design strategy should facilitate tracking of student information in different institutions that would form a national student information management system.

#### **5.4 National Student Information Management Systems**

National information management systems (SIMS) should provide the type of information, functions and services, which they are designed for to offer in the country. To design a strategy for a national SIMS, one requires an understanding of the principles under which integration of a system in a country functions. Various authorities including Elorrio (1977:17), Warner (1988:135), D'Elia, Rohde, Gogswell and Gorman (1991:139) and Boupha (1997:23) have shown that the principles for which a student information system is designed depend on the mission it has and the intended environment. Some of these principles include:

- The system must produce a strong multi-institutional endeavour – vigour at national level.
- The system should not only create new structures, but also contribute to the importance and development of existing ones.
- Efforts should be devoted to achieving greater integration and co-operation between the diverse governmental, private or institutional information needs.
- Though co-operative, the endeavour should be such as to improve the division of specialities between institutions.
- The system should be part of the national networks, thereby bringing direct and timely benefits



to the community, while using local information resources.

- It should be oriented to the users, taking into consideration their implicit and explicit information requirements.
- The system should by no means attempt to limit the institutional autonomy within the membership; rather its essential purpose should be to encourage the initiatives and efforts of those bodies and entities of which it is composed.
- The system should also involve the acquisition and importing of information from external sources to provide services.
- Through the system's communication channels, which comprise network structures, information should flow to enable decision-making. The system should also be based on substantial bases of data, both national and local.

From the above principles, it can be observed that for student information systems to cater for the capture, management and use of student information in a country, a coordinating structure at the national level is required. The central planning process at the national level should be able to link with other sector systems, like the employment sector and its associated agencies (Ryder 1996:55). For example, the situation of British higher education is best described by David Granick who wrote that 'the state pays the piper and so it picks the tune in deciding how many majors there will be within each department in each college' (Granick (1960:64) as quoted by (Ryder 1996:55). Systems at national level also require standards in terms of data to be captured, and harmonised activities to be performed on the student information. In order to keep track of student information, a system for identification of students is required to facilitate its integration into the national development programmes. The succeeding subsections will describe coordination strategies, standardisation, and identification of student information.

#### **5.4.1 Coordination Strategies**

Coordination involves the ability of systems to access, exchange and share information among themselves. This requires well articulated needs and system requirements (Wilson, Ma Carte, Mc Kay & Estime 1988:118), some of which (Penrod and Witte 1988:119; Wilson et al. 1988:119; Simon 1998:25) are characterised by the following design features:

- Centralised management at policy level of all information processes (data processing, telecommunications, office automation, and research computing);
- A nation-wide communication network, integrating voice, data, and possibly image traffic with bridges to outside networks;
- Subject database organised relationally to allow easy access and manipulation by users;
- An application architecture, which integrates current diverse information systems and specifies the possible functions of future systems;
- A hardware architecture consisting of mainframe computers, microcomputers, intelligent

workstations and specialised devices;

- Internal management systems that allow for effective management of the utility and network;
- Decentralised technologies used with decentralised management in a centralised structure of the entire system. This is to ensure standardised applications and enable full accessibility of information. However, this requires database management, a communication network, systems development, procedures, and systems security;
- A combination of technologies: the system will require integrating different technologies including intelligent workstations, advanced workstations, microcomputers, the host mainframe, a possibility of access to supercomputers, integrated voice/data communication facilities, local area networks, and wide transmission systems;
- School (institution) specific, division specific and program specific applications resident on microcomputers;
- Personal applications resident on individual workstations; and
- A central communications switch that allows users to access those technologies and data appropriate to their needs with agreed-upon security provisions.

From the above requirements, it is clear that any implementation of a SIMS requires a structure that provides access to and use of information. Authorised users should have the ability to access any application and all databases within the structure of an information system (Wilson et al. 1988:119). The structure should allow more functionality for all such users of the system (University of Tasmania 2001:1). This means that student information needs to be stored, processed, and retrieved and accessed by authorised users. The National Autonomous University of Mexico for example provides a coordinating structure for student information at the University (Guerra 1997:1). Also, the University of Minnesota Twin City Campus USA possesses an Integrated Information Centre (IIC) for coordinating both academic computing and administrative information services (Branin & Finn 1991:137).

An integrated system demands that it be widely shared and that its goals and objectives are clearly focused (D'Elia & Lunin 1991:118). This means such a system should have the ability to collect, store, allow retrieval, and enable effective use of information. The integration of a SIMS needs to link one or more networks across institutional lines in the country (Broering, Feng & Matheson 1988:132). An integrated SIMS requires electronic information sharing between institutions. In the USA, for example, electronic information sharing through an integrated academic information management system (IAIMS) health science network is facilitated by databanks at other academic medical centres. The IAIMS project at the University of Utah USA has focused on clinical linkages to facilitate research, teaching, and the service mission of the Medical Centre.

In order to keep track of student information in any environment, it is necessary to provide facilities to establish linkages and procedures necessary for the integration of the system. This requires a medium through which student information is captured — an information system. For example, both the University of Minnesota and the Hubert H. Humphrey Institute of Public Affairs have in place a system that coordinates people, information, hardware and software, and procedures in the management of student information (D’Elia & Lunin 1991:118; Straub & Beath 1991:128; Collins & Straub 1991:122). Coordination is also required in a networked environment and distributed system to enable the organisation of data, extraction of information, development of ideas, and evaluation of actions (Wilson et al. 1988:113). The role of a coordinating system is to ensure that other systems are able to integrate their data. A coordination system (Wilson et al. 1988:113) therefore should be responsible for:

- provision of leadership and guidance to schools;
- planning and coordinating support for the development and distribution of information resources;
- formulation and administration of policies and procedures for management of information resources;
- promotion of education policies to improve collection, validation, and reporting of timely and reliable data on the education system
- Defining the state-wide Student Tracking System (STS).
- directing and coordinating the planning and management of systems for the institutions; and
- advising on the collegial governance mechanisms in the universities.

The coordinating system should therefore play a coordinating role to enable a national information system to perform its intended functions. The national information systems, for example the State-wide Information Management System of the Massachusetts Department of Education (2001) and The National Centre for Education Statistics (NCES) of the Directorate of Information Systems (2003) in South Africa possess various coordinated systems whose functions may be summarised as below:

**a) Capturing data about student information.** Many of the national information systems capture data about a students in a country. For example in South Africa, the Higher Education Management Information System (HEMIS) captures data, which includes qualification type, minimum formal time, total credits, major fields of study, major areas of specialisation and total credits gained for distinct instructional offerings. The system also captures a student’s personal characteristics such as racial/ ethnic identification.

**b) Coordination of student information in various institutions.** Coordination of student information should ensure data collection activities at all levels of education in a country, and the updating and integration of national student databases with related databases, including the census data and personal data. For example, HEMIS coordinates student information in universities and other post-secondary colleges.

**c) Analysis and reporting of students' information.** The collected data should be analysed and important information relating to various functions in the country must be reported to relevant users. Systems should ensure accurate student information reporting to the public, and to local and international agencies. For example, HEMIS in South Africa was designed to provide statistical analyses of students in South Africa.

**d) Tracking and verification of students' information.** The system tracks application and entrance categories, and transfers of students according to the last higher education institution attended. Keeping track of students' information for purposes of certification is one function that is crucial for national systems. For example, STS of the Massachusetts Department of Education (2001) offers the educator a certification and tracking system, and an online transaction system for higher education in Massachusetts.

Although there have been attempts at coordination in some countries, a lack of agreed standards for data formats and activities has limited their effectiveness. For example, in South Africa, there have been reports that it is in some cases it is difficult to maintain, store, and access data from various university systems. There are also difficulties in accessing and manipulating the data and some cases of redundant data that are never used (South Africa. Department of Education 1999). Standardisation of activities and data formats in the system is therefore required to facilitate better coordination of student information in a country.

#### **5.4.2 Standardisation of Student Information Systems**

The divergences in the form in which student information is captured and kept in different institutions of higher learning, limit coordination of that information. There are various attempts to ensure standardisation and harmonisation of the operations and services provided for the management of student information in different parts of the world. For example, in the United States,

there is a standard regulating which information is kept about a student. According to the US Code (20 USC 123g), 'student information' comprises that information maintained in schools in any recorded way, such as handwriting, print, computer media, video or audiotape, film, microfilm, and microfiche (National Centre for Educational Statistics 1997:2). According to this regulation, Section 123 (g) defines information kept about a student as '...information contained in an education record of a student which would not be considered harmful or an invasion of privacy if disclosed' (National Centre for Education Statistics 1997:2). This information includes but is not limited to:

- Date and place of birth, parent(s)' and/or guardian's address, and where the parents can be contacted in emergencies;
- Grades, courses taken, academic specialisation, official letters regarding a student's status in school;
- Special education records;
- Disciplinary records;
- Medical and health records that the school creates or collects and maintains;
- Documentation of attendance, schools attended, courses taken, awards conferred, and degrees earned;
- Personal information such as a student's identification code, social security number, picture or other information that would make it easy to identify or locate a student.

It also includes data on participation in officially recognised activities and sports, height and weight of members of athletic teams, dates of attendance, degrees and other awards received, and the immediate recent and previous educational agency or institution attended (Hyman 1982:155; Van Tol 1988:119). Implications for institutions are that the post-secondary communities have to work together to develop standards, and enhance communication between them: For example, the American Association of Collegiate Registrars and Admission Officers (AACRAO) has been involved in ensuring standards in the country. AACRAO is a member of the Statistical Networking Applications Project (SNAP) that is involved in the Standardisation of Post-secondary Education Electronic Data Exchange (SPEEDE) and the exchange of permanent records, electronically, for students and schools (ExPress) at the elementary-secondary level. ExPress keeps transaction sets of student records, applications for admission, verification of enrolment, and test scores. Similarly, in South Africa, the Higher Education Management Information System (HEMIS) keeps details about student information including a student's date of birth, gender, racial identification (not to be reported), citizenship, home language, country of permanent home address, predominant activity in the previous year code, aggregate symbol, type of last higher education attended, qualification requirements, fulfilment status, and existing qualification status (South Africa. Department of Education 1999:11).

### 5.4.3 Student Identification Systems

A student identification system for a country requires a national identification system. The development of a national identification system to identify each citizen in a country requires long and careful deliberation and experimentation (Ross 2001). The identification of people was recognised as far back as the birth of Jesus Christ, when Quirinius who was Governor of Syria conducted a census (Bible. New Testament. Luke 2:1). In those days, Caesar Augustus issued a decree that a census should be conducted in the entire Roman World. The census was intended to provide statistics regarding the citizens. Many countries, including Uganda, have followed this trend of carrying out periodic censuses, but few such censuses attempt to identify the citizens in the country individually. A well-designed national identification system would facilitate the design of a national *student* information system. A strategy would be required to integrate such a system into the national development programmes in the environment intended.

Attempts have been made in the USA (Massachusetts Department of Education 2001; Musser & Ruller 2004), England (Assister & Shaw 1993:1; Jones 1993:41), and Canada (Statistics Canada 2003) to design and use a state-wide student identification system for the purposes of collecting information, providing a profile and generating statistics about students. For example, in Canada, there has been an attempt at coordinating student information in the country, through development of the Enhanced Student Information System (ESIS) by Statistics Canada (2003), that has confronted higher education institutions with many challenges. To ensure coordination in the country, a national student number (NSN) is assigned to each student in an institution—ESIS-NSN. The ESIS-NSN makes it possible to link the information that institutions submit each year with the student information already held on the national database. To do so, post-secondary institutions are required to create and keep on record, the ESIS-NSN for each student enrolled at their institution (Statistics Canada 2003). Once transmitted and stored on the ESIS database, Statistics Canada is able to keep track of the student's mobility and pathways in Canadian post-secondary institutions.

Currently, ESIS-NSN aims at linking student records within a national database (Statistics Canada 2003), but students do not use the ESIS-NSN to register at the university where they study. This number is only used for statistical purposes at the national level (Statistics Canada 2003). Further, it is only Statistics Canada that will have a complete and comprehensive ESIS-NSN file of all the students in the country. However, institutions collect and provide information about students to

Statistics Canada. The information provided includes: student's name, social insurance number, contact information (address and telephone number), demographic characteristics, enrolment information, previous education, and labour force activity.

The ability of an ESIS-NSN to keep track of student mobility is an important feature of an integrated SIMS for higher education. A strategy to integrate such a system into any country's higher education environment and sustain it is necessary.

## **5.5 System Sustainability**

The introduction of a system into any environment requires sustainable strategies as a priority (Ricks 2001:5). The application of the system requires strategies for education and training, funding, a management structure, political will, and legal and policy guidelines, as discussed in the subsections that follow.

### **5.5.1 Education and Training**

Awareness, sensitisation and training require much attention in any design of a SIMS strategy. The aim of education and training includes the development of an ability to use information for decision-making. To acquire such an ability, stakeholders need to be made aware by providing effective information services between and within organisations. Describing the information requirements of the Humphrey Institute of Public Affairs (University of Minnesota), D'Elia, Rohde, Gogswell and Gorman (1991:142) noted that when providing information services to the university community, there is a need to assist staff in integrating their information requirements so as to achieve the promise of increased productivity. An appropriate strategy to assist staff in the environment is needed. Hanson and Court (1998:9) suggest that organisations create a conducive learning environment in the system [a SIMS in this case] and organisational culture in order to allow development to take place. Like Blackler and Kennedy (2004:197), Hanson and Court (1998:9) assert that in a supportive environment, people can take risks; make mistakes, and jointly celebrate success. Blackler and Kennedy (2004:197), reporting on experiences in leadership programmes for experienced chief executives from the public sector in Britain, maintain that an appropriately designed learning programme would help to resolve and manage commitment and change (Blackler & Kennedy 2004:197).

To develop a learning environment for SIMS, higher education institutions need proper identification of competencies in the existing workforce in order to foster effective skills, lead to successful performance and ensure an effective leadership role. Higher education institutions should therefore aim at creating sustainable learning environments for their workforce as King (1996:30) noted: ‘the more the training environment represents the work environment, the higher the chance of their learners transferring their newly offered skills and knowledge to the job’. Many authors like Raudette (1996:15), Larson and Lockee (2004:22) and Sleezer and Denney (2004:41) suggest strategies for developing career environments and highly skilled workers to manage the climate of change. In fact Sleezer and Denny (2004:41) believe that both human performance improvement and human resource development have a significant bearing on the success of any system. This is why they recommend to organisations (including higher education institutions) that they should create a workforce development infrastructure to develop a capacity for performance improvement requirements and to ensure sustainability in managing change. To manage change in any system requires a suitable strategy.

### **5.5.2 Funding**

*The expansion of universities is one marked feature of the social life in the present age. All countries have shared this moment...it is however possible to be overwhelmed even by gifts of good fortune...(Ramsden 1998:347).*

Referring to Alfred North Whitehead, a mathematician and a great writer on science education, who uttered these words in 1928 at the opening of the Harvard Business School, Ramsden (1998) observes the immense costs involved in the management of higher education and calls for an enterprising strategy by higher education institutions. Explaining the challenges of higher education in Russia, Ukraine, and the European Union, for example, Hare (1997:3) noted that, ‘one of the effects of budgetary stringency has been enhanced public concern over what universities actually do’. According to Hare, there is a need to devise ways of holding key staff in place, and developing appropriate links for the sustainability of university functions including management of student information. Hence it is important to design strategies for funding of any system. There are several sources of funding for a system to manage student information in higher education. For example, at the Humphrey Institute, the major sources of income include the university’s central administration, the unit budget, funds from internal and external individuals, etc. (Adams, Beath, Balan, Branin, D’Elia, Rhode & Straub 1991:149). It is therefore important that strategic plans be developed to



provide a basis for accountability and performance against stated intentions (Coaldrake 1996:4). This requires institutions to match the defined requirements with the available funding avenues (Simon 1998:25). The German higher education system, for instance, utilises students' fees to support various programmes (Winkler 1997:122). In fact, the Eastern and Southern African Universities Research Programme (1994) seems to recommend a diversification of revenue for tertiary education in implementing institutional programmes. This includes cost recovery measures, and creation of educational funds for programmes, which require involvement and accountability, governance, links and publicity within the system. A design strategy is therefore required.

Through its Department of National Education, the South African Government initiates and takes the necessary steps to create an enabling environment for the establishment of higher education funding programmes (Association for the Development of Education in Africa 2000:4). The funding provided by the government aims at ensuring education quality, supporting university structures and fostering strategic planning. In South Africa, funding agencies provide inputs for development of a coordinated university information development plan. They also support institutional linkages, and develop and support management training for the sustainability of the management of student information in the country ((Association for the Development of Education in Africa 2000:4). Funding strategies needs to take account of the requirements of a particular environment.

### 5.5.3 Management Structure

Management plays a crucial role in determining the success or failure of any SIMS. Groups and individuals with different responsibilities contribute to the success of any SIMS (Simon 1998:21). This requires a management structure to provide proper supervision and evaluation of a SIMS in the country. This structure facilitates the coordination of efforts, suggesting priorities for action, and proposing studies in regard to better organisation of activities and services, and collaborates in the identification of policies and actions (Elorrio 1977:18). For example, in the USA, at the University of Baltimore, the Academic Health Services Centre has an Information Resource Management (IRM) Advisory Committee. The purpose of the committee is to deal with the academic computing advisory services in the university, that make recommendations to the policy committee, and facilitate joint plans and ventures (Feng & Weise 1988:128). The joint ventures can be facilitated by a Local Area Network, a faculty database, and inter-institutional sharing of information (Feng & Weise 1988:129). In some countries, a national council (together with provincial centre committees) is utilised to facilitate coordination of information (Elorrio 1977:18). The names of committees vary according to the functions performed, e.g. steering committees, non-technical committees, and working groups (Elorrio 1977:18; Simon 1998:21). At the University of Warwick (2003), in the UK, there is in place an Earned Income Group, and Strategy Committee that oversee the implementation of resource allocation. This requires a strategy to develop managers that are ready to advocate for promotion and sustaining a system in the country (Simon 1998:22).

The National Plan for Higher Education in South Africa (2003) provides a framework and mechanism for the restructuring of the higher education system to achieve the vision and goals for its transformation (SA 2003). The regulatory developments stemming from a range of other state departments and parastatals in the country include the National Qualifications Framework (NQF), which provides the quality assurance mechanism established by South Africa Qualification Authority (SAQA). In order to achieve quality assurance, higher education institutions are required to develop student information systems that enable access, and provide timely and reliable information (ADEA 2001). The creation of a Higher Education Branch in the Department of Education, establishing SAQA, the founding of the NCHE, the Education Act and the Education White Paper have significantly provided a strategy for the management of SIMS for higher education (ADEA 2000:2). This strategy may furnish ideas for a SIMS in Uganda.

#### 5.5.4 Political Will

Political thinking in any country affects the socio-economic development there (Balunywa 1996:72). Various governments have used a number of policy regimes in the management and sustainability of higher education strategies, which in turn affect any student information system. Visser ([Sa]: 53) explains the driving forces for the transformation of higher education in South Africa as including the changing society's concerns and attitudes, government policy changes and the use of technology in higher education, and the increasing globalisation of the industry as the major forces in the implementation of higher education systems. To address the reforms of higher education, a review of countries' experiences by the World Bank (1994:26) identifies four key directions for reform in management of systems (including information systems) that can help a country achieve these goals:

- Encouraging greater differentiation of institutions;
- Providing incentives for public institutions to diversify sources of funding including cost sharing with students and linking government funding to performance;
- Re-defining the role of government in higher education; and
- Introducing policies explicitly designed to give priority to quality and equity objectives.

To attain such goals, a country requires sustainable policies regarding management of students' information.

#### 5.5.5 Legal and Policy Issues of an Integrated SIMS

The ability to collect, store and retrieve information has magnified its potential misuse (Rees, Rhode & Bolan 1991:132). In the academic computing environment, the philosophy of allowing open access has significantly made student information vulnerable to a number of consequences. In administrative computing, restriction of access to particular information is therefore implicit (Magadance 1997:29; Memorial University of Newfoundland 1998:33).

In most educational institutions, there is normally a specific office responsible for the identification of student information. Most higher education institutions place the responsibility for data ownership and electronic access to the data on information managers (Magadance 1997:29). In most cases, the office of the Registrar is responsible for the administrative and paper-version information systems (Magadance 1997:29). This office is responsible for safeguarding access, authorising access, educating users, determining minimum standards of security and ensuring compliance with local, state or federal guidelines (Magadance 1997:29). In the USA, the Department of Education provides a federal register of a family's educational rights and stipulates privacy regulations regarding the

categories of agencies to which the regulations apply, the purpose of the regulations, the rights of parents and students, what information should be kept and the annual notification about a student (USA. Department of Education 1988:99; Van Tol 1988:120-122; Schatken 1988:125-153).

An effective SIMS requires strategies for access to and use of students' information (consent and procedures), data security, and certification and verification strategies.

### **a) Access to and Use of Student Information**

Various countries have formulated policies on access to student information, with varying degrees of success. In Canada, students who do not wish to have their information used can ask Statistics Canada (2003) to remove their identity information from the national database. Similarly, the University of Victoria (1999) in Canada collects personal information pursuant to the University Act, RSBC 1996, Chapter 468, and Section 26 of the Freedom of Information and Protection of Privacy Act.

The following are the strategies for protecting access to student information (University of Victoria 1999):

- The information should be used for purposes of admission, registration, and other activities of the university including alumni and research.
- Personal information may not be released to anyone except as provided in the Freedom of Information and Protection of Privacy Act.
- University employees and faculty members are allowed access to students' academic records only in the pursuit of their duties.
- Personal information requested on application forms for admission and re-registration is used only for purposes of identifying names, student number, personal education number, birth date, socio-insurance number, citizenship and immigration status, date of entry into Canada, mailing address, previous education and referees.

In the USA, attempts to provide protection have been realised at the institutional level. The University of Illinois (2002) at Urbana-Champaign, for example, provides a code of policies and regulations applying to all students. The policy urges the university and its subdivisions to have a carefully considered policy on which information should be part of a student's permanent educational record and which should state the conditions of disclosure. It also urges the university to separate academic records from disciplinary ones. It guarantees the students access to their personal records. The administration is also urged by this code to ensure that transcripts of academic records

contain only information about academic status and conditions relating to the student's eligibility for continuing registration on the campus.

The University of Florida (2000) ensures confidentiality of student educational records in accordance with the State University System rules, state statutes, and the Family Educational Rights and Privacy Act of 1974 or Title 34, Part 99 of the *Code of Federal Regulations*. According to the code, students do not have access to personal notes containing administrative information. A student's educational record, for example, will not be transmitted to third parties outside the university without the student's written consent. The following exceptions to this code obtain:

- This information (referred to as public information) will be released to anyone who needs it. Public information includes the student's name, current local/permanent address and email address, telephone listing, academic major, dates of attendance, awards received, participation in officially recognised activities and sports, and the height and weight of athletic team members.
- Information released to university officials with a legitimate educational interest.
- Information required by federal or state agencies as specifically provided for by law.
- Information released in compliance with a lawful subpoena.

Access to student information is protected by the Family Educational Rights and Privacy Act (FERPA), 1994. According to this Act, the rights of students with respect to educational records include:

- The right to inspect and review the student's education record within 45 days of the day the university receives a request for access;
- The right to request the amendment of the student's education records if the student believes they are inaccurate or missing; and
- The right to consent to disclosures of personally identifiable information contained in the student's educational records.

According to the FERPA if a student's information is to be released, the parents' consent must be signed and dated (National Centre for Educational Statistics 1997:3). The consent must:

- Specify the records that will be released;
- State the reason for releasing the records; and
- Identify the groups or individuals that will receive the records.

At the University of Florida (2003), students are given full and fair opportunity to present evidence to show that their records contain inaccurate, misleading, or otherwise inappropriate information;

and to facilitate the provision of prompt information. The review of records is made in the presence of a university official.

### **b) Data Security and Protection**

With the increased use of student information in a networked environment, there is a need for a strategy for protecting data and information in any environment in which it is used. In this regard, a number of strategies to implement a broad array of security measures at multiple locations throughout a system's architecture are employed. Stardata Technologies (2003), for example, offers possible security strategies, e.g. physical security, perimeter defence, data encryption, user authentication, application security, internal system security, operating system security, database security, reliability and backup security. Security strategies should also address system standards, protect against physical access, and provide software security, access and audit procedures, backup protection and disaster recovery in management of student information (Magadance 1997:32). This requires a disaster development plan to ensure effective preservation and conservation of student information in a country. The University of California — Santa Barbara, for example, provides a blueprint for a record development plan that can be used by higher education in safeguarding student records. Their records development plan caters for management facilities and personnel safety and includes a technical profile, a records inventory, recovery procedures, and a policy regarding review and maintenance of records (Johns & Wheeler 1997:185).

### **c) Certification and Verification**

To attest to or verify a certain fact, in particular a record of information regarding a student's birth, marriage, death, or a university-accredited certificate and ownership of such a certificate, a high level of reliability and transparency is required. This requires acceptable morals and commitment to ethical obligations when offering education services in a given society (Guzman 1997), in particular to verify student information. In British universities for example, it remains the responsibility of the university officials to review a student's educational credentials from other countries. These normally include official and educational credentials, establishing the authenticity of documents, translations of credentials, and procedures for reviewing foreign credentials (Frey & Warren 1997:109). This requires a strategy to provide for the verification and certification of a student's information in the environment for which it is intended.

A national verification and certification system has been endorsed by bodies responsible for the management of student information in a number of countries. In the USA, there are prestigious associations like the American Association of University Professors (AAUP), the National Education Association (NEA), and the American Association of Collegiate Registrars and Admission Officers (AACRAO). These bodies regularly publish a code of ethics to follow when managing student information. Accordingly, ethical principles, among others, have been at the forefront of student information management. These ethics are related to admission fraud, admission related research, enrolment deception, non discrimination towards former students, release of information, age discrimination, clerical errors, confidentiality of medical records, serious disciplinary problems, revocation of academic awards, privacy rights, and access to information after a student's death (Fry 1997:42; Quann & Birnbaum 1997:1-17). Certification and verification of students' information goes beyond academic information. The American Association of Collegiate Registrars and Admission Officers (AACRAO), for example, provides for certification of academic eligibility for athletic participation (Demitroff & McNabb 1997:22). It is also the aim of AACRAO to ensure verification of foreign education credentials (Frey & Warren 1997:110).

Efforts have also been made in British higher education regarding access to and use of student information. A number of bodies have facilitated links with respect to student information, which include the Braintrack University Index, the Credit Accumulation and Transfer System, the Campus Connect, and the Higher Education Statistics Agency (Higher Education Links 2003). The certification and verification principles are important issues to consider in the design of a SIMS for higher education, for example, to ensure recognition of a qualification in Britain. This is more important in a diverse education system that requires recognition of individual qualifications, cross border mobility and diversity within and outside the country. A strategy to ensure reliability and transparency in verifying and certifying student information in the institutions of higher learning in a country is therefore required.

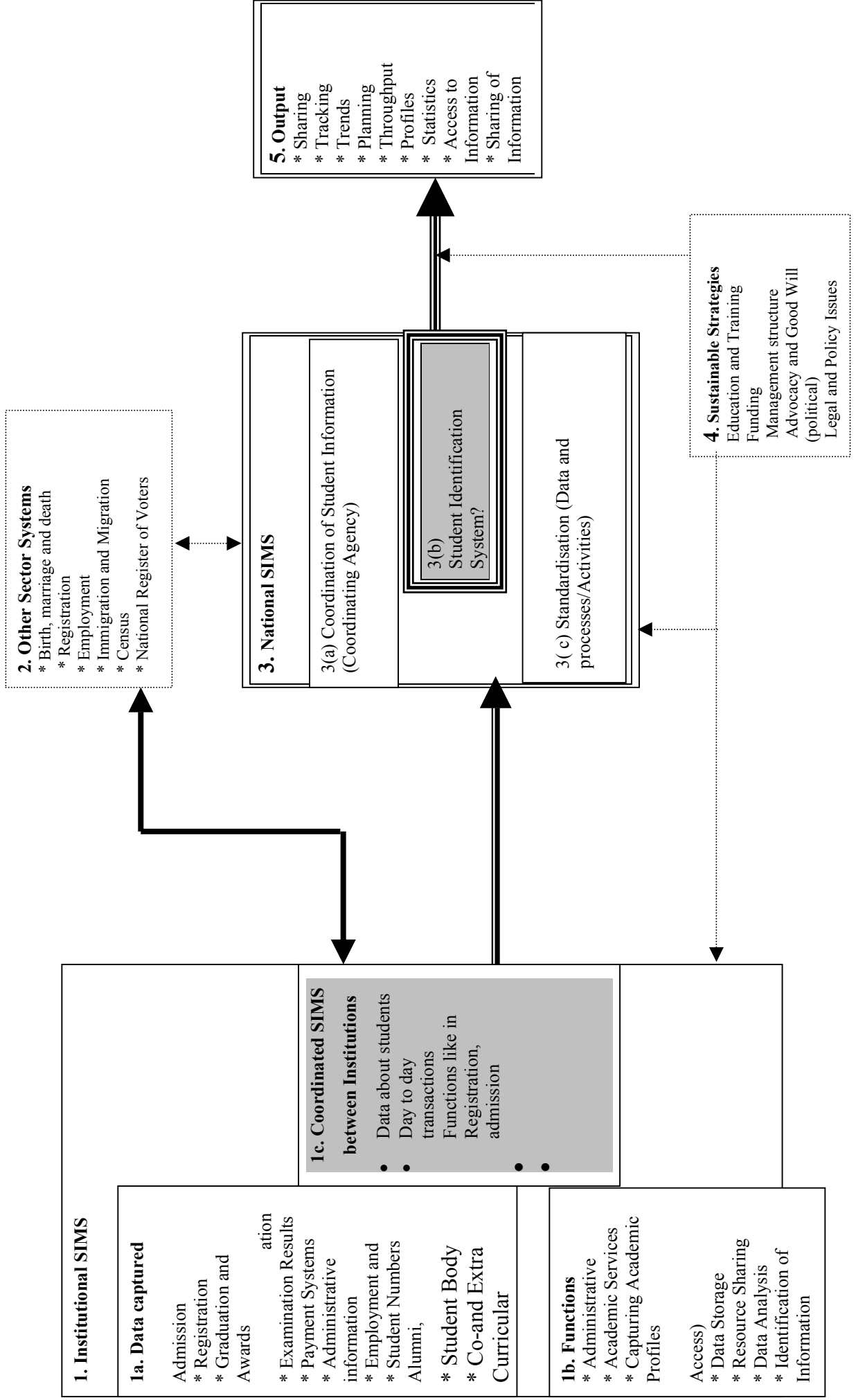
## **5.6 The SIMS Challenge**

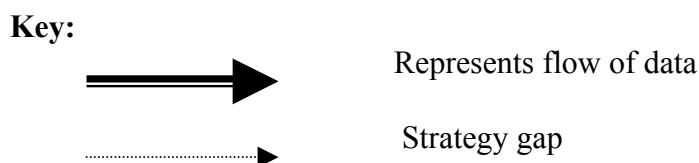
Despite the importance of national strategies for an effective SIMS in higher education, in a number of countries, their SIMS has been based mainly on the functions needed by educational institutions. In this era of diversification and decentralisation of services in most African countries, the multi-dimensional approach to student information requires well-defined system needs and services. Systems' and users' needs and requirements need to be established in the design of a SIMS, as will be explained in Chapter Seven. However, the most outstanding problem is that many of the systems that exist do not provide facilities for the coordination of student information. Systems do not employ a standard method by which student information can be captured, processed, and disseminated in a country. The standards available have been developed to regulate communication, usually with little emphasis on access to and utilisation of the student information. A few attempts made in the identification of student information, e.g. North America, are based on the individual university's needs. Few of them keep track of student information on a broader scale in the country, and no generally agreed-upon strategy for the integration of student information into a higher education environment in any country is available as far as is known. This is why this study proposes a student identification system that facilitates the integration of a SIMS for higher education in Uganda.

To emphasise this point, it can be observed that a well-designed SIMS at institutional level will contribute to the effectiveness of a national SIMS. SIMS can be developed in-house by institutions or acquired as commercial software packages. An institutional system is set for particular functions, to capture and keep student information in order to serve that particular institution, although some institutions do coordinate student information between various campuses in a country. A national SIMS, on the other hand, aims at the tracking of student information, analysing trends and assessing throughput, providing help in planning, providing profiles and statistics about students and enabling access to student information. In view of the principle of a centralised management and decentralised service with interlinkages to other sector systems, a national SIMS requires strategies for the coordination, standardisation, and identification of student information. Proper identification of this student information facilitates its integration into the socio-economic environment, and hence calls for a strategy for its integration into the environment. It is also important to design strategies for the sustainability of such a system including education, funding, management structure, political will and policy guidelines. Figure 5.1 summarises the features of an integrated SIMS for higher education and indicates a gap.



**Figure 5.1: Features of an Integrated SIMS for Higher Education**





### Explanation of Figure 5.1 above

The institutional student information system (Box number 1 in the figure above), as observed in section 5.3, captures and stores data about a student. Box number 1a shows the data captured at various institutional levels, for various functions (Box number 1b). One of the major functions of an institutional information system is coordination of student information within and outside the institution (Box number 1c). The coordination carried out at institutional level is used for day-to-day transactions between individual institutions and national systems. Some of the individual university systems possess abilities to link institutions at lower and peer levels, and at national level, in various transaction functions and also to link with systems from other sectors such as employment, or registration of birth, marriage and death records. Box 2 shows various systems with which individual systems can coordinate.

The national student information systems (Box 3) use student data captured at educational institutions (i.e. from Box number 1). For proper coordination of student information they also link with a number of other sector systems (Box number 2). This requires coordination strategies between systems in the country (Box 3a). Standards are also maintained by national information systems to ensure effective coordination of student information (Box 3c). In order to integrate the systems with the environment, national systems require a national identification system (Box number 3b). This will enable such a system to produce an output as indicated in Box 5.

To achieve the expected output (the purpose of a system), sustainable strategies (Box 4) need to be developed in the design of a national information management system. Note that Box 4 is not attached to the rest of the system, as it is an external factor that exerts an influence on the SIMS for higher education as a whole. The question mark (?) in Box number 3b indicates the problem to be investigated in this study. The main problem is to develop a strategy for how an identification system (in Box 3a) can be integrated into higher education development programmes in the intended environment (Uganda). The dotted lines originating from Box 4 indicate the strategy gap that requires a framework for an integrated SIMS for higher education to be designed.

## 5.7 Applicability to Uganda

To achieve the modernisation envisaged in Vision 2025, the country needs to be committed to the development of frameworks and policies for the coordination of information. The systems reviewed in this chapter demonstrate that many countries have attempted to establish a system to track students' information in their countries. However, in most of these countries where such systems are used they are university systems based on the strategic plans of specific universities. The existing SIMS in some countries do not track a specific student's information in a country.

The systems in the UK, the USA, and Canada, for example, stress access to and use of students' information by various higher education agencies. Although these systems provide various features that can be considered by other countries, such as Uganda, each country needs to identify its own requirements and resources before introducing new ideas and programmes.

Uganda therefore needs to study the current state of coordination of student information in the country, as will be explained in Chapter Six, to be able to learn from the experiences of other countries. In Uganda, the requirements and resources of institutions like MoES, UNEB, NCHE, universities and other tertiary institutions, and schools need to be established in relation to the features provided by various systems and programmes in other countries, in order to justify any effort to adopt the experiences of other countries.

It is important for a country like Uganda to establish which activities and data should be harmonised and to focus on the expectations for and likely results that can be produced by a SIMS. This is possible if the socio-economic feasibility of establishing a system on the basis of benefits derived from the experiences of other countries can be justified.

The capture and coordination of student information in any country requires a suitable framework. In any country with a diversity of forms in which student information is captured and kept, a design strategy for such a framework is consequently required. The literature study, however, identified no single blueprint from any country that can be adopted wholesale for use in the management of student information in Uganda.

While there have been attempts at student identification in Britain, the USA, and Canada, the emphasis

has been on the capture of information and the performance of higher education institutions. The systems reviewed above have been developed on the basis of environments, quite different from Uganda. This study has drawn on experiences elsewhere, to establish how one can design an integrated SIMS for higher education in Uganda. Reviews of these experiences show clear differences in the way student information is captured, kept, managed and coordinated. Some of the information that seems to be relevant and useful for higher education has been utilised in the design of an integrated SIMS for Uganda. The present study provides design criteria that are applicable in this country. It suggests a strategy for how a student identification system can facilitate the coordination of student information in Uganda. Strategies for the effective implementation of the framework for an integrated SIMS are also proposed.

## **5.8 Conclusion**

This chapter provides a review of SIMS design strategies. Various higher education institutions have attempted to develop, design and implement SIMS. Most of these attempts have been designed to meet the administrative and academic transaction functions of particular institutions only. Some countries have attempted to design national student information systems, but these attempts have mostly been focused on the tracking of a student in the same institution, with little emphasis on integration of this information into the national development programmes and environment. In the next chapter (Chapter Six), the state of the management and coordination of student information in Uganda is discussed. The researcher establishes the country's information needs and requirements (in Chapter Seven) so as to justify the design of an integrated SIMS for higher education in Uganda.

## CHAPTER SIX

### THE STATE OF THE MANAGEMENT AND COORDINATION OF STUDENT INFORMATION IN UGANDA

#### 6.1 Introduction

The key question this empirical study set out to investigate was to establish the state of the management and coordination of student information in Uganda. Employing a qualitative research design, a phenomenological approach was applied by means of questionnaires administered to administrative staff and students, interviews with key informants, focus groups, and observation and document analysis. The results were analysed and reported as per each sub-question of the main research question. This chapter gives an overview of the different types of student information kept by different institutions and how this data is shared. It also considers what is thought to be effective about the way student information is managed and coordinated. The chapter establishes the gaps and challenges of SIMS in Uganda.

#### 6.2 Background to the study's respondents

The study respondents who participated in this research included administrative staff, main informants, students, and other key people. The socio-economic status of the respondents that participated in this study influenced their responses. It is therefore important to understand the background of the respondents so as to place the findings in the subsequent chapters in their proper context. This section discusses these characteristics. The issues considered in the selection of respondents included: their positions and responsibilities, periods of service and experience, levels of education and training, and the nature of the institutions from which they came.

In order to answer the first research question of this study, namely (what is the current state of the coordination of student information in Uganda) a number of data collection methods were used to obtain data from individuals and different groups of respondents. The target groups can be divided into four categories: administrative staff (A) in educational institutions; key informants (B) holding various key positions in semi-autonomous organisations in the education sector, the Ministry of Education and Sports, and district education offices; students in various educational institutions (C); and the focus groups (D) that comprised of people in academic leadership positions and student leaders. In total, there were 60 respondents in the administrative staff category, 47 in that of key informants/interviewees and

59 student leaders. Four focus groups were formed for the joint category of academic staff with administrative responsibilities, and others with student leaders.

A semi-structured questionnaire was given to administrative staff in educational institutions, with the intention of obtaining responses informed by their experiences as the implementers of the current system. These administrators were selected from various categories of institutions: secondary schools (S), training institutions (primary teachers colleges, and technical, vocational and business institutes) (V), other tertiary institutions (T), and universities (U). Another questionnaire was administered to student leaders because they have a role to play in coordination of information in their institutions. They possess much information on student affairs both of a routine and administrative nature.

Interviews were conducted with key informants from various categories of institutions in the education sector. These included officers in key managerial positions in bodies like the Uganda National Students Association (UNSA), the Uganda National Examination Board (UNEBC), the National Council for Higher Education (NCHE), the Uganda National Curriculum Development Centre (NCCDC), the Educational Standards Agency (ESA), the Ministry of Education and Sports (MoES), and the districts. The interviews also targeted heads of universities and other tertiary institutions. Care was taken to make sure that the heads of the educational institutions that were interviewed did not double as questionnaire respondents. The interviewees were selected because they were believed to be part and parcel of the policy-making process and to oversee the implementation of activities concerning the coordination of student information in the country.

Three of the focus discussion groups were drawn from academic staff from three different categories of educational institution (university, primary teachers college and secondary school). The one focus group with students stemmed from a university. Focus group discussions and other methods were used to capture as wide a range of information as possible.

To obtain more information and further opinions, the researcher participated as an observer in various activities and/or events that take place during a student's career, such as selection of students entering senior one (S1), senior five (S5), and higher education (Section 4.3 explains the present structure of the education system, appendix I shows the levels of education, and figure 6.1 illustrates the flow of student information in the education system in Uganda). The researcher was also involved in registration and student orientation at one public university. Various meetings during the sensitisation (making aware) of various stakeholders were also attended on how to store and maintain student

information in the education sector. Appendix 6.3a shows a list of events observed. During such events, the researcher interacted with a number of people who gave their comments, as will be highlighted from time to time in this and succeeding chapters. The study also analysed different documents to verify the factual value of the opinions obtained from the other instruments, such as the questionnaire. Policy and various other documents, located at different places such as notice boards and records centres were reviewed to clarify and gain more insight into the data obtained by using the other methods as explained in earlier paragraphs in this section.

### 6.2.1 Selection of respondents

Administrative staff were the main respondents in this study. They are the custodians of the regulations and policies that govern the management of institutions. They are responsible for the day-to-day running of the institutions, and are therefore the reference points of the organisations. The geographical distribution of the institutions was considered during the selection of the respondents as shown in table 6.2a.

**Table 6.2a: Selected Questionnaire Respondents in Institutions as per Geographical Regions**

Levels of Institutional	East	%	West	%	Central	%	North	%	Total	%
	n=12		N=12		n=31		N=5		n=60	
Training (BTVET)	2	16.7%	3	25%	2	6%	1	20%	8	13%
Secondary	2	16.7%	2	17%	3	10%	3	60%	10	17%
Other Tertiary	5	41.7%	4	33%	4	13%	1	20%	14	23%
University	3	25%	3	25%	22	71%	0	0%	28	47%
<b>Total</b>	<b>12</b>	<b>100%</b>	<b>12</b>	<b>100%</b>	<b>31</b>	<b>100%</b>	<b>5</b>	<b>100%</b>	<b>60</b>	<b>100%</b>
% per region		20%		20%		52%		8%		100%

The majority of the respondents were selected from universities (47%) and other tertiary institutions (23%) totalling 70%. The high population of respondents from the central region (71%) is due to the fact that most of Uganda's universities are located in this region. The rest of the respondents were selected from secondary schools (17%), and training institutions (13%) totalling 30%. These categories are important for this study because they supply higher education with students and they are a source of student information for higher education.

Of the 28 administrative staff members selected from universities, 79% were based at public universities: Makerere (43%), Kyambogo (25%) and Mbarara (11%). On the other hand, staff members from three private universities (21%) included those at the Islamic University in Uganda (10%), Ndejje

University (7%), and Nkumba University (4%). Makerere University contributed a significantly higher number of respondents mainly because of its historical importance in higher education in Uganda, as mentioned earlier in Section 4.6.1. Another reason has to do with its size: 19 faculties (including schools and institutes) with an administrative staff of about 5,000 and 35,000 students made Makerere University statistically significant for the study. Kyambogo University on the other hand was selected because it is mandated to coordinate work of various institutions as the qualification awarding body: all the primary teachers colleges (PTC) and national teachers colleges (NTC) in Uganda. The community-based approach and location of Mbarara University of Science and Technology in western Uganda made it a suitable choice as part of the study. The Islamic University in Uganda was selected because it is the first private university and the only one established by a statute of parliament. Ndejje and Nkumba Universities were included in spite of the fact that, although they have been in operation for some years, they had at the period this study was undertaken, not obtained national recognition of programmes and qualifications, and their graduates have therefore experienced problems in gaining entry to further studies in public universities in Uganda and abroad. In addition, the selection of respondents in other tertiary institutions was based on the type of institutions: Three NTCs, six sector based institutions (including paramedical schools and agriculture based institutions), one UCC, and two UTCs were selected for the study as shown in the table 6.2b.

**Table 6.2b: Other Tertiary Institutions by category.**

Type of Institution		No of Institutions	Number Selected	
NTC		6	3	
Sector	Paramedical schools	13	3	6
	Agriculture based	8	3	
UCC		5	1	
UTC		5	2	
<b>Total</b>		<b>37</b>	<b>12</b>	

**Key:**

*NTC: National Teachers College UCC: Uganda College of College*

*UTC: Uganda Technical College*

Sector institutions constituted a major part of the sample. They were selected mainly because of their nature and diversity regarding the coordination required in the country. These institutions are linked with other government departments as well as the Ministry of Education and Sports. The smaller number of institutions in UCC is because most of them are located in the eastern and northern parts of



Uganda: few of them could be selected for the study. The northern and eastern parts of the country are disturbed areas that have experienced an armed insurgency for more than a decade.

The researcher also interviewed 47 key informants from various institutions in the education sector: 11 (23%) were female while the majority, 36 (77%) were male. All the respondents were included on the basis of the positions they held in various organisations.

The researcher also gave questionnaires to 59 students at educational institutions. The selection of students was based on the category of institutions, i.e. 22 (37%) from universities, 19 (32%) from other tertiary institutions, 11 (19%) from secondary schools and 7 (12%) from training institutions. All students were selected on the basis of the positions and responsibilities held in the student leadership as shown in table 6.1g.

As indicated, focus groups were used to supplement the main data collection tools described above. These focus groups constituted academic staff with administrative responsibilities and student leaders as shown in the table 6.2c.

**Table 6.2c: Composition of focus groups**

<b>Institution</b>	<b>Composition</b>	<b>Numbers</b>
Kyambogo University	Academic staff with administrative responsibilities	6
Kibuli Secondary School	Academic staff heading departments	8
Shimoni Primary Teachers College	Academic staff with special responsibilities	8
Makerere University	Student Guild representatives	12

The academic staff were selected because they are responsible for coordination of academic progress of students in the institutions.

## 6.2.2 Positions and responsibilities of the respondents

The position one holds in an organisation influences the effectiveness of a system. The administrative staff were therefore asked to name the positions they held in various institutions. Table 6.2d shows the respondents that the researcher selected for the study.

**Table 6.2d: Distribution of Positions per Category of Education Institution by Gender**

Position	Training		Secondary		Tertiary		Univ. (Pub)		Univ. (Private)		Total					
	M	F	M	F	M	F	M	F	M	F	M	%	F	%	T	%
Heads of institutions	4	2	3	1	1	2	0	0	0	0	8	19%	5	28%	13	22%
Registrars	2	0	4	1	6	2	7	3	0	0	19	45%	6	33%	25	42%
Administrative Assistants	0	0	0	0	0	0	4	2	3	1	7	17%	3	17%	10	17%
Heads & representatives of Departments	0	0	1	0	1	0	2	2	0	2	4	10%	4	22%	8	13%
Students Welfare Officers	0	0	0	0	2	0	2	0	0	0	4	10%	0	0%	4	7%
Total	6	2	8	2	10	4	15	7	3	3	42	100%	18	100%	60	100%
Grand Total	8		10		14		22		6		70%		30%		100%	

### Key:

- *Heads of Institutions: These include Principals, Head Teachers, Principals or Directors, Vice Chancellors or their representatives.*
- *Registrars: These include Directors of Studies, Careers Masters/Mistresses, Registrars, and Principal tutors.*
- *Administrative Assistants: These include Secretaries, Records Officers, and Administrative Staff.*
- *Heads of Departments: Representatives of Sections/Departments.*
- *Heads of Academic and Administrative Units (e.g. Sports, Library, Medical Centres).*
- *Students Welfare Officers: Officers concerned with students' welfare including Wardens, Dean of students.*
- *Univ. (Pub): Public Universities*
- *Univ. (Private): private Universities*
- M: Male                      F: Female
- T: Total

As shown in the above table, the majority of respondents were male (70%). Out of 60 administrative staff, 25 (42%) respondents were employed in the registrar's office in tertiary institutions or in the office of director of studies in secondary and training institutions.

The administrative staff were asked to indicate exactly what they do in their respective positions. Table 6.2e is a summary of various duties and responsibilities.

**Table 6.2e: Responsibilities of Administrative Staff**

Duties and Responsibilities	No.	Duties and Responsibilities	No.
Management and keeping of academic records	5	Day to day administration (planning and coordination of activities, and supervision)	11
Academic board issues	6	Co-curricular activities (sports)	5
Admission officers	9	Preparing students' schedules, materials, and monitor learning	3
Career guidance and counselling	6	Coordinating library records	3
Preparing transcripts	4	Handling orientation of new students	2
Examination matters (supervision, compiling results).	7	Curriculum development	2
Certification of academic documents	1	Policy formulation and implementation	2
Maintaining academic standards	2	Discipline of students	2
Registration of students	9	Students welfare (accommodation, meals)	5

It was found out that the majority (11) of the respondents deal with day-to-day administration (planning, coordination of activities and supervision), while a few of them (9) deal with admissions and registration of students, with slight participation in examination matters (7), career guidance and counselling (6), academic boards matters (6), records keeping (5), and student welfare (5).

Interviewees were also required to indicate their positions they held in the organisations, and these are provided in table 6.2f.

**Table 6.2f: The Positions Held by Interviewees**

Organisation	Position	F	M	Total	Description
Uganda National Student Association (UNSA)	Head of mass mobilisation	-	1	1	Go out to post-primary institutions and educate the stakeholders concerning the duties and expectation of UNSA.
District Education Office (DEO)	District/deputy education officers	1	2	3	Overall responsibility for education in the districts
	Inspector of schools	3	3	6	Ensuring standards, curricula, policies, coordination of standards, inspection and monitoring, guidance and counselling in schools.
	Personnel officers	2	-	2	Maintaining statistics on enrolments and disciplinary matters.
	Education offices	1	1	2	Various functions as assigned by the DEO's office
MoES	Commissioners (or their representatives)	-	1	1	Coordination of the respective departments or offices in the MoES
	Education officers (principal, senior)	1	7	8	Planning for selection, supervision, and mobilisation.
	Statistician	1	1	2	Compiling and publishing statistics

Semi-Autonomous (UNEB, ESA, NCDC, NCHE)					
	Executive Secretary/director or their deputies or assistants	2	10	12	Overall responsibility for the organisation
	Heads of sections, Responsible officers	3	2	5	Coordination of the operations of the Organisations
Tertiary	Principal/director/ Deputies		5	5	Day today operations of respective institutions or offices
	Administrative staff		1	1	
University	Vice Chancellor, their deputies/ Representatives		3	3	Chair Senate, deans committees, general administration, Academic affairs, Admission, registration, graduation

**Key:**

*F: Female*

*M: Male*

*UNSA: Uganda National Student Association*

*DEO: District Education Officer*

The majority of the respondents in the Ministry of Education and Sports were education officers at principal and senior level. In semi-autonomous institutions, the majority of the respondents were deputies or assistants delegated by their heads — executive secretaries or directors.

Students were also selected according to the responsibilities held in their institutions because it was believed that students' perceptions regarding the administration of the institution are important. The student leaders also coordinate various activities in terms of academics, discipline and welfare. The selected students per category of institution are given in table 6.2g.

**Table 6.2g: Students' Responsibilities**

Student's position held the institution	Training		Secondary	%	Tertiary	%	Univ- ersity (Public)	%	Total	%
Minister	5	71%	3	27%	7	37%	15	100%	30	50%
Guild president/Head prefect/Chairman of student council	1	14%	7	64%	4	21%	2	13%	14	25%
Class, hall, monitors/captains	1	14%	1	9%	8	42%	5	33%	15	25%
Total	7	100%	11	100%	19	100%	22	100%	59	100%
% category		12%		19%		32%		37%		100%

**Key:**

- *Minister: These include students who hold the positions of Minister,*

*prefects/councillors/speaker/secretary to student's council or student's body*

- *Guild President: Include Guild president, head Prefect or chairman of student council of a student body*

The above table indicates the large number of ministers/ prefects (50%) who participated in the study. The majority of the ministers were concerned with education, discipline and women's affairs. Guild presidents/chairmen of student councils were mostly active in secondary schools (64%). Universities (37%) and tertiary institutions (32%) constituted the majority of the students that participated in the study.

### 6.2.3 Period of service and experience of respondents

Experience is the most important background characteristic in shaping ideas, views and responsibilities. All administrative staff respondents were therefore required to indicate their experience in terms of the number of years served in their current positions. A summary of the responses is presented table 6.2h.

**Table 6.2h: The Period of Service of the Respondents**

Position	Number of Years in Service for Administrative Staff						Total
	1 to 3	4 to 6	7 to 9	10 to 12	13 to 15	>15	
Heads of institutions or their deputies	4	1	3	3	2	0	13
Registrars/directors of studies	8	9	4	3	0	1	25
Administrative assistants	5	5	0	0	0	0	10
Heads & representatives of sections/departments	1	3	2	2	0	0	8
Students' welfare officers (warden, dean of students)	1	1	2	0	0	0	4
Total	19	19	11	8	2	1	60

The lengths of service of the majority of the administrative staff who participated in the research ranged from 1 to 3 and 4 to 6 years with more registrars in these groups with 8 and 9 years' service respectively. Many registrars were selected for this study owing to the important role they occupy in the management of student information in institutions.

The administrative staff were further asked to describe their experience in the various positions they had ever held in the management of student information. A summary follows.

**Table 6.2i: Experiences of Administrative Staff in the Management of Student Information**

Activities	Experiences in management of student information				
	1-5	6-10	11-15	>15	Total
Organising, setting, and marking coursework & exams	7	5	2	1	15
Processing and recording marks	5	3	2	1	11
Registration and recording of personal data	10	4	1	0	15
Admission (coding and selection)	7	2	1	1	11
Student leadership and coordination	1	1	0	1	3
Entering data in computers	2	2	1	0	5
Production of student register	1	2	0	0	3
Counselling and guidance	4	2	1	1	8
Drafting and preparing transcripts	5	2	0	0	7
Handling complaints and appeals	2	1	0	0	3
Scouting	2	0	0	0	2
Secretary to the college committees, board meetings	2	2	0	0	4
Keeping, Monitoring and handling students' attendance	2	1	0	0	3
Teaching /lecturing/supervising students	6	6	9	0	21
Keeping and handling students' records and files	4	2	2	0	8
Co-curricular and extra-curricular activities (sports)	2	2	1	0	5
Head of an institution, department responsibility (supervision)	4	9	2	1	16

The majority of the respondents possessed experience in teaching/lecturing (21 - 35%) with some taking on headship or departmental responsibilities (16 - 27%). Some respondents possessed significant experience in the registration and recording of student information (15 - 25%), the organisation, setting and marking of examinations (15 - 25%), and the processing and recording of marks (11 - 18%).

#### 6.2.4 Levels of education and training of respondents

The highest level of education (certificate, diploma, degree, or postgraduate qualification) attained by an administrative staff member was established. The majority of the administrative staff held postgraduate qualifications: 42 (70%). The rest of the administrative respondents possessed a degree (10 - 16.6%), diploma (7 - 11.6%), or certificate (1 - 1.7%). Out of 42 staff members with postgraduate qualifications, 18 (43%) were employed as registrars/directors of studies. The rest of those with postgraduate qualification included 8 (19%) who were administrative assistants, 7 (17%) who were heads of departments or sections, 6 (14%) who functioned as heads of institutions, and 3 (7%) who were deans of students/welfare officers. The majority of the heads of institutions possessed a degree or a higher qualification.

In addition to formal education, administrative staff respondents were asked to indicate what training they had received in relation to the management of student information. A few of the administrative

assistants and assistant registrars had received some short-term training in records management and the management of higher education, while others had undertaken some training in public administration and management in general. The majority of respondents said that they thought they had acquired the basics of record-keeping in the course of their education. The majority of the respondents demonstrated knowledge in computer operations, information management, and the use of Internet. The majority of directors of studies and head teachers in schools and training institutions demonstrated knowledge of the management and administration of education, and guidance and counselling knowledge. A significant number of respondents possessed knowledge about training of trainers.

The position and responsibilities held in an organisation were of paramount importance in the selection of the respondents. Geographical balance was also considered in the selection of respondents. Registrars and directors of studies played a greater role in the management of student information than officers in other positions. On average, the majority of respondents had spent four to six years in their positions. This enabled them to accumulate much experience in teaching and/or lecturing and/or departmental headship responsibilities, which contributes a reality to effective management of student information.

### **6.2.5 Documents sampled**

Ninety (90) documents that contained data about students' information were sampled and analysed for this study. The analysis of the documents was based on the purpose for which they were created and their source. The majority of the documents originated from the universities (21), UNEB (18), and other tertiary institutions (16). The other records originated from secondary schools (15), MoES (14) and training institutions (4). Only a few (2) originated in districts that were sampled for this study.

Students were the most important source of the documents used in this study. Of the 21 documents that originated from universities, 12 (63.2%) dealt with students, 4 (21.5%) were authored by the academic registrar, and the rest (15.3%) by the bursar, head-teachers and sponsors. The same pattern was also true for training institutions and other tertiary institutions. In training institutions, documents relating to students contributed 41.7%(5), compared to 33.3%(4) for principals and 25%(3) for examining bodies (including UNEB). Likewise out of 19 records sampled in other tertiary institutions, 63.2%(12) were concerned with students, 15.7%(3) were authored by academic registrars, and the rest 21.5%(4) by the medical officer, examiners and awarding bodies. In the case of secondary schools, head-teachers were the source of most of the documents, namely 67.7% (12). All the documents sampled in MoES and the

districts were authored by head teachers. Appendix 6.1 gives a summary of the records analysed for this study.

#### **6.2.6 Institutions selected for the study**

Respondents were asked to provide the values (vision, mission, aims and objectives) of their institutions. The institutions selected for this study include the Ministry of Education and Sports, district education offices, semi autonomous organisations including the Education Standards Agency (ESA), National Council for Higher Education (NCHE), Uganda National Examination Board (UNEb), National Curriculum Development Centre (NCDC) and institutions of higher learning (as explained in Section 4.6).

The overall aim of the MoES is to provide quality education. The Ministry achieves its objectives (as discussed in Section 4.5) through various bodies including NCHE, UNEb, ESA and NCDC, and districts. For example, NCHE ensures delivery of quality higher education in the country. It is responsible for ensuring minimum standards and coordination of higher education in Uganda. Whereas NCDC is charged with designing curricula to meet the desired goals and objectives of the education sector, UNEb sets and administers national examinations, and ESA sets and ensures minimum educational standards as will be explained further in this chapter. Figure 6.1 shows the relationship between the MoES and the semi-autonomous organisations. For example, ESA's aim is to maintain qualitative academic and disciplinary standards in the education sector and maintain discipline in educational institutions. ESA's mission is therefore to provide both quality and mass education for the citizens of Uganda by making these accessible to all. Its role is to provide a rational system for setting and defining standards of quality education and training, and to monitor the achievements in the education sector. ESA is in charge of inspection of educational materials, behaviour of students, professional conduct of teachers, classroom and general academic assessment. ESA attempts to improve the management of teachers, expansion of manpower resources and regional inspection.

District education offices are required to carry out the Ministry of Education and Sports' vision and mission, as they constitute its extensions. In Iganga District, for instance, the mission is 'inclusive quality education for all' (Nadyanga, C. I. Assistant Education Officer Inspectorate, Iganga District. 2003. Personal Interview. Iganga, 16<sup>th</sup> September). It is the responsibility of districts to ensure equalisation of opportunities for education in Uganda. Every child, regardless of special needs, has the right to education, an education officer responsible for special needs noted. Planning, organising and



monitoring the quality of education is clearly a function of the district education office. The district office also ensures that all data regarding schools is available for planning purposes. The district education office is the over-all custodian of policies on education and takes charge of their implementation.

### **6.2.7 Data analysis**

The analysis of data in this study involved data reduction, display and conclusion drawing and verification (Miles & Huberman 1994:10). Data reduction refers to a process that involves simplifying and abstracting raw data through data summaries, coding, and clustering. Using AskSam qualitative data analysis software, data collected was entered in a database and analysed with the use of sorting and noting reporting features, and related entries were extracted and compared. Repetition of ideas by different respondents was noted. Meanings were formulated by using the main concepts extracted, to arrive at a final position on the specific points made by each category of respondent. Clusters of themes were formulated from these points, for the researcher to be able to arrive at general observations and conclusions at the end of each research question. Thus matrices, tables, networks, context charts (Miles & Huberman 1994) and narrative descriptions were used to assemble organised information for this purpose. This involved an interplay between qualitative and quantitative data (Strauss & Corbin 1998:27) where it was necessary, to allow the SIMS as the object of study to emerge. Regularities, patterns and causal flows were deduced from the data to reach conclusions (Strauss & Corbin 1998:12) that were verified for their validity by comparing it with the data collection, reduction and displays already explained. For purposes of ensuring ethical and authenticity of research results, unless otherwise stated, the researcher preferred his respondents stay anonymous.

### **6.3 Student information stored in various institutions**

In order to determine the state of coordination and management of student information, this research endeavoured to identify what kind of student information was stored in various institutions in Uganda. Respondents were asked about the kind of information kept and its purpose.

### **6.3.1 Categories of information**

From questionnaires administered to administrative staff, responses obtained were analysed according to the categories of information stored: personal, selection and admission, registration and enrolment, examination, administration, financial, employment, co and extra-curricula and on the student body. Details follow.

#### **a) Personal information**

Personal information is accumulated over time. It comprises such details as family and parental background, and includes information about parents (ancestors, place of origin, names), as well as biographic data about a student, e.g. names, age, gender, sex, and birth records. It also includes a student's personal history and previous medical records. Data concerning a student, like his next of kin and contact information (in case of emergency, or about the contact details of a student's sponsors is also kept. Institutions also record the citizenship of a student, contact and home addresses (district, county, sub-county, village, postal addresses) of a student. This helps to keep track of all the information regarding a student's status and identity.

#### **b) Admission and selection**

Application and admission records are generated immediately when a student applies to an institution. These include a letter of admission, selection lists, and previous educational background. Usually, academic documents (pass slips and certificates), awards, reports and transcripts accompany application forms to aid selection. These records are maintained to ensure that students possess the minimum requirements, so as to select the students eligible for a particular course of study. This information also keeps track of a student's school of origin, and previous educational background.

#### **c) Registration and enrolment**

Registration records (forms, registers, courses and subjects), identification/ records (school album, passport photo), library, registration and borrowing cards are stored in most of the institutions. These records are generally used to track students admitted to and enrolled in the institution, to prepare academic transcripts for students and to keep records of students registered for each course. Registration records maintain data about identities of students that enable easy tracking of required information about a student in an institution: to certify the authenticity of a student; in issuing of results; and in ascertaining that the person receiving a certificate is the right one.

#### **d) Examination records**

These include progressive assessment records, coursework marks, mark lists and promotion reports, as well as duty and class attendance records (roll calls, attendance, registration lists, class lists, hall allocation lists and duty rosters). In many institutions, examination cards or authorisation to write exams are kept. These records enable one to perceive the accumulated achievements and evaluate the performance of a student in an institution. This guides administrative and faculty staff in the promotion of students to another level of education. Exam records help officials to monitor competences and issue a certificate of due performance by students. It is these records that are used to prepare academic transcripts for students. Registration records assist administrators to identify a student easily, to track institutional defaulters, lock out impostors and reduce impersonation in the institution.

#### **e) Qualifications and awards**

These include testimonials and certificates of merits, verification records (that a candidate is a bona fide candidate), and certification information (e.g., acceptance form, declarations and oath of allegiance). The purpose of such records is to show the competencies of the student in various disciplines and events. Qualification verifies that the student is a bona fide examination candidate. It confirms performance and the qualification awarded.

#### **f) Administrative, discipline and clearance**

These records include statistics, discipline records, clearance records, medical records, follow-up and evaluation procedures and other administrative issues.

Statistics normally include dropout rates, enrolment statistics, performance, registration, and qualification statistics. The purpose of such statistics is to monitor the number of students completing a course, to assist in planning and to ensure an equitable distribution of the required. Statistics about affirmative action are stored to ensure adequate meeting of the needs of women.

Disciplinary records maintain information about disciplinary action, behaviour records, appeals, the number of students who have faced disciplinary committees and absence from the institution. The purpose of this information is to keep track of a student's personality, behaviour, discipline, and conduct.

Medical records/health status: This includes medical cards, diagnoses, medical files, medical check-

ups, records of sickness (student's health, hygiene status, check-ups, health complaints and medical shortages). The purpose of this information is also to track which students have a medical problem so that this is known before it spreads, to be aware of students who have complications that may require attention, and to verify if a student has an illness that might hinder his studies.

Follow up and evaluation: these records include interview records, academic board matters, records regarding tutors/lecturers, teachers records, external examiner and minutes of activities. These records evaluate institutional performance

Correspondence and administrative records: Letters written to students, within or outside organisations, for instance by boards of governors or staff. Various educational institutions store circulars. The higher education institutions also keep consultation information, counsellors' lists, personal tutor reports, and information on the needs of each student. On the other hand, administrative records (work plans, budgets, administrative structures, exam timetables, course modules, graduation booklets, scholarship information) keep track of activities, meetings and programmes.

Procedures, rules and regulations include policy statements, college regulations governing awards, resolutions, agreements and procedures. These are stored to help students to follow the rules and regulations.

#### **g) Financial and clearance information**

Financial records include: receipts for payments/fees, allowances paid to students, fees registers, and lists of fees defaulters. The purpose of such information is to keep track of payments made by students in meeting their financial obligations and for financial accountability.

Clearance records include: records maintained by the bursar or heads of departments. The purpose is to enable students to be cleared by different departments. These records ensure that fees, payments and other dues are cleared. Clearance also ensures that books or tools borrowed from different departments are returned before students leave. These matters are checked before academic transcripts and certificates are issued to the candidate.

#### **h) Employment and alumni records**

Attempts have been made to keep lists of alumni, sponsors, lists of candidates who have entered higher education, job placements and follow ups, copies of recommendations and convocation newsletters.

The purpose of such records is to keep track of students after they have left the institution. This helps a higher education institution to assess the achievements of former students in order to justify its contribution to the world of work.

### **i) Student body records**

In most higher education institutions, records of students' participation are maintained, records of clubs and societies, student affairs, meetings, guild council affairs, Uganda National Students Association (UNSA) affairs, guild files, student bodies, constitutions, prefects' lists and student local council committee reports. Other records include student views, student responsibilities, memoranda, complaints and minutes of student organisations). This helps the institutions to discover students' abilities in leadership, interaction, socialisation to monitor students' involvement generally and to maintain links with the student body in conducting official business with students.

### **j) Co- and extra curricular students' records**

Records of interclass, hall and institutional competitions, the sports which students play, national sporting activities and lists of teams are maintained, as well as records of opportunities, talents, physical fitness, and so on. Records of good performers and students' talents assist the administration to encourage students to excel in sport. This helps to assess performance in co-curricular activities, to know the players, to select teams for competitions, plan for the future, and to monitor the progress of sports activities. For example, as noted by many of the sports tutors interviewed, some of the best players are hired to play for other teams.

To confirm responses from administrators about the type of information stored, 90 documents containing student information were sampled from various institutions and organisations that contained student information — appendix 6.1 shows a summary of the analysis of these documents. The data attributes (contents of the information kept) were recorded and their frequencies computed. For each data attribute, the number of documents that kept information about such data were counted. In total, 90 records were sampled consisting of 7 records from the primary level, 30 from the secondary, 13 from training institutions, 19 from other tertiary institutions and 21 for universities. The type of information identified was computed on the basis of each type of education institution as shown in table 6.3a.

**Table 6.3a: Content Analysis of Information Kept from the Records Sampled**

Type of information	Primary		Secondary		Training.		Tertiary..		University		Total	
Total number of records	7		30		13		19		21		90	
	F	%	F	%	F	%	F	%	F	%	F	%
Academic background (institutions, years attended, results or grade obtained)	4	57.1	3	10.0	1	7.7	8	42.1	6	28.6	22	24.4
Names (surname, first name, and other names)	4	57.1	25	83.3	13	100.0	16	84.2	21	100.0	79	87.8
Gender (male/female)	4	57.1	14	46.7	7	53.8	6	31.6	11	52.4	42	46.7
Marital status (status, number of children)	0	0.0	0	0.0	1	7.7	3	15.8	9	42.9	13	14.4
Religion	0	0.0	3	10.0	1	7.7	4	21.1	5	23.8	13	14.4
Place of origin (district, sub-county, village, address)	4	57.1	6	20.0	4	30.8	8	42.1	9	42.9	31	34.4
Home address/permanent address (physical or postal)	4	57.1	7	23.3	5	38.5	9	47.4	10	47.6	35	38.9
Ethnic (tribe), language	0	0.0	2	6.7		0.0	1	5.3	0	0.0	3	3.3
Birth records (date, place of birth, age)	3	42.9	7	23.3	4	30.8	8	42.1	6	28.6	28	31.1
Contact/postal address (box, telephone, email, fax)	2	28.6	1	3.3	1	7.7	7	36.8	8	38.1	19	21.1
Nationality and citizenship	1	14.3	3	10.0	1	7.7	4	21.1	3	14.3	12	13.3
Parental/guardian information (name, signature, address), relationship, occupation, father/mother	3	42.9	4	13.3	0	0.0	6	31.6	4	19.0	17	18.9
Next of kin or reference (name and address)	0	0.0	0	0.0	0	0.0	2	10.5	1	4.8	3	3.3
Sponsor, bursary (organisation, individual)	0	0.0	1	3.3	0	0.0	2	10.5	9	42.9	12	13.3
Particulars of the institution	6	85.7	18	60.0	7	53.8	8	42.1	15	71.4	54	60.0
Registration status (subjects of study, choices), courses offered, subjects, year of study	3	42.9	15	50.0	11	84.6	10	52.6	14	66.7	53	58.9
Academic performance (certificates, total grades, marks)	3	42.9	15	50.0	7	53.8	5	26.3	4	19.0	34	37.8
Class attendance	1	14.3	2	6.7	0	0.0	0	0.0	0	0.0	3	3.3
Continuous progressive assessment (reports)	3	42.9	2	6.7	2	15.4	1	5.3	0	0.0	8	8.9
Enrolment and performance statistics (numbers)	5	71.4	4	13.3	1	7.7	0	0.0	0	0.0	10	11.1
Discipline and behaviour records	2	28.6	2	6.7	0	0.0	0	0.0	0	0.0	4	4.4
Photograph (fixed, stamped)	3	42.9	3	10.0	1	7.7	5	5.0	11	52.4	23	25.6
Index number/registration number	3	42.9	9	30.0	8	61.5	7	36.8	8	38.1	35	38.9
Special problems (home, parent, child)	0	0.0		0.0		0.0	2	10.5	0	0.0	2	2.2
Declaration & certification by student (dated & signed)	1	14.3	3	10.0	5	38.5	10	52.6	10	47.6	29	32.2
Verified and forwarded by (e.g. sponsor, Head of Department, parent), local council, District Education Officer, spouse.	2	28.6	8	26.7	1	7.7	8	42.1	5	23.8	24	26.7
Official use: Signature and stamp by authority	2	28.6	18	60.0	7	53.8	9	47.4	14	66.7	50	55.6
Discipline (conduct, behaviour, commitment)	0	0.0	1	3.3	0	0.0	2	10.5	0	0.0	3	3.3
Health record (diagnosis, reports), clinical and laboratory tests	1	14.3	2	6.7	0	0.0	5	26.3	1	4.8	9	10.0
Previous certificates of merit and awards	0	0.0	1	3.3	0	0.0	6	31.6	0	0.0	7	7.8
Abilities and interests in co- and extra-curricular activities	2	28.6	0	0.0	0	0.0	3	15.8	0	0.0	5	5.6
Physical handicaps (special needs)	1	14.3	0	0.0	1	7.7	0	0.0	0	0.0	2	2.2
Comments (e.g. recommendations, remarks)	0	0.0	4	13.3	2	15.4	2	10.5	1	4.8	9	10.0
Expected (future) information, e.g. date of completion, employment	0	0.0	0	0.0		2.0	1	5.3	1	4.8	2	2.2
Employment record (organisation, period, position)	0	0.0	0	0.0	2	15.4	3	15.8	1	4.8	6	6.7
Fees payment status (amount, date, bank, purpose)	0	0.0	3	10.0	3	23.1	1	5.3	3	14.3	10	11.1
Clearance status	0	0.0	2	6.7	1	7.7	3	15.8	2	9.5	8	8.9

**Key:**

*F: Number of records that contain the type of information.*

Note that the total percentage could not total to 100% since one record could have more than one type of information considered for computation.

From the table above, it is clear that names (87.8%), details of educational institutions (60%), registration status (58.9%), and signature and stamp originating from an authority (55.6%) are required by most of the institutions as shown by the documents sampled. Analysis also shows that information on birth records is captured in both universities (42.9%) and other tertiary institutions (42.1%). Information such as photographs (25.6%), index/registration numbers (38.9%) and declarations by students (32.2%) signifies the need for identification of students.

Responses from interviews conducted among the heads of universities and other tertiary institutions concur with the results obtained from the questionnaires. The heads of universities and tertiary institutions (vice chancellors and principals or their deputies or representatives) keep and handle records concerning policy issues in their institutions. Some of these records include programme requirements, courses, credit hours, scholarship linkages, formal and informal policy issues, official communications within and outside institutions and statistical annual returns, performance figures and intake capacities.

### **6.3.2 Responses in Interviews regarding what student information is kept**

Interviews conducted among the various key informants outside the educational institutions showed that the information kept largely depends on the roles which the respective institution play. They also store such information for purposes of control and overseeing the operations of the institution as shown in table 6.3b.

**a) Districts education offices:** For each school, district offices capture information regarding used capitation grants, attendance books, schemes of work, registers of pupils and lesson plans.

Inspectors of schools in districts examine the school files, what is taught, pupils' age, behaviour and complaints of students and teachers. Inspection also covers information on students' profiles.

Enrolment per school (primary, secondary, private or government), district inspection releases,

primary leaving examination results and census information are also stored.

**b) Ministry of Education and Sports (MoES):** The Ministry keeps lists of students according to levels of education during selection of candidates to higher levels. Information given to students on subject choices, courses at tertiary institutions, application forms, and changes of subjects is maintained. It also stores enrolment figures in courses offered at various institutions. In addition it keeps statistics about enrolment in institutions, results needed for placement, choices of subjects, and students' examination results.

**c) Educational Standards Agency (ESA):** Information on materials, lessons and assessment, ages and numbers of students and enrolment is kept by ESA.

**d) Uganda National Examinations Board (UNEb):** This Board stores examination registers, registration entry forms, mark sheets, verification forms or letters, certificates, attendance forms, lists of results and examiners' reports.

**e) National Council for Higher Education (NCHE):** Information on institutions, such as when they were founded, their mission statements, enrolment figures and infrastructure is housed by the NCHE.

Many of the above institutions emphasise the use of registers and store statistical information about themselves and their students in general. The type of information kept depends on the targeted users of that particular information.

### 6.3.3 Users of students' information

The respondents were requested to identify the users of the various categories of student information. These were analysed according to categories of information and the type of users. Table 6.3b summarises the various responses of the users.

**Table 6.3b: Users of Students' Information**

Users	Personal.	Selection	Registration.	Examination	Qualification	Administration.	Financial	Employment.	Co-Curricular	Students welfare



MoES	+	X	Ā	/	+	/	/	/	/	/
Other ministries	/		/	/	/	/	/	X	+	/
UNEB & others	+	X	Ā	X	X	/	/	/		
Other line education institutions	/	/	/	/	/	/	/	/	/	/
Employers	X		/	/	/	/	+	+	+	/
Districts	/	/	+	/	/	/	/	/	X	X
Students	X	X	Ā	X	X	X	X	X	X	X
Parents	X	X	Ā	X	X	/	X	+	/	/
Governing boards or councils	/	/	/	/	/	/	/	/	/	/
Joints Admission Boards	X	X	/	/	/	/	/	/	/	
Educational institutions	X	X	Ā	X	X	X	X	X	X	+
Educators/supervisors	/	/	/	X	+	/	/	/	/	/
Public	/	/	/	/	/	/	/	/	/	/

**Key:**

*X = major responsibility      + = major involvement      / = some Involvement.*

**Note:**

- Other line ministries include: Ministry of Health, Ministry of Agriculture, Animal Industries and Fisheries, Ministry of Public Service, Ministry of Finance and Economic Planning.
- Governing boards or councils: Includes the institutional councils with their sub-committees
- Public: These include specialists, former students, police, alumni, donors, lawyers and well-wishers.

Analysis shows that there are variations in the users of records per each category of information. The MoES uses most of these records for registration information and for planning purposes. UNEB and other examining bodies use much of the student information for examination purposes. The Board of Governors or governing councils use information for administrative purposes. Most of the student information is used to meet each user’s particular educational goals. The Joint Admissions Board (JAB) for instance is concerned with selecting students for higher education. It was observed that no institution possesses a complete record of student information.

**a) Reasons for sharing student Information**

As evident from the questionnaire distributed to administrative staff, different respondents gave different reasons regarding the reasons for sharing student information, as indicated in table 6.3c.

**Table 6.3c: Sharing of Student Information Between Educational Institutions**

Purpose of sharing	Universities and Awarding bodies	UNEB	MoES	NCHE	Districts
--------------------	----------------------------------	------	------	------	-----------

Selection of candidates	A	A	A		
Planning and development	H	P	A	H	P
Monitoring performance and quality assurance	H	P	A	H	P
Appraisals	H	P	A	H	P
Application of candidates	P	P	A		
Enrolment figures and statistics	H	P	A	H	P
Funding and payment of grants to students			A		P
Publicity and media	A	P	A	H	P
Policy statements and circulars	A	P	A	H	P
Ensuring educational standards and quality Assurance	H	P	A	H	P
Training, sensitisation	A	P	P		P
Career guidance and counselling	P	P	P		P
Reports (monthly, confidential)	H	P	A	H	P
Registration of students	H	P			
Examination process	H	P			
Moderating and external examining	H	H			
Cross transfers of students	H	P	P		P
Handling disciplinary matters	H	P	A		P
Verification and certification of students information	A	P			
Qualifications and awards	H	P		H	
Co- and extra-curricular activities	H		A		P
Research, practicum and field Work			A		A

**Key:**

*H: Higher education institutions only*

*A: All educational institutions.*

*P: Post-primary education institutions (secondary, PTC, BTVET)*

Interviews conducted with the MoES confirm the sharing of information with other institutions. For example, the Ministry interacts with the institutions through radio talk shows, guidance, training and with the public through career days in schools. Interviews also confirmed that the Ministry shares information with UNEB and universities during admission for the purposes of verification of results, awarding certificates, and when rectifying errors in the result slips. When UNEB officials were requested to comment on the circumstances under which they share information, they indicated that UNEB shares information with schools, the Public Service, employers, police and researchers. UNEB also shares student information with higher education through JAB during admission processes as will be discussed in the next section. On the other hand, employers often require information from schools about a student for purposes of practical internship placements, letter of verification, quality assurance, research, and fieldwork.

Despite the need for sharing of student information, there is no comprehensive system in place to enable coordination of student information in the country as reflected in figure 6.1.

## b) Type of information shared

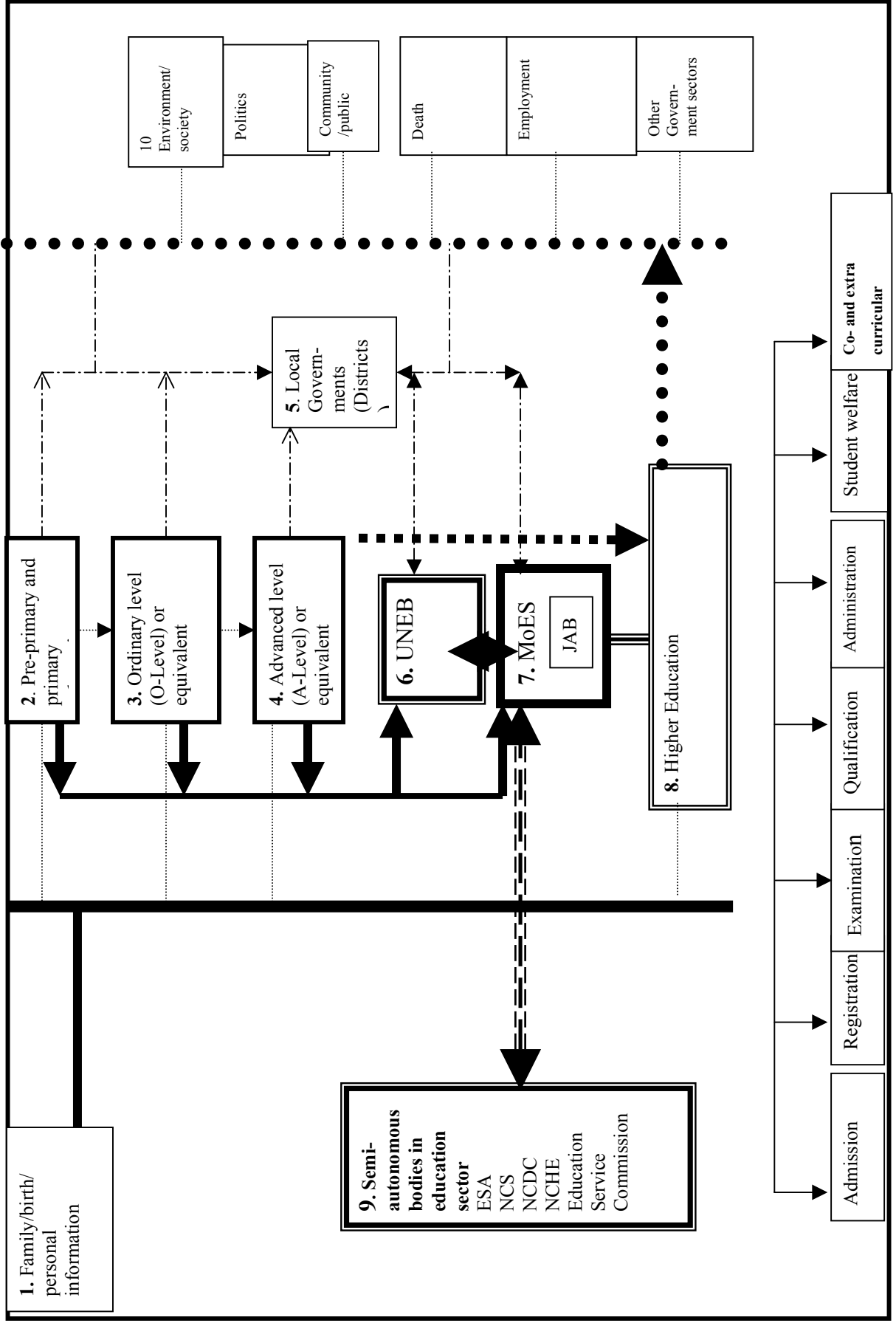
An inquiry was made of administrative staff to indicate what type of student information is shared.

**Table 6.3d: Types of Information Shared**

<b>Type of information</b>	<b>Examples of shared information</b>
Academic documents and awards	Certificates and pass slips results, transcripts, and results from UNEB.
Admission	Application information, selection list, admission list, UNEB, Joint Admission Board register.
Registration records	Student enrolment, registration information including subjects and courses, and combinations.
Personal information	Information regarding students, and their track record e.g. grades, reasons for transfer, social interaction.
Identification	Information concerning student identification
Verification and certification	Authenticity/validity of qualifications, e.g A-level results
Examination record	Progressive assessment and performance, previous exam results, conduct and progress of a student, eligibility of registered candidates, credit obtained, continuous assessment results, and normal progress lists.
Statistics	Annual statistical returns, enrolment in service, number of qualified students, numbers, transfer requested, dismissal recommended, and enrolment figures.
Procedures, rules and regulations	Guidelines on registration, grading, marking, release. regulations, functions, circulars.
Co-and Extra-curricular	The strength of each student in sport, the ability of each student in performing/other extra-curricular activities and the particular events participated in. The age, weight and height of a student.
Health records	Health conduct, responsibility, etc.
Discipline of students	Students' conduct. Disciplinary matters or issues.
Payments and receipts	Payment or non payment of fee or fees structure.
Follow up and evaluations	Institutional capacities, academic standards. Completed and ongoing research.
Administrative records	Processing of funds, criteria for giving and using grants. Guidelines and reports about a student's performance, activity schedules and students' welfare.

Information shared depends on users' requirements. The available procedures, however, lack a coordinating strategy for capturing, storing and allowing access to student information. The next section describes the various events in the management and coordination of student information in Uganda, as summarised in figure 6.1.

Figure 6.1: A Context chart of Student Information for Higher Education



Key



Controls and standards

Biographic data entering the system from outside the education system



Student information movement within the education system



Open to the environment

ESA:	Educations Standards Agency
NCS	National Council for Sports
NCDC:	National Curriculum Development Center
NCHE:	National Council for Higher Education
MoES:	Ministry of Education and Sports
UNEB:	Uganda National Examnation Board



## **Description of figure 6.1 above**

Box 1 represents the biographical data of a prospective student/pupil as he enters an institution at any level of the education system. This information enters the system at all levels: see boxes 2, 3, 4, and 8. The thick line from Box 1 to the vertical one shows the real personal data about a student before entering any of the levels of the education system in Uganda. Note that biographical data is dotted as it enters the education system. The dotted lines from the thick vertical line to boxes 2, 3, 4, and 8 show that some biographic data changes as a student enters the different levels of education.

When a pupil enters pre-primary and primary education (Box 2), he accumulates data that remains at that level. At the end of the primary level, a pupil writes the Primary Leaving Examination (PLE). This requires a candidate to register with UNEB (Box 6) for national exams. When the same candidate applies to be admitted to secondary education or its equivalent, a copy of the application form is given to a student's school of first choice, another one to the MoES (Box 7), while the third one remains at the school. The student however does not necessarily go to the school of first choice. This form is supposed to be transferred at the time of admission but in many cases it is not, as shown by the dotted double arrows from Box 2 and 3. The same process of registration for examination and application applies to O-level (Box 3) and Advanced level (Box 4) when entering higher levels. In the execution of their duties, MoES and UNEB handle these activities through district education offices (Box 5) that perform the coordination function. The arrows connecting the educational institutions are dotted, meaning that the information does not necessarily move from one level to another.

At advanced level or its equivalent (Box 4) a student registers for UNEB exams. He also applies to MoES and a copy of the application goes to the higher education institution of the first choice (Box 8). The Joint Admissions Board (JAB) does the selection on behalf of the MoES. At this level, selection is done in two phases. The first phase concerns all public universities, according to the programmes and courses applied for. The remaining students not admitted to the public universities through JAB are selected for courses in other tertiary institutions. Students who enter private higher education institutions apply directly to the respective institutions, which carry out selection themselves. The MoES has semi-autonomous bodies that are concerned with policies, standards, and monitoring as indicated in Box 9 in all the levels of education.

When a student enters higher education, there are a number of events that happen in the process of management of student information. A student is admitted, he registers, sits examinations, qualifies;

and graduates. In all these events, a number of processes, as will be discussed in the next section, occur and in due course other student information is created. After completing his studies at a higher education institution, the student enters the employment sector in a different environment or society (Box 10). Note that the information that connects levels of education with the environment is dotted. This implies that there is no system to ascertain what qualification and other information the student obtained from the institution and what information is available to the public.

#### **6.4 Processes in the management and coordination of student information for higher education**

To understand the current state of the student information management system in Uganda, it is required that the procedures and coordinating features in place be established. Questionnaires, interviews, and document analysis were used to discover procedures. The various processes through which information passes in a student's history at an institution were considered. The researcher administered questionnaires to the administrative staff of various categories of educational institutions. From the field study, it was clear that many of the processes depended on the policy guidelines provided by the management of these institutions and organisations. However, it was discovered that most of these processes are never documented, and where they are, they are unclear and often uncoordinated. It was also clear that, many of the universities and tertiary institutions coordinate with UNEB and MoES in carrying out the processes of admission, registration, and verification of student information, although there is no clear strategy for doing so.

##### **6.4.1 Admission process**

Generally, admission of students to secondary schools and training institutions is carried out centrally by the Admission Selection Committee under the Department of Special Education, Counselling and Career Guidance in MoES. Similarly, admission to tertiary institutions and universities is undertaken by the Joint Admission Board (JAB) in the Ministry. In both cases (the selection committee and JAB), there is in place admission procedures to guide the admission exercise.

A review of policy documents concerning admission and participatory observation by the researcher revealed that similar guidelines are followed in both senior one (S1) and senior five (S5) admissions. The criteria of selection for S1 are based on the order of merit according to the Primary Leaving Examination (PLE) results and the original order of choices of secondary schools made by pupils. A senior five admission is based on the best 8 subjects at O-Level. The selection committee admits up



to 90% of applicants for boarding schools and 95% of applicants for day schools for senior one; and 95% for S5, 65% for primary teachers colleges (PTC) and 82% for technical institutes. The percentage gaps (i.e. 10% and 5%) are filled by the respective schools. Affirmative action, requires that at least 1/3 admissions be females at all levels

Selection to public universities and other tertiary institutions is based on the guidelines issued by MoES. According to the policy documents and observations made by the researcher, there is a set of procedures by means of which admission into higher education is conducted. The processes are summarised in the table 6.4a.

**Table 6.4a Admission Processes for Post Primary Institutions and Higher Education**

Process	Admission requirements	Parties involved	Out puts
<b>Admission to post primary institutions</b>			
<ul style="list-style-type: none"> <li>◆ Sorting out selection documents and copies of application forms according to intake lists</li> <li>◆ Receiving copies of application forms from respective schools</li> <li>◆ Listing selected pupils details, writing these details in duplicate and submission of the list</li> <li>◆ Submitting lists duly signed by school</li> <li>◆ Preparing admission letters, enclosing them in envelopes and ensuring they reach the admitted students</li> </ul>	<ul style="list-style-type: none"> <li>◆ Computer admission lists</li> <li>◆ Computer transfer lists</li> <li>◆ Proposed intake list</li> <li>◆ Manual admission form</li> <li>◆ Manual transfer form</li> <li>◆ Computer list of candidates selected.</li> <li>◆ Application form (form X)</li> </ul>	<ul style="list-style-type: none"> <li>◆ UNEB</li> <li>◆ MoES selection committee</li> <li>◆ Schools</li> </ul>	<ul style="list-style-type: none"> <li>◆ Completed and signed admission lists</li> <li>◆ Admission letters</li> </ul>
<b>Admission to higher education</b>			
<ul style="list-style-type: none"> <li>◆ MoES issues forms to schools. Students fill in forms</li> <li>◆ Schools verify and submit forms to the Ministry</li> <li>◆ UNEB conducts and administers exams</li> <li>◆ UNEB processes and compiles student results</li> <li>◆ UNEB processes the selection of candidates on behalf of the MoES</li> <li>◆ The Ministry admits them according to the places available</li> </ul>	<ul style="list-style-type: none"> <li>◆ Admission procedures</li> <li>◆ Requirement statistics</li> <li>◆ Application forms</li> <li>◆ Admission requirements</li> <li>◆ Examination marks obtained</li> <li>◆ Cut-off points</li> </ul>	<ul style="list-style-type: none"> <li>◆ Universities</li> <li>◆ Ministry</li> <li>◆ UNEB</li> <li>◆ JAB</li> <li>◆ NCHE</li> <li>◆ Schools</li> <li>◆ Admission committee (universities)</li> </ul>	<ul style="list-style-type: none"> <li>◆ Forms certified by relevant offices</li> <li>◆ Applicants' database in place</li> <li>◆ Admission lists</li> <li>◆ Admission letters</li> </ul>

From the table above, it is clear that the information used for admission depends on the data captured on students' application forms submitted by the schools to the Ministry of Education and Sports. However, it was noted that often the application forms are not submitted to the relevant institutions. For example, it was noted that forms A and A5, meant to provide student details, are often not submitted to the schools of a student's first choice. Furthermore, it was remarked that some students do not apply at all. Lack of coordination between the examining body (UNEB) and the Ministry that does selection could be the cause of this anomaly, one deputy head teacher noted.

According to him, a student has a right to sit an exam provided he has registered with UNEB (Atukunda, Gersom, Deputy Head Teacher, St. Mary's Nkozi. 2004. Personal Interview. Kyambogo University, 3<sup>rd</sup> March). In fact at the closing of the selection exercise, Francis Angula, Principal Education Officer of MoES noted the problem of head teachers not submitting forms A and 5A. He observed that this was common with private schools (Angula, F. Principal Education Officer, MoES. 2004. Address to the closing of Admission Exercise for Senior Five, PTC and Technical Institutes. Kyambogo University 2004, 3<sup>rd</sup> March).

The implication is that student information is often not submitted to higher levels of education. This has affected the quality of information there.

From the research, a number of uncoordinated policy guidelines emerged. For instance, during the selection exercise, one principal of a PTC described what he considered as the implementation of unfair policies. He gave the example of the policy that without a pass in Mathematics and English students may not be admitted to PTC and said that there were not enough students as a result. According to him, the policy also does not favour affirmative action despite its importance in the government agenda (Etisot, Simon, G. Principal, Gulu PTC. 2004. Personal Interview. During the Admission Exercise for S5, PTC, and Technical Institutes, Kyambogo University. 3<sup>rd</sup> March, Kyambogo University).

To gain a more holistic understanding of the admission process for higher education, the researcher participated in a three-day observation of the 14<sup>th</sup> JAB selection meeting.

The selectors at the meeting noted that some policy guidelines on admission are not clear. For example, some of issues revolve around citizenship: whether external students pay the same fees as Ugandan citizens. It was noted that it was not easy to identify the citizenship of a foreign student since many of them study in Ugandan schools. It was also observed that the admission policy that regulates the ability to receive government and private sponsorship respectively was not clear. The policy required institutions to provide their enrolment capacities during selection. After a long debate on the implementation of the policy, it became obvious that members lacked information on their enrolment capacity. It was also noted that there were divergent policies operating between various governing bodies. For the nursing schools, the Nursing and Midwives Council laid down different regulations from those set by the Ministry of Education and Sports.

Members also noted a lack of collaboration between JAB and the institutions. Although more

collaborative meetings to discuss policy issues were called for, MoES insisted that this was costly and therefore unaffordable. It was proposed that to enhance collaboration, a common format for admitting students to tertiary institutions be used. Although the Government is committed to quality education through transparency and merit in admission (Wabudeya, B. Minister of State for Higher Education. 2003. Address at the Opening of the 14<sup>th</sup> JAB Selection 2003/04 exercise, 25<sup>th</sup> August, 2003, JICA Building, Makerere University), this suggestion, however, was never adopted though it would have worked towards better coordination.

#### **6.4.2 Registration and Enrolment**

The registration processes in different categories of educational institutions vary depending on the policy guidelines followed by the institution. As a national awarding body, UNEB registers candidates from all levels of education. Public universities are mandated by policy as the awarding bodies of their degrees, diplomas and certificate programmes and those of their respective affiliated and constituent institutions.

##### **i) Uganda National Examination Board (UNEB) registration procedures**

Given that Uganda National Examination Board (UNEB) plays an important role in the admission of students at all levels of education in Uganda, to a large extent its procedures determine the success of any student information system. Interviews with UNEB staff, coupled with a review of sample documents, indicated the following as the registration procedure:

- issuing of circulars for registration to head teachers or heads of centres;
- collecting entry forms from UNEB, showing full class list;
- UNEB provides requirements;
- capturing information from students, including photographs and allocating an index number;
- producing a student list and summary of candidates, with signed entry form;
- reporting the transfer and withdrawal of candidates;
- handing over list to UNEB;
- calculating how much the person has to pay. A receipt attached;
- physically checking the correctness of names of candidates and the total number of students;
- computer scanning, and printing the first draft;
- checking and making amendments;
- reprinting a correct list, and checking again printing the draft register together with a draft packing list for each centre, showing number of candidates for each subject. Head-teachers are requested to cross-check the final register for errors;
- sending the draft register to the centre with a circular for cross-checking;
- detecting and reporting error on another form collected from students;
- sending this form to computer and enter it manually;
- printing the final attendance register for exams;
- printing the attendance register in duplicates. The original copy is sent to UNEB and the other

- copy is sent to the school (centre); and
- at the time of selection for higher education, the files are merged arranged according to a student's performance.

According to one senior officer in UNEB, the same information captured regarding the centre number and candidate's details are used to print mark sheets and eventually the pass slip and the certificate. UNEB also ensures that candidates write the names themselves when filling in forms. According to UNEB, no new name should be used or added. No alterations or changes in names are accepted at registration. This helps when certificates are printed. Emphasis is placed on the consistency of the names used. According to UNEB, the names used at Uganda Advanced Certificate of Examination (UACE) must be the same as those on O-level result slips/certificates. UNEB ensures that the entry form shows whether a candidate is sitting for the first time (called a school candidate), is repeating, is a private candidate or a candidate who is blind.

## **ii) Registration process in Higher education**

The registration processes in higher education are the responsibility of the qualification-awarding bodies. All other tertiary institutions that are not affiliated to universities follow specific processes depending on the regulations of their Governing Council. The following processes are common in most of the institutions of higher learning.

**Table 6.4b Registration Process for Higher Education**

Processes	Parties involved	Inputs documents required	Information produced (output)
<ul style="list-style-type: none"> <li>Registration forms are designed by individual institutions</li> <li>Students present themselves at the institutions for registration</li> <li>Self-identification by students ID and admission form)</li> <li>Students fill in the form concerning academic and personal information</li> <li>Officers verify the academic and personal data</li> <li>They verify whether the students have met the entry requirements and, paid fees</li> <li>They ensure that students fill in forms appropriately and correctly</li> <li>Officers open a personal file for a student</li> <li>Students sign the register</li> <li>Officers issue the registration certificate to students</li> </ul>	<ul style="list-style-type: none"> <li>Universities</li> <li>Individual institutions</li> <li>Students</li> </ul>	<ul style="list-style-type: none"> <li>Registration procedures and instructions</li> <li>Registration forms</li> <li>Self-identifications</li> <li>Admission letter</li> <li>Receipts</li> <li>Birth, marriage, and academic certificates</li> </ul>	<ul style="list-style-type: none"> <li>Personal file</li> <li>Registration forms filled in and signed</li> <li>Registers</li> <li>Registration forms verified</li> <li>Registration certificates/cards issued</li> </ul>

Registration in most institutions is preceded by an orientation week to enable students understand the university's layout and culture. In addition to reading the instructions that are given to students at the time of admission, the researcher participated in an orientation ceremony on 22<sup>nd</sup> September 2003 organised by the ceremonies section of the Academic Registrar's office of Makerere University. The participation involved attendance by the researcher, ostensibly as a student with the rest of the students in the pavilion. The purpose of the ceremony was to brief students on the procedures that various activities at Makerere University follow. Various university officials spoke. Mr. E. Obella, the Deputy Registrar (Admissions), while describing the admission procedures, emphasised that students must identify themselves by IDs from their former schools. He asked them to read the instructions and understand them. He warned them to desist from forgeries and impersonation, and to register as bona fide students (Obella, E. Deputy Registrar, Admissions. Makerere University. 2003. Briefing of Students during the Orientation Programme at the Freedom Square. Makerere University, 22<sup>nd</sup> September). According to Mr. Lynd Tom Otim, the officer in charge of ceremonies and certificates, certificates show all one's names in full. He noted that an alteration in names is acceptable only if:

1. A student has been married: this must be backed by a marriage certificate;
2. A Student has changed one's faith: the chaplain or imam writes a letter in support and the student must produce an affidavit. (Otim, L. T. Assistant Registrar, Staff Development & Ceremonies, Makerere University. 2003. Briefing of Students during the Orientation Programme at the Freedom Square. Makerere University, 22<sup>nd</sup> September).

The names in which the student will be registered are those which appear on the student's O-level certificate and A-level results slip (Makerere University Academic Registrar 2003:11).

The researcher also reviewed procedures guiding registration at other tertiary institutions. For instance, the regulations for the award of a diploma in secondary education and primary education offered by various NTCs were laid down by the former Institute of Teacher Education, Kyambogo (ITEK), now Kyambogo University. Article 2 (2.2), specifies that 'candidates admitted to the programme shall be required to register as institute [ITEK, now Kyambogo University] students... for subjects they have been formally admitted to' (*Procedures for Obtaining Academic Transcripts for ITEK based Programmes* 2002). The NTCs determine the validity of documents and allocate registration numbers as determined by Kyambogo University.

#### **6.4.3 Procedures for processing of examinations information and obtaining qualifications and awards**

The interviews, questionnaires and participatory observation indicated divergences in methods of maintaining examination records. For example, Kyambogo University provides regulations for NTCs, while Makerere University Business School sets and regulates examinations for UCCs. The other sector-related tertiary institutions follow their governing boards' regulations as set out by the Ministry of Education and Sports. Although there seemed to be some differences in the processing of examination information, universities seem to have a common system, as shown below.

**Table 6.4c Summary of Procedures in Processing of Examination Information and Obtaining Qualifications and Awards**

<b>Process</b>	<b>Responsibility</b>	<b>Records required</b>	<b>Output</b>
Compile progressive assessment marks	Lecturers	Students list and attendance records	Coursework lists Certificate of due performance
Issuing exam cards	Registrar	Student register	Exam card Candidates signature
Conducting exams	Faculties	List of candidates	Exam scripts Exam attendance list
Marking of exams	Internal and external examiners Faculty/departments	Candidate lists Attendance lists Coursework lists	Mark sheets
Compilation of results	Faculty administrator	Mark sheets Student register Examination regulations	Comprehensive results Students' grades
Evaluation of the results	Faculty board	Comprehensive results	Minutes of the

		Mark sheets Examination regulations Students' appeals	Faculty Board Recommended results Pass lists
Approval of results	Awarding body	Minutes Pass lists	Approved results Graduands lists
<b>Qualifications and Awards Procedures</b>			
<b>Process</b>	<b>Responsibility</b>	<b>Inputs (records required)</b>	<b>Output</b>
<ul style="list-style-type: none"> <li>Students fill in a transcript request form.</li> <li>Officer obtains the student's personal file and a file containing the approved results</li> <li>Drafts or enters the results per semester and per year.</li> <li>Proofreads and then signs and stamps the transcript</li> <li>Issues the Transcript</li> </ul>	Academic registrar	Clearance papers from the departments, receipt payment for a transcript, personal file	A student obtains a copy of transcript filed in a student personal file.
<ul style="list-style-type: none"> <li>Graduation</li> </ul>	Senate/awarding body	Approved results Graduation lists Graduation book	Certificate
<ul style="list-style-type: none"> <li>Officer assembles student's records and processes certificates. The Academic Registrar (AR) and Vice Chancellor (VC) sign the certificates.</li> <li>Officer checks in the personal file if the student has been cleared.</li> <li>Issues the certificate</li> </ul>	Academic registrar	Personal student file, receipt of payment of fees for certificates, clearance form	Acknowledgement letter A certificate issued to student

For a student to obtain a transcript or a certificate from a university, emphasis is placed on the proper identification and authenticity of the ownership of the awards. For example, the notice board observation in Kyambogo University conducted on 5<sup>th</sup> March 2003 clarifies that a student collecting a certificate, requires:

- A letter from the local council acknowledging the fact that the person is a resident of the village.
- Authority letter from the guarantor addressed to the academic registrar, Kyambogo University.
- A covering letter from a country representative/ambassador/high commissioner or consulate etc acknowledging that the person being referred to is currently residing in a particular country.
- A registered document giving powers of attorney to the person collecting the document.
- A declaration by the person collecting the documents that should it be found out he/she didn't have authority of the former student to get the document; he shall face the legal consequences.

In fact, on 23<sup>rd</sup> and 24<sup>th</sup> September 2003 at Makerere University, the researcher observed the contents of the memos and notices on the notice boards at the Academic Registrar's Department. Students were supposed to check their academic transcripts before signing for them. A notice read that 'Any-body who takes a transcript bearing wrong grades and class of award does so at his own risk' (*Procedure for Obtaining an Academic Transcript* 2003). It was noted that, in spite of the existing number of channels to disseminate information about awards, there are still many

bureaucratic procedures in obtaining a transcript and/or a certificate from most universities. Such bureaucracy is meant for ensuring proper verification of student information.

#### 6.4.4 Verification of student information

Verification of student information is done throughout a student's life in a given institution, depending on the activities in which the student is involved, as shown in table 6.4d.

**Table 6.4d Procedures in Verification of Information**

<b>Purpose of verification</b>	<b>Responsibility</b>	<b>Inputs</b>	<b>Process</b>	<b>Outputs</b>
Registration	Institutions, UNEB	Academic documents, ID, original student results, UNEB forms and pass lists	Officer checks physically or scrutinises the documents, consult awarding body	Student register
Inquiries/ queries made regarding student information	Head of the institution	Requests from students or from institutions Students' files	Officer check available records concerning the issue or student. Officer checks the students files Officer checks with the former school or UNEB Officer checks if there is a debt Writes a verification report	A letter to confirm or disclaim Stamped and signed letters
Certification of Documents	Registrar's office	Photocopies and original certificates, receipts of payment	Officer checks graduation book Officer looks at certificate and fees payments Officer certifies the documents (stamp and signature)	Certified copies, signed and stamped copies.

Institutions that require verification write to UNEB and a reply is sent to that institution. For students who want to verify or certify their results, UNEB requires a letter of introduction from the institution accompanied by payment for a letter of verification and postage, a police statement, a current ID and the presence of the individual. Verification of results is also done when somebody loses a certificate. To avoid forgery, UNEB ensures that the Head Teachers or their Deputies/Directors of Studies identify themselves with school IDs before pass slips or certificates are issued to them. UNEB also ensures that the names used at A-level are the same as those used at O-level.

Although there are verification processes in universities and UNEB, some impersonation and falsification of documents still exist because there is no coordinated system to enable easy verification of student information in the country.

Implied in the review of the above processes is that there is no common procedure for identifying a



student in the country. Table 6.4e summarises the processes discussed above.

**Table 6.4e Summary of the coordination processes within the education sector**

Process	Coordination body/system	Other Parties involved	Outputs
UNEB registration	UNEB	Schools/centres	Student register
UNEB examination	UNEB	Schools/centres	Results lists, pass slips, certificates
Post-primary admission	MoES selection committee	MoES, UNEB, heads of institutions (schools)	Admission lists Schools make individual lists and give admission letters to successful candidates
Higher education admission	JAB	MoES, UNEB, public universities and other tertiary/institutions involved	Individual admission lists made Institutions allowed to carry out individual admission at schools
Registration in higher education	Awarding Institutions	Institutions, faculties, departments	Registers
Processing of exams information	Awarding institutions	Institutions, faculties, departments	Results, reports, pass lists
Qualifications and awards	Awarding institutions	Institutions, faculties, departments	Testimonials, graduation, transcripts, certificates
Verification	Awarding institutions	UNEB, schools (former)	Certification of authenticity

From the discussion above, it is clear that student information collected at various levels of education is not sufficiently coordinated.

Key informants in various institutions were asked to identify the kind of processes involved in performing their work that could be used in an effort to coordinate student information. The processes depended on the role of the organisations in the education sector. Table 6.4f shows some of the responses given:

**Table 6.4f Organisation/Processes Matrix in the Education Sector**

Organisati on	Process								
	Work plan	Standards	Inspection	Indicators	Assess ment	Coordinati ng	Visit & inform	Capture and Research	Reports
UNSA	X				/	X	+	X	X
Districts	X	+	X	/	+	X	+	X	X
MoES	X	X	X	X	+	X	X	X	X
UNEB	+	X	X	+	X	X	X	X	X
NCDC	X	X	X	/	X	/	+	/	X
NCHE	X	X	X	X	+	+	X	/	X

**Key:**

*X Major responsibility*

*+ Major involvement in the process*

*/ Some involvement*

Generally, the majority of institutions provide reports and work plans and are heavily engaged with inspections and standards. The table above also shows that coordination is a major function in the majority of the organisations, but not in all. For example, when a senior official of the NCHE was asked to explain the processes in coordinating student information and activities, he disclaimed any responsibility for coordination and said: ‘We have no such system. I don't know whether that one is our mandate’ (Kasozi, A. B. K. Executive Director, National Council for Higher Education. Personal Interview. 7<sup>th</sup> October 2003, Kampala). This indicated that, it is clear that efforts at coordination are inadequate.

## 6.5 Positive features of the way student information is currently managed in Uganda

The researcher asked administrators and key informants to indicate what they thought was most positive about the way in which student information was being handled by various categories of stakeholders. The X in the table 6.5a indicates that the explanation or features in the rows applies to the organisations indicated in the columns. The organisations indicated are the Ministry of Education and Sports (MoES), Uganda National Examination Board (UNEb), Districts (Dist), National Council for Higher Education (NCHE), Joint Admissions Board (JAB), Educational Standards Agency (ESA), post-primary education institutions (PP), and higher education institutions (H). The responses are explained in the sub sections below:

### 6.5.1 Fulfilling the education sector role

It was established from the study that various stakeholders have attempted to fulfil their role in their respective areas of jurisdiction.

**Table 6. 5a Fulfilling Education Sector Role**

Attributes	Organisations							
	MoES	UNEb	Dist	NCH E	JAB	ESA	PP	H
Enrolling students in schools	X							
Linking up with universities regarding admission	X	X			X			
Exchanging admission lists					X			
Coordinating students' activities in the country	X							
Ensuring standards in the education sector	X			X		X		
Career guidance and counselling	X		X					
Ensuring controls among the schools' operations			X					
Selecting students for universities					X			
Students admitted to avoid double admission					X			
Supervising teaching, learning process			X			X		

Ensuring record keeping in schools	X		X					
Many opportunities/ avenues being offered for higher levels of education	X						X	X
JAB selection being based on order of merit					X			
Setting admission standards that are adhered to by JAB and institutions to ensure performance in the country.					X			
Transparent selection					X			
Application form being quite dependable	X							
Inspecting of teachers and standards of institution and ensuring that materials are in institutions	X		X					
Liberalisation has enabled more students to access higher education.	X			X				X
Each District has a District Education Committee under the District Local Government Council to plan for education in the district.	X		X					
Providing facilitation grants for various education activities	X		X					
EMIS is able to capture statistics in the education sector in Uganda	X		X				X	
Ensuring academic standards in the education system in Uganda	X	X						

Various organisations have attempted to meet the education sector's goals. ESA and NCHE monitor standards and quality in the education system in Uganda. For instance, ESA has put in place a plan for an inspection system based on quality indicators. This involves training assessors and inspectors in terms of national, regional and district inspections, the one senior official in ESA explained. The purpose of inspection is to keep track of students' numbers and to be able to plan for them (Otyek 2003 [Otyek, Moses. Deputy Director, Education Standards Agency. Personal Interview. Kampala, 30<sup>th</sup> October 2003). Likewise, NCHE monitors the standards of higher education sub-sector in Uganda. A senior officer in NCHE explains its role as being only that of informing and advising Government (Kasozi, A. B. K. Executive Director, National Council for Higher Education. Personal Interview. 7<sup>th</sup> October 2003, Kampala). He added that the Council provides indicators of the quality of education. The efforts of the ESA and NCHE are not coordinated, however.

From the above discussion, it is clear that the expansion of higher education calls for better coordination. It is crucial to know which students are admitted to which institutions, and to ensure standards. This requires a system that will enable proper coordination of student information in the country.

### 6.5.2 Procedures and guidelines provided

The findings show that working according to set procedures has facilitated effective and efficient management of student information in Uganda.

**Table 6.5b Positive features of procedures and Guidelines Provided**

Attributes	Institutions				
	MoES	Dist.	NCHE	ESA	H
<b>Procedures and Guidelines Provided</b>					
Working through pre-set guidelines	X				
Setting policy guidelines that help education sector	X				
Requiring monthly returns (reports)	X	X			
Emphasising on the submission of work plan	X		X		
Working on rules and regulations					X
Setting rules and regulations to govern higher education			X		
Ensuring universities meet entry requirements			X		
The coming into being of universities and other tertiary institutions has helped	X		X		X
Ensuring inspection reports	X	X		X	
Providing regulation of standards of education in the country	X			X	
Universities have laid down procedures to guide their operations. The rules and regulations are in booklet form to help the universities to circulate the information.					X
Proper documents are required from students.	X				X

Most universities have clear and documented admission and registration procedures. This has enabled staff to avoid experiencing problems, unless they do not plan in advance. However, as one Senior Assistant Secretary in a university noted, there is a lot of liberty in handling various issues in the university.

According to students who responded to the questionnaire, the existence of rules and regulations in the institutions is a major factor in facilitating coordination of student information. The rules and regulations help students to:

- acquaint themselves with the new environment;
- plan how to conduct themselves and work within the limits of the administration;
- know their obligations and duties;
- ensure discipline, behaviour and professional ethics of students;
- promote students' morals and discipline;
- guide concerning what the college administration wants, guide students at the university;
- guide in keeping law and order.

Application requirements, circulars, fees structure, daily timetables, examinations, course outlines, guides as to what is expected of a student provide important information to students.

### 6.5.3 Available communication channels

The existing communication channels that help to coordinate student information in Uganda according to the administrators are listed in table 6.5c below:

**Table 6.5c Positive Attributes to the Communication Systems in Various Educational Institutions**

Positive attributes	MoES	Dist.	PP	H
• Radio programmes for schools.	X			
• Issuing of circulars by the MoES on pertinent issues concerning students.	X			
• The use of Notice boards.			X	X
• Suggestion boxes also help in dissemination of information in training institutions and secondary schools.			X	X
• In secondary schools, career guidance programme/talks are valuable channels of communication.			X	X
• Information from neighbouring schools’.			X	
• Communication between schools and the MoES	X		X	
• Universities coordinate their activities by internal and external correspondences.				X
• The orientation week offered at universities gives students information.				X
• The Ministry has an officer in charge of every function to provide educational data and statistics required.	X	X		
• Districts have various offices to deal directly with student affairs at various levels in the districts.		X		
• The availability of mail communication, telephones and the Internet facilitates sharing of information. • Assemblies in education institutions are held to address students concerning current issues.	X	X	X	X
• Each district, an office of special needs is established. • Teachers are trained in counselling skills to facilitate easy identification of student problems.	X	X	X	
• Representation of students in universities on various committees in Senate and council helps in the coordination of student information in higher education. • Student leaders are involved in the implementation of school rules and regulations, i.e. student leaders use a student-to-student approach in the dissemination of information and problem-solving. • The Uganda National Students Association (UNSA) coordinates students’ activities in the country.	X	X	X	X

Some of the comments on various channels of communication indicate free access regarding student information. Although student leadership is represented at various levels, there is hardly any attempt at coordinating student affairs within the educational institutions. UNSA only deals with cases of complaints, and no effort is made to keep track of a student. The available channels of communication lack a strategy to coordinate student information in the country. The form in which student information is captured, stored and coordinated is not standardised.

#### 6.5.4 Coordinating student information



It was established in the research undertaken that at present no institution is solely responsible for coordination of student information in the country. The following attempts at coordination have been made:

- The Uganda National Student Association coordinates information about student affairs in the country.
- A central information data bank on institutional statistics is being created through EMIS. This helps the Ministry of Education and Sports to compile information about all schools, which helps it to generate annual enrolment records and statistics. It coordinates with the districts as the focal points in the implementation of the education information system.
- The Ministry has standardised forms for applications to higher levels of education.
- The consolidated result book for A-level and O-level produced annually by
- JAB constantly links up with schools, universities and UNEB.
- The MoES provides lists of talented sports players at A-level. This makes the work of talent identification easy.
- Universities and other tertiary institutions are supplied with background information about students.
- Internally in each university, faculties are represented in Senate.
- The Vice Chancellors' and Academic Registrars' Forum has engaged in consultations and discussions on the strategic directions of the higher education in Uganda
- Other tertiary institutions, especially NTCs, have a Directors Forum that helps to coordinate all NTC activities.
- ESA's structure, decentralised to regions and districts, coordinates student information.
- UNEB links up with various government departments, universities, other tertiary institutions and schools.
- The decentralised structures help to collect data at various levels. Most development programmes are based on district needs via decentralised capacity development programmes.
- The coordination of the MoES and local governments with institutions includes finances for the institutions.
- The Consortium of Uganda University Libraries (CUUL) can allow registered students of sister institutions to use the interlibrary lending scheme.

Interviews conducted among the key informants showed that the existence of JAB helps to avoid duplication by providing a single coordinated admission list for higher education. Although JAB does coordinate, some respondents expressed reservations. One informant expressed that coordination in his view was haphazard. A student might be admitted to both Makerere and

Kyambogo, which should not occur. Comprehensive student information is required for coordination to be useful for proper identification. In a focus group discussion with Kyambogo administrative staff, a reference was made to the fact that a District Education Officer in Bushenyi once made an attempt to put in place a form to collect information, and a combination of academic and other variables about a pupil [student], but it was interpreted that he had been trying to make money (Focus Group for Administrative Staff, Kyambogo University. 5<sup>th</sup> March 2002).

The researcher attempted to follow up a report that had been made by the former DEO of Bushenyi. It was established that the form he had developed was no longer in use. This form had been designed to capture names of pupils, school, parish, sub-county, county, gender, date of birth, parent, and occupation of parents. Although this form captured details about a student, it was limited to one district and to the primary level only. This attempt to capture details about students was unfortunately not coordinated with any others.

To establish how UNEB coordinates students' information in Uganda, key informants were interviewed to comment about how UNEB coordinates its outputs with those of other institutions. Table 6.5d shows the different ways in which student information is coordinated by UNEB:

**Table 6:5d Coordination of Students Information by UNEB**

<b>Institution</b>	<b>Information coordinated</b>
MoES	UNEB helps to analyse data according to various characteristics. UNEB provides statistical information on districts and a breakdown of results, for example, the best 5 in districts, and the best 100 in the country.
Other tertiary institutions	Receive copies of results in printed form during selection exercise by JAB from UNEB. UNEB sets some exams for tertiary institutions.
Universities	Universities receive hard copies as well as electronic data. Some of the data is recorded on diskettes.
Schools and /or centres	When there are queries arising from the results, schools through head teachers write back to UNEB.

Findings from UNEB showed that, as a part of its daily routine, it communicates with schools, MoES, and higher education institutions. UNEB keeps data of all students who have ever written examinations it sets. To facilitate verification of a student's information, annually, UNEB produces a list of candidates who have passed in that year and gives a copy to schools. Because the process of registration is an important factor in the identification of a student, UNEB ensures students are identified in registers.

Despite the attempts towards coordination of student information, some respondents are not convinced of their effectiveness. One remarked that coordination had not taken effect. Another asserted that coordination and sharing were only done in circumstances that are clearly ad hoc.

### **6.5.5 Keeping records**

Proper record-keeping reflects a good student information system. The points below illustrates some positive attempts at record-keeping in institutions:

- keeping records concerning teachers;
- the MoES maintains that institutions should continuously submit records to the Ministry;
- the existence of a records office in the District education office;
- UNEB has security facilities for records;
- Universities have in place established registries, and information about students who pass through public and private universities can be accessed;
- systematic keeping of files of records was also reported in training institutions, for easy access and retrieval of information;
- student can be easily followed through his entire educational career using student files (records); and
- institutions have continued to keep records of students in files.

UNEB possesses effective security facilities for keeping records. One head teacher observed that UNEB possessed all the results of students who had registered as far back as 20 years previously.



Although universities have registries that can be accessed, it was found that it takes time to access information, especially at Makerere University. The Director of Studies of one secondary school remarked that schools maintain files on their past students, and that it is easy to identify students in a secondary school. Schools provide correct statistics for that is good for planning purposes. It is very easy to get information on the history of a student. Files sometime help in monitoring the discipline of students and supply information to colleges or schools. Responses during the interviews conducted among the key informants, however, indicated the current system of record-keeping was too dependent on paperwork.

Respondents did acknowledge some of the efforts that some schools have made to keep records about enrolment and attendance. During focus group discussions, the following observations were made:

- ◆ When UNEB issues certificates at a given level, copies are kept by UNEB.
- ◆ Information is properly kept because when it is needed, it can be easily retrieved. For example, it is possible to serve students from the 1970s.
- ◆ The names of students are arranged alphabetically at institutional level, and it is very easy to access the name.
- ◆ Student records are kept in many colleges. There are records of marks, attendance, and class lists.
- ◆ In institutions, there are registries where student files are kept, containing mostly biographical data, academic background and results. Other information such as that that regarding sickness, permission, discipline issues, leadership positions held and student's academic performance regarding is accumulated as a student progresses.
- ◆ When a student is admitted to a university, he is given a registration number, which he retains. He can easily be traced using that number. When students graduate, there is a record in a form of a book, which contains all their names.

These records do not contain a complete profile of student information. No strategy is yet in place to coordinate student information kept in various locations.

#### **6.5.6 Identification and access to student information**

A proper identification system is required for access to student information. Different institutions have not standardised their identification systems, however. The levels of security and protection

required to safeguard information affect easy identification and access. Accessibility depends on the form in which the information is stored. It also depends on the controls in place, as there are varying rights associated with the type of information sought. The following are some strength attributed to educational institutions and UNEB regarding the extent of access to and protection of information, during the interview.

Despite the following attempts, no agreed procedure and standard guidelines have been formulated for the protection of student information in all institutions.

- ◆ Most institutions make use of passwords to access computerised student data.
- ◆ Only authorised people may access records.
- ◆ Students are normally required to provide full details about themselves.
- ◆ In most institutions, many of the records offices are kept locked, and have security guards. In a few institutions there are lockable filing cabinets. Some other institutions keep student information in strong rooms.
- ◆ There are security checkpoints to stop theft.
- ◆ In some tertiary institutions, the integrity of the officers has been relied on.
- ◆ UNEB has a mechanism to detect anomalies, if for example the gender of a candidate is not recorded or results are confused.
- ◆ Many institutions are in the process of computerising student information to ensure easy storage and access.

### 6.5.7 Maintaining a student register

There are certain bodies that have made attempts to maintain a student register.

**Table 6.5e Maintaining a student register**

Attribute	MoES	UNEB	Dist.	P	H
UNEB arranges results that JAB uses for selection.		X			
Student information of UNEB is coded and it is therefore easy to share and retrieve by computer.		X			
Standardised forms to capture information are used by UNEB to create a register of all candidates who sit UNEB examinations. The registers help to ascertain the details of student		X			X
JAB also provides a register of short listed candidates to tertiary institutions		X			X
UNEB and universities code most information on students in special, standardised coding sheets.		X			X
District education offices emphasise that schools must keep registers and cumulative cards on a termly basis.	X		X	X	
In addition, schools keep student report forms in duplicate and lists of students.	X		X	X	
One of the control measures of the teaching profession is to establish a national register of all teachers trained, qualified and practising in the country. This helps the MoES to know their status and to follow up those with problems.	X				

On 18<sup>th</sup> February 2004, the researcher participated in a meeting concerning primary and secondary

school registers and Educational Management Information Systems forms. The meeting was attended by District Education Officers (DEOs) from the current 56 districts in the country, and was conducted by ministry officials from the Departments of Educational Planning, Primary and Pre-primary Education and Secondary Education. The issues of school registers, school mapping and school censuses were discussed. The Minister of State for Primary Education, Geradine Namirembe Bitamazire who officiated at the closing function, noted that registers in all schools in the country would help to trace class attendance, health status, and dropouts (Bitamazire, G. N. Minister of State for Primary Education. 2004. Address to the Press Conference during the closure of a one day Sensitisation Seminar of School Register. Hotel Africana, Kampala, 18<sup>th</sup> February). According to Bitamazire, this would help to improve standards in schools and in the country at large. Part of her address to the press conference is attached in Appendix 6.2. The Minister acknowledged that there had been problems in identification of students. During the same meeting, the researcher interviewed one Municipal Education Officer, who noted that a register would help to establish the retention, dropping out and the movement of students, to establish and update enrolment in schools, to keep track of a student's attendance and relate it to performance. According to that education officer, it would also identify teachers who did not attend class, as they would not mark the register. (Epiri. Municipal Education Officer, Arua. 2004. Personal Interview. During the closure of a one day Sensitisation Seminar of School Register. 18<sup>th</sup> February, Hotel Africana, Kampala.)

#### **6.5.8 Computerisation of student information**

The following factors may be noted:

- In the past few decades, the MoES has attempted to computerise its activities and operations. The Ministry has also more recently provided computers to some schools to improve on their operations.
- UNEB has computerised examination processing since the early 1980's, and all student information kept by UNEB is computerised.
- Many universities have also attempted to computerise operations. All universities have Internet facilities, have employed database managers and clerks, and possess centralised databases in one way or another. For example, through its Directorate of Information and Communication Technologies (DICTS), Makerere University is implementing the Academic Registrar's Information Systems (ARIS). Since 1999, Kyambogo University has kept some of its records on computer. The University has a data bank to enable tracing of student information. Mbarara University of Science and Technology is working on a databank of present students and alumni.
- Educational Management Information System (EMIS) constitutes the core of information management in the MoES. It captures information on student enrolments in schools. It helps to

check how the school is run, how many children there are, how many dropouts, and the operations of the head teacher.

There is a trend in various institutions towards computerisation of activities with varying degrees of success, but no agreed strategies regarding standards and coordination are yet in place.

It was established that there was widespread ignorance about EMIS and how it operates. For example, one Education Officer at the district who had spent two years in office expressed ignorance when asked about EMIS. A number of programmes are in place at the districts to enable effective capturing of student information. The Deputy City Education Officer of Kampala City Council for instance, explained that there was an annual education census for the MoES. Head teachers were trained to fill in these forms, which were then handed back to the Ministry.

The structure of EMIS assists in establishing statistics about student information in the country. However, it lacks a strategy for capturing an individual student's information. It is therefore not able to keep track of student information. In addition, there is ignorance about its use and the coordination of student information in Uganda.

During interviews, it was observed that the current system generates statistics about different attributes of a student. The Deputy City Education Officer for Kampala explained that the monthly returns helped to verify school enrolment, the payroll, and to determine the staff required in schools. One respondent from the Educational Planning Department of MoES remarked that, they tried to be up to date but lacked personal records about students. This is largely because, in the researcher's view, there is no system for keeping track of student information.

## **6.6 Challenges for the coordination of student information in Uganda**

Attempts were made by the researcher to identify the challenges in the coordination of student information in Uganda. Both the questionnaire for administrative staff and interviews with the key informants were applied to investigate the problems that respondents face while handling student information in the course of their work.

### **6.6.1 Problems faced in management and coordination of student information**

The following problems were established.

**a) Inconsistencies in information provision:** Findings indicate that sometimes students' details are mixed up. Changing names, and divergences in the names used by a student from time to time have caused inconsistencies. Sometimes mis-spelt names do not tally with those on certificates. Swapping of index numbers may occur. There are cases of inconsistency in student particulars, e.g. variations in dates of birth are common among the various institutions.

**b) Poor coding of information:** There have been cases of wrong information filled in on various forms due to inadequate coding used. In UNEB, for example, it was identified that there are cases where head teachers bring in forms where names of students have been poorly filled in. Sometimes forms are submitted late to UNEB, which allows no time to check them properly and rectify errors. This has been associated with a poor coding system, lack of standardised formats for storage and uncoordinated procedures that have caused duplication of data and activities in the education system. There is no standardised format for capturing and storing data collected, as some administrators observed. Respondents also pointed out that there were no guidelines that cut across institutions.

**c) Lack of documented information about a student:** It was observed that sometimes certain students fail to identify themselves when requiring service in universities to prove that the information they have provided is correct. This occurs when students cannot produce identity cards to back up their identity.

**d) Inadequate linkages, duplication of efforts and delays in communication** have hindered effective coordination of student information and activities. In some cases information does not arrive at the correct time. For example, it is difficult for diploma holders who want to continue with further studies to give proper information about their previous studies. The required information is scattered in the various institutions where such a person studied

**e) Failure to verify a student's information:** It was observed during the research that some people passed their documents to other persons for use. In addition, there are many cases where original documents cannot be accessed for proper verification. No standard format is used to request or certify verification. Each institution uses its own procedure. For example, in universities, the task of verification is a function of the Registrar's office. Though universities are given copies of Uganda advanced certificate of examination (UACE) results, often all cases that require verification are sent back to UNEB. There are cases of forged information—of presenting false documents such as receipts and academic documents, and of cheating and impersonation.

**f) Too great volume of records:** Much time is spent in searching pages of student records. Sometimes the required information is misplaced. Often, mostly in secondary and training institutions, heads of institutions, who may at times be unreliable, are relied on for information. Some administrators inflate the numbers of students in order to receive a higher capitation grant. The fact that there is no central place to handle student information in the country has hampered effective compilation of statistics.

**g) Lack of accountability regarding student information:** In the majority of institutions, there is no expertise to produce various statistics. It was also established that many institutions rely on the data about students and do not generate statistics about student information. Failure to disseminate effective statistics in most institutions has been attributed to the lack of appropriate hardware and software. The delays have also been linked to difficulties in collecting data from relevant sources. Inadequate sources have limited access to information. This has affected proper accountability regarding what happens to a student. For example, there is no entity to hold responsible if information is misplaced, or misused. According to respondents, the statistics available do not tally across various departments in an institution.

**h) Lack of access to student information:** The following main problems concerning access were observed:

**(i) Time wastage in accessing information**

From the research, it was clear that some of the problems that occur are created during the processing of student information. One respondent remarked that UNEB should itself take responsibility for this confusion. In addition, as the Executive Director of NCHE noted, that if one wants to know who has completed a degree in Makerere University, one has to go through publications and graduation programmes, which is cumbersome. A senior assistant secretary of NCHE added that at Makerere University, when students went to academic Registrar's office, they did not receive their results, though faculties had sent the results through (Senior Assistant Secretary. National Council for Higher Education. 2003. Personal Interview. 6<sup>th</sup> October, Kyambogo).

According to the research, it is not easy to locate a student once he has graduated or left school. The Deputy Director, National Curriculum Development Centre (NCDC) observed that tracking of students is impossible due to the large number of schools in the country. One ESA Official noted

that students are known by age or tribe but not by name. According to him, only information on a batch of students who are passing through once or who are in transition is known (Otyek 2003).

As part of the research, a survey of records centres of the four institutions visited, and an in-depth observation of operations of those centers was made. Four records centres were visited: one in a secondary school, one in a training institution, one in a tertiary institution, and one in a university. In some instances certain files requested could not be accessed. In a secondary school visited, the Director of Studies performed the registry function while the secretaries are responsible for filing and retrieving student information. The tertiary institutions visited employed a records clerk who keeps custody of student records. Universities had separate sections for records in the registrar's office.

### **(ii) Delays in receiving vital information**

The study also sought to establish how easy it was to access information. On the whole, it took a long time to access a file in most of the educational institutions but eventually one could do so. It was noted that files have an identification number. In most institutions, the student registration numbers were used to identify the student files. Registration numbers given reflected the year of registration and the programme of study in the institution. Cross-referencing emerged as a major problem in trying to link a student's file with other files that contain the same student's information. During the research, some students complained about delays in processing transcripts. The problems were associated with poor coordination between the faculties and the Academic Registrar's office. One student asked how the staff in records centre could say she had not completed a paper when she had been allowed to graduate.

### **(iii) Distortion of information**

The researcher established that there are many cases of alteration of dates of birth on student's files. At the moment, there is no standard procedure regarding who should access information. It was established that sometimes students are asked to take their own files from one office to another and it is possible to make changes without the knowledge of the officials. In many cases files are open to the public. It was also established that the available methods of storage are cumbersome. Data is manually recorded and stored. Generally, the lack of proper storage systems has contributed to delays in passing on of information. Storage space is characterised by crowding; fragile storage materials (paper quality and strength) are threatened by termites, water leakage through roofs and cockroaches. The researcher also observed cases of a lack of staff trained in records management.

These factors have limited the level of utilisation of existing records by the institution and its staff. A lack of computerisation has also limited effective access and use. In an interview with the Deputy Principal of an NTC, the situation was explained as follows:

- Storage and retrieval systems are generally poor.
- It is very easy to create keys for strong rooms, even if there is strong burglar proofing.
- Documents may be removed from files. (Ndiwalana 2003) [Ndiwalana, E. W. K., Deputy Director, NTC Kaliro. 2003. Personal Interview. Kaliro, 16<sup>th</sup> September]

Hence, some student information is lost completely. Some vital information is never filed by the senior personnel responsible.

In sum, the research showed that there are various delays and problems in accessing information from relevant sources. The majority of the students indicated that access to information was the major hindrance to coordination of student information, and that a lack of procedures to access information has affected the security and protection of information. The students who participated in the study believe that there is lack of privacy in the handling of some information such as in the releasing examination results. It was established that the marks of students are often given to class teachers who expose weak students in the process of checking for the marks of others. Students also cited malice and dishonesty, and lack of integrity amongst lecturers who might tamper with student information. This has resulted in the loss of data.

There are also limited resources in terms of personnel and space. These limitations coupled with manual operations, large numbers of students and understaffing have hampered the effective delivery of services in education institutions as the responses from administrative staff suggest.

Students complained that some of the officers in charge of the records are not customer-oriented. One student from a UTC noted that since students do not have any student representation on the Board, at times resolutions are passed which affect the students' welfare. Some of the problems that affect access include:

- In many cases administrators do not provide information to student leaders. This affects them later in delivering the required information to the students.
- No proper coordination between students and administration.
- Administrators are reluctant to assist students when they are in need.

The UNSA representative commented that there is a relationship gap between the administration and the students. He associated this with lack of customer care. During a focus group discussion, student



leaders at Makerere University raised similar concerns to the above.

### **6.6.2 Consequences of failure to coordinate information**

In a questionnaire administered to administrative staff, they were asked to mention cases that have occurred due to the failure to coordinate student information in Uganda. An interview was also conducted with key informants from various organisations in the education sector. Several issues emerged, which included:

#### **a) Enrolment problems**

- Students failing to be allowed to upgrade to degree studies because their certificates cannot be traced from the awarding institution and the college where they studied.
- Some students are admitted to more than one institution. There are cases where students can pursue two different courses in two universities on a government sponsorship at the same time.
- In 1998, certain students almost missed university entry because the district office failed to coordinate information.
- New students have sometimes arrived on campus without knowing the halls of residence to which they are attached.

#### **b) Uninformed decisions**

- Some students have been deregistered from Makerere University, only to discover later that they should not have been.
- Certain candidates have graduated and received their transcripts when they should not have done so.
- In an NTC, there was a case of a student being admitted as a self-sponsored student but later he claimed he was a Government student. Records showed that he was indeed a Government-sponsored student.

#### **c) Communication problems**

- Observations by staff members of schools and one Ministry official described that a lack of communication between administration and MoES had led to a number of strikes in schools.
- There are cases of ineffective communication within the institutions themselves. In one case when the MoES provided lists of students talented in sport to the Academic Registrar's Office of Makerere University, the University Sports Department was not given a copy of those lists. This made it hard for the department to monitor the performance of the students admitted on the sports ticket.

#### **d) Inadequate record-keeping**

- Some lecturers claimed that the students did not do their assignments because the former did not have their names and marks, and yet the students had their scripts to prove that they had actually done the work.
- There were cases of under payment of the capitation grant owing to incorrect enrolment statistics.
- There were also cases of late payments of allowances to students owing to inadequate

information on their registration status.

- Sometimes a student is registered but the bursar's office fails to reconcile the fees payment records, and lists them as fees defaulters.
- Lack of records to back up disciplinary decisions was noted.
- Sometimes a student arrives with a letter from the headteacher of his former school. On the strength of that the person is admitted, only for the institution to discover later that he did not qualify.
- A college was phased out: its students were transferred to another college but no records were transferred.

#### e) Impersonation and forged documents

- One case of impersonation involved a student claiming to have lost a result slip and demanding a document from the school to pursue the matter with UNEB.
- There are also cases of impersonation where students have used other people's certificates to gain admission to universities. One senior officer from UNEB expressed shock at the level of impersonation, where in the past, some boys had put on dresses to sit examinations as girls (Bukonya, M. B. B. Executive Secretary, UNEB. 2003. Personal Interview. UNEB Offices, Kyambogo, 15<sup>th</sup> October).
- On occasion, institutions write to UNEB to verify the results of those who have applied, but when the record is checked, some cases are proved to have been forged.

The majority of the respondents cited the following reasons as the major causes of examples of impersonation and forgeries:

**i) Greater demands for higher education and employment:** It was established that the rising standards of living in the country are forcing people to use different strategies to continue with further studies. This has contributed to forgeries being made of academic documents, as people want to use qualifications, which are not theirs, to gain entry into higher education institutions or to compete for political posts.

**ii) Morality in Uganda is diminishing:** The '*mafuta mingi*'— [A name given to those unlearned people who became wealthy instantly in the 1970s] brought dishonesty.

**iii) Misuse of Technology:** With information and communication technology, people have become very much smarter, commented one deputy director of NTC with amusement. According to him, technology has worsened things.

**iv) Cheating has been institutionalised:** Students try to take shortcuts. The displeasure of parents when children fail has contributed to this. According to interviewees, people who create forgeries often occupy senior positions in the education sector, including head teachers, and education officials some respondents noted.

In the interviews, various attempts to address impersonation and forgeries were identified, as shown below.

- **Validation exercise:** It was established that every year, the districts conduct a validation exercise. When forgeries and impersonations are identified in districts, perpetrators are summonsed; some of them are dismissed or suspended. Validation involves investigating the qualifications of teachers and where they studied.
- **Use certificates with photographs:** The Ministry keeps on updating methods of handling impersonation and forgery cases. It was noted that people who forge documents keep on changing their techniques of doing so. It was established that UNEB is proposing to issue certificates with photographs.
- **Ensure availability of data:** A respondent from the Ministry praised UNEB because of its ability to store facts about a student, and said that whenever information is needed it is obtained. UNEB releases certificates to students and they become personal property. Such certificates are recognised at all levels (national and international). In cases of impersonation and forgeries, the role of UNEB is to prove that the results are forged or their lawyers have to attempt to prove that one person has impersonated another one. UNEB keeps a record of students' signatures during examinations, and when collecting certificates. Higher education institutions too require certificates from the students registering there. For example, Appendix 6.4 shows a circular obtained from a notice board on the subject of the cancellation of admission and revocation of Makerere University Awards.
- **Appeals:** According to a senior official within MoES, it usually appeals to the public to be on the alert and in many cases the public has helped in reporting such cases to the authorities. It was also noted that the Ministry advises head teachers to be more careful in handling student records.
- **Liaison with police:** It was noted that UNEB works with the police when cases are reported for investigation. All culprits are handed over to the police. During examinations at all levels, UNEB usually hires scouts. If a student is caught cheating, he is arrested. There have been endeavours to train invigilators and supervisors to handle cases of impersonation and forgeries.

This was summarised by a Senior Assistant Secretary in the NCHE who noted that impersonation can only be managed and reduced, not eliminated. The Head of Mobilisation in UNSA commented that impersonation and forgeries were condemned, as other organisations also did. According to one interviewee, raising standards does not stop people who want to succeed from circumventing them.

One interviewee noted that unless the system is watertight, people will get around it.

### **6.6.3 Existing gaps in the management of students information**

The researcher sought to establish the gaps in the management of student information that have limited the coordination of student information. All respondents were asked to indicate what they thought was lacking in the current system.

#### **a) Lack of consistent and accumulated records to identify student information**

Research findings indicated that respondents at institutions are not sure of the information stored. For example, it is not clear how to ascertain the status of an orphan in most institutions. Similarly, it is not easy to track the special interests of students, due to unreliable documentation. According to the findings, there is no system that captures student information right from the beginning in order to keep track of it.

There is no accumulated record (national register) of students at the Ministry. According to the findings, the current system does not provide a profile of a student as he progresses through the system.

#### **b) Inadequate coordination of student information**

It was evident that there is no agency responsible for coordination of student information in the country. One deputy director in an NTC commented that the MoES does not seem to coordinate information from NTCs. Likewise, there is a lack of coordination between UCCs, NTCs, and UTCs and there is no linkage between various systems in those institutions (Ndiwalana 2003).

#### **c) Inadequate standards for management of records**

It was observed that lack of records management standards has meant that information is not properly stored or tracked. For example, varying formats are used by UNEB, JAB, universities and schools and the MoES. Accordingly, there are no agreed standards for record keeping in educational institutions. The majority of respondents therefore emphasise the need for proper record-keeping and improved records management systems.

#### **d) Inadequate management structure to facilitate the coordination of student information in the country**

It was clear from the research that, although the Ministry has formulated a policy that students should be represented on management committees so that they are aware of what is happening in an institution, such representation of students has not been effected, as the majority of students remarked. It was also noted that the current education system in Uganda is silent on the rights and responsibilities of a student. According to one Deputy Director of an NTC, there is a gap between higher education and secondary schools. Because there is no linkage between the various levels of education, institutions in many cases meet the same problems over and over again.

At the same time, there is no machinery to follow up those students that leave higher education for the employment sector. This has limited the way in which higher education institutions can strengthen and improve any weakness that exists.

In addition, there is a lack of adequate career guidance in educational institutions. This is linked to the training of teachers (educators), according to some respondents. There are also cases of a lack of clarity about who is responsible for what information in various institutions at all levels in the sector. For example, as noted by one Education Officer, although he is responsible for monitoring business, technical, and vocational education training (BTVET), the Ministry is not concerned with the syllabus being followed in farm schools.

#### **e) Inadequate financial and technological support**

The research indicates that it is very difficult to calculate the unit cost per student in Uganda. The majority of the responses show that there is inadequate financing in most institutions. In addition, a lack of sufficient infrastructure has contributed to poor access to information. There are costs involved in the production of reports for students and provision of services. There are cases of overlapping of activities, so that delayed funding of activities affects the operations of the institutions, as was pointed out by one Senior Assistant Registrar interviewed. The majority of responses associated inadequate coordination of information with lack of adequate funding. This was in spite of the fact that institutions are computerising information. The head of mobilisation at UNSA also noted that the major problem in running institutions is a financial one. The district and ministry officials who participated in the study also confirmed poor support: one noted that at times

there are no resources to finance the work.

There are also limited resources in terms of personnel, and limited space. These factors, coupled with manual operations, large numbers of students and understaffing have hampered the effective delivery of services in education institutions, as the responses from administrative staff suggest.

#### **f) Lack of adequate interest, involvement and political will**

The majority of the responses showed that the lack of trained personnel in most institutions has contributed to poor records management. Interviewees' responses show that ICT is not widespread, as in many cases there is no commitment to it among managers. The Deputy Director of NCDC feared that changing to something new would be difficult (Kamya, S. H. Deputy Director, National Curriculum Development Centre. 2004. Personal Interview. Kyambogo, 3<sup>rd</sup> February 2004). It was noted that even if policies are laid down, sometimes political will and advocacy to ensure their implementation are lacking

#### **g) Lack of policy guidelines in the management of student information**

Rules and regulations governing student information are lacking or out of date in most institutions. The research also showed a lack of confidentiality and transparency in the way student information is managed in Uganda. According to the views of administrators, students do not respect regulations and procedures. For example, students do not pay timeously. There are also cases where the objectives of the institution and students are in conflict. The majority of students associated poor access to student information with bureaucracy and unclear policy guidelines.

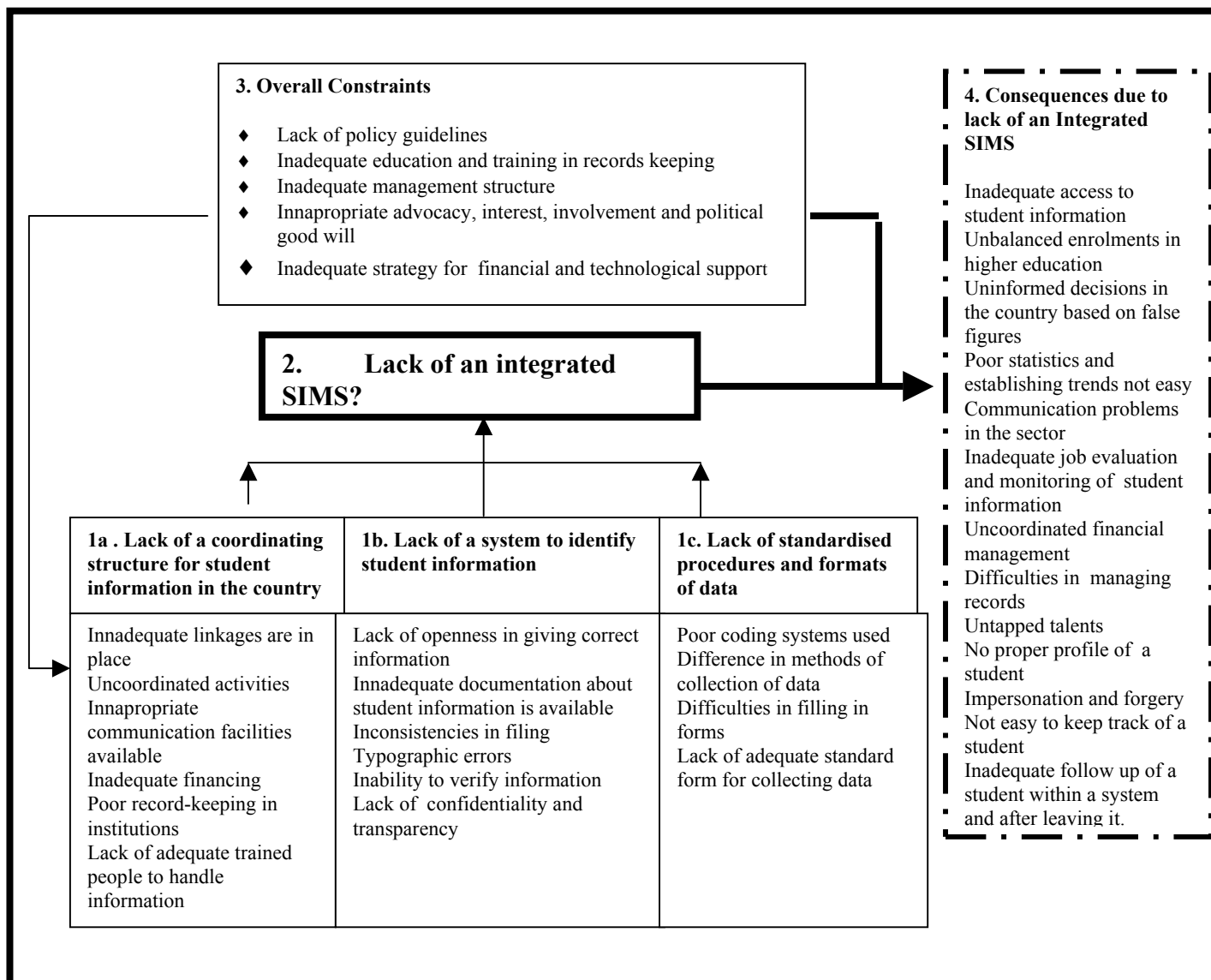
#### **h) Inadequate education and training in records keeping**

The majority of respondents indicated that lack of adequate training in records management is a serious problem. One district official, for instance, noted that most head teachers are appointed without basic knowledge regarding management of records in schools, and yet are expected to keep student records. It was also noted that there is inadequate knowledge about the importance of records and of tools and facilities to store and manage them.

The absence of a strategy for integrating student's information in the education sector and reforms has limited the following up of, and ability to keep track of, this information. Figure 6.2 summarises the problems, gaps and consequences into a problem tree network.

[Bestpfe.com](http://Bestpfe.com)

**Figure 6.2 Problem Network for coordination of Student Information**





## **Description of figure 6.2**

Figure 6.2 summarises the current state of the coordination of student information in Uganda. It was observed in this chapter that there are problems in the management of students information (Box 1). These problems include the lack a coordinating structure for student information in the country (Box 1a), the lack of a system to identify student information in the country (Box 1b) and the lack of standardised procedures and formats for data (Box 1c). These difficulties come about as a result of existing constraints (Box 3) due to lack of a strategy for an integrated SIMS (Box 2) in Uganda. The absence of such a strategy has limited followup, and the ability to keep track of this information among other data, as shown in Box 4. The thick arrow from Boxes 2 and 3 to Box 4 shows the problem in the SIMS in Uganda that calls for a design strategy.

## **6.7 Conclusion**

From the research undertaken, the different types of student information kept by different institutions depend on the purpose for which it is kept, with some attempts at sharing of such information between institutions. The various processes in coordination of student information depended on the policy guidelines provided at the institutional levels. The research also established that it is thought effective for institutions to attempt to fulfil their educational role with limited policy guidelines to facilitate easy coordination.

It was clear that the absence of a strategy for integrating student information into the education sector and reforms have limited the ability to keep track of student information in Uganda. An integrated SIMS to keep track of student information, with distributed access points, is required.

## CHAPTER SEVEN

### NEEDS OF AND REQUIREMENTS FOR A STUDENT INFORMATION MANAGEMENT SYSTEM FOR UGANDA

#### 7.1 Introduction

One of the important challenges of higher education is how to design a strategy for an integrated SIMS. This requires a clear definition of the needs of and requirements for such a system. In Chapter Six, the state of coordination and management of student information in Uganda was discussed. In that Chapter, it was established that the lack of an integrated SIMS has limited the ability to manage such information. In this Chapter, an analysis of research problem II: ‘What are the needs and requirements for a SIMS in Uganda?’ is provided. In order to answer this question, the research identified expectations amongst respondents regarding the importance of coordinating student information. Furthermore, the research identified respondents’ reservations, the resources needed to be in place, and the most cost-effective way of coordinating student information. Factors that could facilitate keeping track of student information in Uganda were also established.

Data was obtained by means of a questionnaire for administrative staff (A), oral interview guides (B), a questionnaire for students (C) and focus group discussions (D) as explained in Section 6.2. In order to offer a coherent analysis, the chapter systematically analyses and presents each research sub-question separately. For each question, mention is made of the instruments used, and the results received are presented. The analysis in this chapter follows the same method explained in Section 6.1. For purposes of ensuring the ethical nature and authenticity of research results, unless otherwise stated, the researcher preferred his respondents to stay anonymous as already noted in Section 6.2.7.

#### 7.2 Importance of coordinating student information in Uganda

One of the issues investigated was to establish the importance of coordinating student information in Uganda as perceived by respondents. The responses of Administrative Staff (A), Interviewees (B), and Students (C) in table 7.1 below illustrate various reasons for this.

**Table 7.1: The Importance of Coordinating Student Information**

<b>Importance of coordination of student Information</b>	<b>A</b>	<b>B</b>	<b>C</b>
To reduce the inequalities in the education system (e.g. urban-rural imbalances)	2	1	3
To avoid duplication of efforts (reduce data redundancy)	1	2	3
To reduce unnecessary expenses	2	1	3
To eliminate wastage of time in accessing student information	1	1	1
To facilitate career development, counselling and guidance (directing a student to the right programme)	2	2	1
To enable easy identification and development of students' talents, potentials and abilities. To facilitate proper identification of students' information (identity, physical address and citizenship)	1	1	3
To facilitate easy tracking of student information (knowing who is who). To create a clear record and build up a student's profile/history. Ability to track a student's movement in the system. To enable tracking of performance and academic growth	1	1	4
To facilitate easy verification and certification of students' information. To reduce chances of forgeries, impersonation and enrolling ghost students	1	1	3
To enable provision of reliable statistics for effective decision making and forecasting	2	1	4
To enable effective planning for purposes of quicker decision making	2	1	3
To achieve improved standards in the management of students' information for better retrieval of data	2	2	2
To promote uniformity (data and procedures) in the management of student information in the country	1	2	3
To facilitate educational management functions and operations (e.g. enrolment, awards)	3	1	3
To facilitate improved student welfare in the country.	3	3	1
To enable easy access to up to date information for effective decision making	3	2	3
To reduce the manpower capacity gap in the country	3	1	2
To enhance transparency and accountability in the management of students' information (quality, integrity of people, rules and regulations)	2	1	1
To enhance the corroborative and collaborative strategies within the government sectors to create a united forum/stand/system). E.g. link with electoral commission, in order to share information	2	1	3
To facilitate sharing of student information in the country (e.g. credit transfers)	1	1	3
To build up awareness of SIMS among different stakeholders within the education system	2	2	2
To facilitate and coordinate scholarships and bursaries offered within and outside the country	3	1	2

**Key:**

*1: Very important    2: Quite important    3: Somewhat important    4: Negligible importance.*

Tracking of student information, and facilitating its verification and certification is one of the major reasons why student information should be coordinated. This is possible if higher education institutions are comparable in terms of qualifications, as one Academic Registrar in a private university expressed during the interview (Busulwa, S. Registrar. Nkumba University. 2003. 2<sup>nd</sup>

December, Nkumba). Further more, the focus group discussions show the following views on the importance of coordination of student information:

- One will be able to track the talents of a student.
- It is easier for administrators to guide students.
- One can create a student's profile throughout his life.
- Impersonation will be reduced. There will be a basis for reference: in the case of a problem one can consult the record.
- It also helps to build a profile concerning manpower: How many graduates have been produced in what discipline, and over what period?
- It is possible to establish whether there is a need to train more people or whether enough people have been trained for a particular field in the country.
- The system will easily help to verify a student's qualifications.

Although identification, tracking, and verification of information are important reasons for coordination of student information, it is also important to note that the needs and requirements of students themselves have to be integrated into the education sector's development plans and strategies. Proper integration requires standardisation of data and activities to facilitate coordination of information, as discussed in the sections that follow.

### **7.3 Student information and activities to be standardised for proper coordination**

The study therefore intended to establish what student information and activities could be standardised in order to facilitate coordination.

#### **7.3.1 Student information to be coordinated**

By means of questionnaires and interviews, respondents were asked about what type of data they would consider important for proper coordination of student affairs. Data obtained here was coded and analysed as shown in the table below. The codes in the table have been used to show the extent of importance of the data to be coordinated. The responses of Administrative Staff (A), Interviewees (B), and Students (C) below illustrate various reasons for this.

**Table 7.2: Student Information to be Coordinated**

Type of Information	A	B	C
Educational background (institutions attended, years and awards)	1	2	2
Student's personal/bio data (name, sex, age, marital status)	1	1	2
Origin (nationality, citizenship) (village, district, country)	2	3	3
Progressive assessment and performance (reports, promotion)	2	2	2
Academic achievements and awards (qualifications obtained)	1	1	1
Behaviour/discipline information (character, personality)	2	1	3
Medical/health information (physical fitness, serious diseases)	3	2	3
Student abilities/talents (special needs/interests)	2	1	1
Previous achievements (leadership, abilities)	4	2	3
Family/parental background/status (tribe, parents)	2	3	2
Financial information (scholarships, bursaries)	3	4	3
Employment records (placement, internship, recruited)	3	4	3
Professional development	3	3	4
Address (place of residence)	3	2	4
Identification information: photographs, ID, signature, fingerprint.	2	2	3
Statistics (enrolments, transfers, performance)	3	3	2
Student's rights (legal information)	3	3	4
Co-curricular activities (sports)	2	2	3
Student administrative affairs and welfare (problems)	3	2	3
Credit transfers	3	3	3

**Key:**

*1: Very important    2: Quite important    3: Somewhat important, and 4: Negligibly important*

What emerges from the above table is that it is important to coordinate students' biographic data, abilities and talents, and academic achievements and awards. One Ministry official responsible for Joint Admissions Board (JAB) noted with surprise that some of the best students at O-level had failed to be admitted to any university (Balunywa, B. Senior Education Officer (Admission and Scholarship), Ministry of Education and Sports. 2003. Personal Interview. Kampala, 3<sup>rd</sup> September). According to the findings, the talents and interests of a student need to be traced in order to facilitate the career of a student. Furthermore, it was noted that there is a need to capture more types of student information regarding arts, sports, scholarships, and talents. Responses indicated that there is a need for creating a directory of students' talents and of those students who gained scholarships. Information about performance also needs to be coordinated. It was also clear from the research that it is important to coordinate student information such as that regarding orphan and special needs. Actually, the Deputy Director of NTC, Kaliro summarised the situation by saying that 'the normal information kept in students' personal files needs to be coordinated in the country' .

On the contrary, focus group participants were reluctant to suggest the sharing of student

information. Some comments in the focus groups show that information regarding religion and tribe should be omitted since nepotism is still a problem in Uganda.

Generally, the type of data to be captured for coordination should enable tracking of student information. This requires a suitable system that can integrate the various education strategies and reforms into the design of a student information management system.

### 7.3.2 Activities that should be harmonised in educational institutions

In order to establish which activities in educational institutions should be harmonised, questionnaires were administered and interviews conducted among the administrative staff and key informants respectively. The responses were tabulated according to the institutions that are responsible for the coordination and harmonisation of such activities, as shown in Table 7.3: The institutions considered are:

- |   |  |
|---|--|
| A: Ministry of Education and Sports                           | B: Uganda National Examination Board     |
| C: Joint Admissions Board                                     | D: National Council for Higher Education |
| E: Universities and other higher education examination boards |  |
| F: Post primary institutions                                  | G: Educational Standards Agency          |
| H: National Curriculum Development Centre                     | I: A new body or committee to be set up  |
| J: District Education office                                  | K: Other stakeholders                    |

**Table 7.3 Activities to be Standardised in Order to Ensure Coordination of Student Information**

Activities to be harmonised	A	B	C	D	E	F	G	H	I	J	K
Coordinating structure	x	+	+	+						+	
Computerisation of SIMS functions in institutions	+				x	x					
Filling in standard forms (e.g. application, registration)	X	+	+	+	x						
Use of registers and accumulated records cards in institutions	X						+			+	
Standard recording of exam results	X	+		+	+						
Standardised entry requirements	X		x	+			+				
Standardised bio data/personal information	X	+	+	+	+	+	+				
Student identification	X	+	+	+	+	+	+				+
Standardised data collection, capturing formats (e.g. use of standard codes)	x	+	+	+	+	+	+				
Training in record keeping	+		+	+	x					+	
Standardised filing/records management system	x		+	+	+	+					
Having a centralised data bank/register for students	x			+			+		x		

Ensuring provision of birth records	x	x			+	+					+
National inspection system	+			x			+				
Classification of awards and qualifications	+			x	+			+			
Endorsement and signing of documents		+		x	+	+					
Ensuring data security and controls	x	+		x	+	+					+
Marketing of services	x				+	+					

**Key:**

*X: Major coordinating function*

*+: Support function*

From the responses, it was clear that standards are required in the performance of particular functions. It is also clear that a centralised database is essential to coordination of information. The standards for procedures in capturing of data are also required. For example, one senior official from ESA suggested to the Ministry that it should design a joint form to be used to capture such student information from educational institutions. This requires a strategy to sensitise employees in the education system. It was noted that the information regarding students is in place, it only lacks a strategy to reach its users. This is why respondents advocate for a harmonised method to employ student data. The Deputy Director of Kaliro NTC suggested that all stakeholders come together and develop a harmonised way of capturing student information. Referring to student information at the NTC, he described such gaps as the following:

“Whereas employers (e.g. districts, secondary schools) employ teachers, they do not know details about such students in training institutions. Furthermore, the NTCs are not interested in obtaining information about their graduates and yet they (employers and educational institutions) all deal with the entity a ‘student’”. He felt that a forum was needed to provide feedback between the training institutions and employers (Ndiwalana 2003).

Such a forum requires standardisation of various activities, which requires an integrated approach to coordinate requirements of stakeholders.

## 7.4 Benefits of a coordinated SIMS

Respondents were required to indicate what advantage they could gain from an integrated SIMS in the country. In the questionnaire for administrative staff and student leaders, interviews with key informants and focus group discussions, the following advantages were expressed.

- A reliable and transparent civil service: There is a need for identifying and thereby facilitating the following factors: accurate, unbiased and straightforward recruitment of graduates, skills utilisation, confident personnel, uncomplicated job placement, assistance in manpower planning and providing quality employment in the country. According to the research, this will create a more productive working population. Coordination between employers and educational institutions will be possible.
- Information gap between students and administration should be bridged: Proper understanding between students and staff was felt to be necessary by many respondents. According to administrators and key informants, students will know what information is required from them when entering and while studying at educational institutions. This will help to know students' routine problems.
- Clearly, accessibility to student information would be made simpler: Respondents felt that a coordinated SIMS would ensure consistency, clearly accessibility, easy retrieval, and balanced access to information. According to respondents, errors that normally occur in the management of student information could more easily be detected.
- Duplication of data, research and activities would be avoided: It was noted that having a coordinated system would enhance verification of research inquiry and questions, and make it easier to ascertain which students have completed qualifications at which institution.
- Reduced/minimised fraud and impersonation: According to the respondents, a coordinated SIMS will minimise forgeries, and reduce impersonation.
- Duplications of enrolment will be avoided: Such a system will be able to eliminate double admissions and registrations for two or more programmes.
- Reduced data redundancy in educational institutions: According to the respondents, students' talents can be more easily identified. This will work towards meeting the needs of stakeholders that require student information in the country.
- Informed decisions about services, owing to better managed student information. According to the respondents, people will be able to learn how to manage records.



- People across institutions can share information, making networking of activities and services possible. For example, student data is useful in the census, elections, immigration, revenue collection, business, investment and employment purposes.
- SIMS will help in guiding investment in education and in human resources. It will make it possible to be able to follow the progress of a student. It is possible to identify double sponsoring. The number of students being sponsored by government, and how much the government spends on a student can be ascertained.
- Data confidentiality assured: According to respondents, it will be straightforward to ensure data confidentiality and protection of access to it.
- Effective utilisation of scarce resources. There will be reduced costs of storage and use of information
- Ensuring higher standards and a better quality of graduates.
- It is possible to transfer the credits of a student from one institution to other institutions.
- Disparities in regional and gender imbalances can be dealt with. For example, the ratio of males to females that access formal education can be established.
- Facilitating on going projects, e.g Educational Management Information System (EMIS) and Universal Primary Education (UPE).

The above responses indicate respondents' are enthusiastic about a coordinated SIMS in Uganda.

According to the Deputy Director of the Educational Standards Agency (ESA), the number of students moving through Universal Primary Education (UPE) has increased tremendously (Otyek 2003). This will mean greater numbers at higher levels of education. According to him, with a coordinated SIMS, it will be possible to link the UPE graduates with the upper levels (Otyek 2003). Although the expected benefits are numerous, one should also consider reservations regarding such a system's applicability in the Ugandan environment.

## **7.5 Reservations regarding a coordinated SIMS in Uganda**

In the questionnaires for administrative staff and interviews with the key informants, respondents were required to indicate their reservations regarding coordination of student information in the country. Their responses are indicated below.

### **a) Lack of proper security and protection of student information**

It was established through the interviews that there is a need for care with regard to the security and privacy of the system. It was noted that with such a system, it is easy to gain access to student information. For example, one student noted that some employers would not want to employ certain categories of people, based on their religion and tribe. It was also noted that such a system could be abused: people could change the data. For example, one long serving official in the teaching service remembered the case of a headmaster who swapped the cards of bright children with those of children who were his relatives. Lack of privacy and confidentiality could limit the effectiveness of a SIMS. In fact, the majority of students noted that some information is private; it should not need to be released. The responses also indicated that crucial secrets should not be made available to people they do not concern. Bureaucracy, tribalism and sectarianism characterise Ugandan cultures, and corruption may not favour the proper coordination of student information. In fact one respondent noted that the people who handle data might mishandle it. In one of the focus group discussions the warning was uttered that if the feasibility of SIMS is not well studied, it may become like UPE where ghost pupils are 'registered'. Indeed, the Deputy Director ESA asked 'who should be eligible to access the information collected? What safeguards should be developed to avoid misuse/abuse of the collected information?' (Otyek 2003).

### **b) Lack of good will, commitment, and awareness**

An integrated SIMS would require much publicity and commitment from all stakeholders. It also requires integrity of people: people being willing to give accurate information. The Deputy City Education Officer, Kampala summarises these reservations as follows: During the 1970's and 1980's, the education system would never let one repeat primary seven (see section 4.3.1) and this caused people to change their names in order to be able to repeat (Galiwango 2003 [Galiwango, Anne. Deputy City Education Officer, Kampala City Council. 2003. Personal Interview. Kampala, 17<sup>th</sup> November]). This further caused the concealment of information. According to Galiwango, people will provide information depending on what they hope to gain from such information. For example if it is stated that the entry age for primary one is 6 and parents want to enrol a child who is

5 years old, they will obtain a birth certificate showing that the child is 6 years old.

### **c) Implementation of the policy**

The majority of respondents were concerned about the implementation of the policy. It was noted that there are always difficulties in implementing new policies that delay development. It was also remarked that there is a possibility of resistance to change by the implementers of a system in which case, there is likely to be mistrust of the system. It was furthermore noted that there were likely to be over expectations among the beneficiaries which, in cases of inconvenience and delays in implementation, may cause serious misunderstanding. For example, one student noted that this may threaten the newer institutions which do not have a strong and established base regarding facilities, experience and human resources; hence they may exhibit lower standards of data management. Further observations indicated that even a coordinated SIMS might not end the cases of impersonation and forgery of documents in the country. Other concerns raised by respondents included:

- **Practicability of the idea:** respondents wondered whether it would be possible to achieve in terms of the complexity of the management of student information and of ensuring its authenticity.
- **Forgery and corruption of information:** According to the respondents, some people might provide wrong data, people may inflate or ‘doctor’ the data for their benefit, or corrupt officials may sabotage the system.
- **Failure to cope with the dynamics of modern management:** while some people may look at sharing data as an opportunity, those who have been benefiting from the system may prefer the status quo and may resist change.
- **Unemployment:** Some people may lose their jobs.
- **No common forum to coordinate:** All the organs responsible are not coordinated themselves.
- **Legal implications are not clear:** Difficulties in implementing new policies may delay developments.
- **Publicity and commitment:** There may be lack of commitment and good will among the stakeholders, that may limit the implementation of the system.

### **d) Costs involved**

The responses indicate that there are large costs involved. The majority of the respondents noted that

the exercise might be expensive in terms of money and time, regarding trained personnel, acquisition of equipment, infrastructure and transport. In fact the Deputy Director ESA noted that the system presupposes that institutions in Uganda possess computers, which is not the case (Otyek 2003). In addition, the Deputy District Education Officer (DEO), Kampala District noted that the system requires registration of students at all education levels, which require registration cards (Galiwango 2003).

However, the majority of respondents were positive about the system. Although it was acknowledged that it is expensive, it was felt to be manageable if it was explained to the beneficiaries. A clear understanding of the resources needed for an integrated SIMS in Uganda is therefore required.

### 7.5.1 Requisite resources for a SIMS

The administrative staff (A) were required to indicate the resources that they thought were necessary by various institutions in an effort to coordinate student information in the country. Key informants, through interviews (B), and students (C), through an open ended questionnaire, were required to do that as well. Instrument A listed stakeholders, for respondents to indicate the resources the institution might require, while instruments B and C had no indication of the institutions.

The number of respondents that indicated the resources already identified by the administrative staff was recorded as shown in table 7.4a.

**Table 7.4a Perception of Resources Required for a Coordinated SIMS**

Resources	RESPONSES FROM ADMINISTRATIVE STAFF (A)											SUPPORT FROM INSTRUMENT B AND C	
	Gou	MoES	Dist.	UNEB	Uni.	OT	NCHE	ESA	NCDC	BTVET	PUBLIC.	B N=47	C N=59
Top management's commitment to records management	XX	XX	X	X	X	X	X						2
A coordinating body/secretariat with a central computer centre	X	XX	X		X		X	X		X		1	4
Creating a central registry/records office/officer in charge of information	X	XX	X	X	X	X	X	X	X			2	2
Financing the budget for a SIMS	XX	X	X	X	X	X	X	X	X	X	X	8	10
Provision of infrastructure (e.g. Computer laboratories, media libraries)*	X	X		X	XX		X	X	X	X		3	5
Human resource management for records and institutions	X	XX	X	XX	X	X	X	X	X	X		7	14
Computer systems (network equipments, Internet)	X	X	X	X	XX	XX	X	X	X	X	X	15	21

\* Computer laboratories and Media libraries: facilitates for backing up data on storage media such as CD-ROMs.

Capturing and storing materials and resources	x	xx	x	x	xx	xx	x	x	x	x		5	2
Putting in place a clear policy on information, and rules and regulations	xx	xx	xx			x	x		x		x	2	4
Establishing a databank/database	x	xx	x		xx	xx	x			x		4	2
Management structure for coordinating student information in the country	x	xx	x				x	x			x	3	1
Identification cards/facilities (photos)	x	xx	x		x	x	x	x				1	
Standardised filing system/cards		xx	x	x	x	x	x	x	x	x	x	2	
Regular inspection of educational institutions		x					xx	xx					
Student information committees at various levels	x	xx	x							x		1	4
Communication services (reports and correspondence, meetings, notice boards, suggestion box)	x		x		x		xx	xx	x	x	x		19
Advocacy for the system	x	x	x				x						
Training and sensitisation of stakeholders, career guidance and counselling	x	xx	x	x	x	x				x	x	8	6
Decentralising data at various levels			xx						x		x	1	
Security facilities					xx						x		
Public relations office/facilities		x			x	x						1	3
Honest and integrity	xx	x	x	x	x	x	xx	xx	x	x	x	1	2

**Key:**

*XX:* Major requirement

*X* Support requirement

*Blank box:* Negligible

*GoU:* Government of Uganda

*Dist:* District

*Uni:* Universities

*OT:* Other Tertiary Institutions

*MoES:* Ministry of Education and Sports

*UNEB:* Uganda National Examination Board

*NCHE:* National Council for Higher Education

*ESA:* Education Standards Agency

*NCDC:* National Curriculum Development Center

*Public:* The General Public

*BTJET:* Business, Technical and Vocational Education Training

Responses demonstrate that a coordinated SIMS requires the setting up of a central liaison body and offices for the SIMS, a standard filing system, a clear policy and training and sensitisation of the beneficiaries.

Interview responses indicated a need to ensure that all institutions have Internet facilities, hardware and software as well as trained IT personnel. The Deputy City Education Officer in Kampala noted needs for finance, for training of staff in to computerise records, and techniques of record keeping, and for training district officials and institutions on how to implement the policy. It was observed that existing communication channels, like basic correspondence and meetings in various institutions, can be utilised to educate the beneficiaries. While commenting on basic problems in training and sensitisation, the Deputy Director of the National Teachers' College (NTC), Kaliro noted the current trend where people want to be paid to attend meetings. He noted that, currently, many people attach importance to whether they are paid to attend meetings. It was pointed out that it

is important to coordinate meetings to sensitise the lower cadres in the country. It was observed that quite often when people attend meetings, they do not transfer the knowledge downwards, which is why it was suggested that lower cadres be used. They are the implementers, manage the student information, and are knowledgeable about the needs for a system in that particular environment.

Students emphasised that a body responsible for coordination should be put in place and equipped with the necessary facilities to enhance access. It was noted that a good student information centre, that provides free interaction among the institutions, is required. This is why a cost-effective strategy for coordinating student information in Uganda is consequently needed.

### 7.5.2 Cost-effective method of coordinating student information

Many resources are required to coordinate student information in Uganda. The respondents were therefore required to indicate the most cost-effective way of coordinating student information. Table 7.4b below shows the observations stemming from the three instruments A, B, and C.

**Table 7.4b Responses Regarding Cost Effective way of Coordinating Student Information**

<b>Cost-effective methods of coordination Details</b>	<b>A</b>	<b>B</b>	<b>C</b>
Computerising records	1	2	2
Building a central students registry	1	3	4
Installing and connecting offices/networks, internet and intranet services or posting students' information on the website.	2	2	1
Creating a central body with a centralised database in one centre where one concerned has access.	2	2	2
Forming a consortium of integrated activities and functions. This involves meeting with students regarding their requests	2	3	2
Integration of a budget for information management into organisational plans including donations to institutions, instituting a subscription fee and budgeting for SIMS activities.	3	3	3
Facilitating the use of existing student's organisations/forums to coordinate student information (have a student information secretariat)	1	1	1
Establishing information centres (kiosks) with relevant devices	3	3	3
Developing a backup/disk library	3	3	4
Utilising and improving on existing channels (e.g. a newsletter, notice boards, suggestion boxes and announcements)	2	4	1
Proper records keeping (collection, processing, storage). Ensuring good storage facilities, standardisation of records.	1	1	2
Sensitisation and training of staff in information management skills. Sensitise student leaders, seminars for students, guidance and counselling.	1	1	1
Setting guidelines regarding SIMS, which embrace all students regardless of the level of education.	3	3	4
Setting up regional offices of student information at districts and below for purposes of coordination.	3	4	3

Employing persons who are responsible for records in schools and educational institutions. Employing information offers at various levels	3	2	2
Standardised forms to capture information (use similar codes)	2	2	4
Integrate SIMS into the existing education sector programmes and strategies like EMIS and UPE.	3	3	4
Form information committees at different levels, including education officers, students, head teachers, teachers and parents receive information.	3	3	4
Building confidence, transparency, politeness and ability among information providers	4	3	3
Piloting the study	4	3	3
Conducting research and follow up.	4	4	2

**Key:**

*1: Highly regarded            2: Moderately regarded            3: Least regarded            4: Negligible*

Findings indicate that utilisation of existing communication structures, proper keeping of records in the entire system of education and ensuring a well informed population is a cost effective way to ensure better coordination of student information. A strategy is therefore called for to keep track of student information between and within institutions.

**7.6 Factors to facilitate tracking of student information**

One of the objectives of this study was to establish the factors that may help to keep track of student information. The administrators were required to indicate what could be done in this regard. Responses indicated that to keep track of student information, a system to identify a student’s profile is required. This is possible if there is a coordinated structure and standardised guidelines for data formats and procedures in the management of student information. In questionnaires to administrators and students, interviews with key informants and focus groups, the following factors that may facilitate coordination of student information were observed.

**a) A coordinating system**

A central secretariat, with coordinating centre (agency) within the MoES, needs to be established to coordinate student information in the country. It should have a centralised common database with decentralised data entry services. It should provide an administrative structure with ability to capture data from districts. The common database should be updated and constantly checked and hard-copies be properly stored. According to interviewees, a centralised computerised system, located at head quarters of the MoES where all the information about a student can be obtained, was recommended:

Findings indicate that there is a need for a centralised data bank system, having registers at different levels of education (schools, sub country, districts and to set up archives to be accessed at a later time). For example, if somebody dies, the system should contain all the records of such a person.

Responses from the focus group discussion comprising academic staff who head departments in an Primary Teachers College showed the necessity for a coordinating unit to bring together information requiring that many people would need to be computer literate to access it.

#### **b) A student identification system**

The respondents indicated that there should be an identification number for students. It was considered that allocating a student number that is permanent, updated automatically, and linked with the date of birth would facilitate coordination of student information in Uganda. Discussing the identification of students, interviewees mentioned that a standard form at school would be required to capture data about a child provided by the child or parent. Furthermore, respondents suggested an identification system that validates student records. For example, one interviewee from UNEB noted that, if there were a national identification number, one could start with that, so that the Government could utilise such a number for SIMS purposes. It was further observed that an identification number would be able to facilitate the tracking of student information in the following ways:

- If one possesses records of those who are already registered, such a person can be traced.
- When students leave school they can still use the same number for purposes of employment, business, or other community services. All the records concerning the person can now be linked to that number.

The infrastructure already in place can be used to maintain and keep track of records. For example, the majority of respondents recommends a system to identify a student, which keeps track of those who have dropped out. According to responses, the government should register the number so that a student cannot be given another number. Furthermore, responses showed that a system using such a number, to enable information to be kept in the district, is required. In fact, if every district had a carefully developed database regarding student information, and there was a national information system, it would be very easy to keep track of student information (Ndiwalana 2003). An official from Uganda National Students Association (UNSA), for example, observed, if a student is



transferred, there should be a recommendation from the headteacher and also the co-ordinator to communicate where the student is going. This requires a central place such as the MoES where information is available about where a student has moved to.

According to responses to a questionnaire administered to students, an integrated system to meet their needs is important. A need for recording information right from the birth of a child and tracking his education throughout was also expressed. An information agency should be established to oversee and keep track of student information. This agency should have branches at district levels and should capture birth and death registration information. This, however, requires a strategy for the sustainability of such a system in the country. The necessary factors identified from the responses include:

- **Putting reliable management structures in place**
- Recruiting or deploying a designated officer responsible for student information at schools/institutions, and at sub county, district and national level.
- Establishing information committees in institutions according to the existing education or related decentralised services.
- Linking institutions to a common forum with schools, employers and government bodies.
- Forming networks for resource sharing. For example, linking institutions with accredited institutions, associated exam authorities, associations, JAB, and NCDC. Registrars to form a forum for discussing issues regarding student information.
- Launching joint publications and holding regular meetings to promote and publicise SIMS functions.
- Diversifying sources of information and developing relationships with the employment sector.
  
- **Infrastructure and financial support:**
- There is a need for establishing information centres accessible by the public, Internet cafes at respective institutions and for the development of Internet in schools.
- Institutions are also required to set up networks, Internet, and Website and computerise the students' records.
- The majority of respondents suggested instituting a charge (like a convocation fee). The exercise needs funding to begin with.

- **Education and Training:**

- A curriculum review to introduce courses in records management to various educational institutions, which would facilitate the proper keeping of student information.
- Training, sensitisation of stakeholders and career guidance are important in facilitating information management in educational institutions. This will ensure well-trained information workers who are motivated.
- Encouraging stakeholders to keep information and to appreciate the need for a SIMS. For example, training head teachers in this regard will facilitate the keeping of records in schools.
- The information available should be publicised. For example the focus group with student leaders of Makerere University expressed the idea that it would be necessary for users to have knowledge of information systems, communication skills, negotiating skills, technical skills, coordinating skills, interaction skills, consulting skills and lobbying skills.

- **Political involvement and good will:**

Involvement of students, competent leaders, administrative dedication, good administration free of corruption. Keep in touch with places of origin. Support from administrators, political will.

**Legal and policy issues:** There is a need for a policy or a law enforcing keeping of records. Making applicable laws or regulations on information access and flow requires informed, competent, involved, disciplined and committed stakeholders. Hence a strategy on how a student identification system can facilitate effective use of student information is required.

## **7.7 Student Identification System**

All the respondents were asked to indicate whether putting in place a National Student Identification System (NSIS) could facilitate tracking of student information. The following table shows the responses from administrative staff (A), interviewees (B), and students (C). Respondents were required to answer either Yes or No. The F in Table 7.5 represents percentage frequency.

**Table 7.5 Observations on an Identification System**

Observations	A	F	B	F	C	F	Total	F
N=	60	100%	47	100%	59	100%	166	100%
Yes	47	78%	45	96%	54	92%	146	88%
No	13	22%	2	4%	5	8%	20	12%

From the table, it is clear that the majority of respondents (88%) agree that a national student identification system can facilitate keeping track of students' information. However, certain significant responses (12%) suggest another means of identification of students that would facilitate this activity. A number of respondents gave various comments on why a national identification system may facilitate tracking of student information.

- **To avoid forgery by students:** It was observed that a national student identification system (NSIS) would reduce forgeries of academic documents. Responses indicated that the use of a NSIS would enable transparency in the education system, which is a foundation for proper accountability regarding students' information in the country
- **Easy access to information:** A NSIS makes it simpler to access and verify information in a short time. It was noted that the current trend in the modern world requires making activities easy.
- **Uniqueness:** The NSIS is able to provide a unique number for every student. With such a number, it will be simple to know the student's background and performance. According to the research, such a number can be used when entering educational institutions. It was also noted that such a number could reflect citizenship and place of origin of a student.

Although the majority of the focus groups agreed with the idea of having a national student identification system, some observations show that the use of an identification system may not totally curb forgeries. For example, if someone dies, somebody else can still use that number. In fact, some of the responses show that it is not possible to uncover somebody who does not own the information to be identified. Actually, some respondents who did not wholly support the use of an identification system were asked to indicate other ways by which student information can be coordinated in Uganda. Many of the suggestions supplement the concept of effective functioning of a student identification system to enhance coordination. These suggestions include:

- **Decentralised coordination:** The use of an identification system should work within a national coordination strategy that would be coordinated on a regional basis.
- **Use of photographs:** Some of the respondents suggested the use of photographs on certificates to help in coordination of student information. According to one administrative staff, there should be a way to prove that index number xxx belongs to the person who claims it. In fact, a focus group discussion with academic staff of Shimoni Teacher Training College (TTC) supported use of photographs along side a NSIS. According to this group, attaching a photograph to each academic certificate would help in keeping records authentic and facilitate easy identification of student information.

### 7.7.1 A Student identification number

It was noted from Research that a student numbering system should be in place and that it should be nationally adopted. Such numbering was associated with a number like a PIN number that is used to identify a student. Such numbering should be based on the UNEB registration system and birth and death registration guidelines as well as institutional codes based on districts and types of institutions, are important. It was noted that the existing codes of the district, county, sub-county, and institutions used in various functions in the country can be used. However, it was also noted that parents and teachers should assist in the identification of a student/pupil. Below are some of the suggestions offered to strengthen the registration systems:

- The current registration system at institutional level should be used to issue a number. According to the findings, registration should be done in conjunction with the local councils (LC) system. Using this system, parents should be involved in endorsing the forms, one interviewee noted.
- Putting in place a data collection form, also to be used as a monitoring tool. One interviewee noted that filling in of forms requires technical staff. Views of respondents show that by use of district based codes, system designers should be able to design the identification number of each student.
- Maintaining a register of students at all institutions at all levels. For example, a teacher needs to maintain a register in class and the school should always maintain a register of all students [pupils] in the school.

By means of questionnaires to administrative staff (A) and students (C), and interviews with key informants (B), the respondents were requested to indicate at what level of education the

identification number should start. Table 7.6 below shows responses here.

**Table 7. 6 Observations on the Levels of Education at which Identification Numbers should start**

Level	A	F	B	F	C	F	Total	F
N=	60		47		59		166	
Birth. Should be a national number	0	0%	3	6%	3	5%	6	4%
Primary level (P1)	35	58%	23	49%	28	47%	86	52%
Primary seven (P7). When a child is registering for exams at P7	1	2%	2	4%	1	2%	4	2%
Secondary School (O-Level). When a child is joining S1	13	22%	12	26%	14	24%	39	23%
Secondary School (A-level) or equivalent. A continuation of O-level number by appending extra information	4	7%	3	6%	3	5%	10	6%
Higher Education	3	5%	2	4%	6	10%	11	7%
Never indicated	4	7%	2	4%	4	7%	10	6%
Total	60	100%	47	100%	59	100%	166	100%

**Key:**

*F:* percentage frequency

*N=* number of respondents

*P1:* Primary one

*P7:* Primary seven

*S1:* Senior one

Responses from most of the focus group discussions agreed that primary school level is a starting point for citizens of Uganda when joining the school system. Observations in the focus group also show the following:

- One centre in the education system should be responsible. In a district it should be the responsibility of the District Education officer (DEO).
- It was noted that at the national level, UNEB, MoES and NCHE should be involved while the Local Council (LC) system should be involved up to the district level.
- It was noted that the number should be issued by administrators of institutions following guidelines given by the MoES.

**7.7.2 Data about student information that make up an identification number**

Questionnaires, and interview respondents were asked to indicate what data could be used to make up an identification number. For all responses, observations were tallied according to the type of data mentioned by each respondent for each category (administrative staff (A), interviewees (B) and students (C)). The percentages were computed for each category based on each data type and also for the totals. The results appear in Table 7.7.

**Table 7.7 Observations on the Data Making up an Identification System**

Data type	A	F	B	F	C	F	Total	F
N=	60	100%	47	100%	59	100%	166	100%
Educational institutional background (previous schools)	16	27%	4	9%	3	5%	23	14%
Names (with Initials)	17	28%	12	26%	30	51%	59	36%
Gender	11	18%	5	11%	7	12%	23	14%
Marital status	3	5%	1	2%	3	5%	7	4%
Religion	2	3%	1	2%	3	5%	6	4%
Place of origin (home, district, sub country, village)	16	27%	6	13%	8	14%	30	18%
Contact address	2	3%	20	43%	7	12%	29	17%
Ethnic/tribe/language		0%	3	6%	3	5%	6	4%
Place of birth (village, district, hospital)	8	13%	6	13%	3	5%	17	10%
Date of birth	27	45%	14	30%	26	44%	67	40%
Nationality or citizenship	2	3%		0%	6	10%	8	5%
Family/parental information	11	18%	3	6%	3	5%	17	10%
Next of kin/sponsor	1	2%		0%	2	3%	3	2%
Particulars of registration (institution, dates, choices, location—districts, dates)	56	93%	26	55%	37	63%	119	72%
Academic attainments and performance (certificate of due performance)	14	23%	4	9%	14	24%	32	19%
Identification features (photos, stamps, signature (authenticity), blood group. Index number/registration number, serial no.). ID card to be issued.	17	28%	24	51%	22	37%	63	38%
Behaviour/discipline records	1	2%	1	2%	4	7%	6	4%
Health Status	1	2%		0%	2	3%	3	2%
Physical conditions, handicaps, special identification features, height	3	5%	1	2%		0%	4	2%
Abilities, interests, talents, physical co-curricular activities, previous certificates of merit, achievements, (responsibilities held)	7	12%	1	2%	3	5%	11	7%
Professional and employment record (profession of a student)	6	10%	2	4%	7	12%	15	9%

**Key:** A: Questionnaire for Administrative staff      B: Interviews with Key informants  
C: Questionnaire for Students                              F: Percentage frequency

Findings indicate that particulars of student information regarding registration (72%) are important to identify a student: the administrative staff strongly supported this view (93%). Date of birth (40%) is generally accepted by many respondents, such as administrators (45%), interviewees (30%), and students (44%). Although the ‘name’ was not favoured by the majority of respondents, just over half of the student leadership (51%) prefer it as an element in defining an identification number. From the study, it is clear that certain information such as health status, physical conditions and handicaps, and next of kin information (all 2%) does not play a significant role in defining an identification number. A few of the respondents noted that, at the moment, the issue of the data to identify a student is not a priority; what matters are requirements and conditions for such a system to identify a student.

### 7.7.3 Requirements for instituting an identification System

Respondents were asked to indicate what is needed to be in place in order to adopt and implement an identification system. Responses, which seem to be related, are explained below:

- **Assessment of the information needs:** It was clear that there is a need to research the needs of users throughout the country. There was also a need for conducting study visits in other countries, sensitisation on policy matters, and awareness among the stakeholders. Interviews showed that a lot of work needs to be done in the interests of the stakeholders. It was also clear that there is a need to articulate the benefits of a well coordinated system to the beneficiaries. The Ministry should liaise with the National Bureau of Statistics and the Electoral Commission to identify which information is important. Districts and local government should be involved in identification of such needs.
- **Utilisation of the existing strategies:** Respondents considered the utilisation of the existing Government programmes like UPE, and decentralisation, as important. According to interviewees, local government procedures must function if an identification system is to succeed.
- **A new policy:** It was established that the Ministry of Education and Sports should issue a new policy regarding an identification system. Planning should be done. The MoES should put in place guidelines and/or procedures to ensure proper verification by various authorities. The policy should also provide guidelines on the coding system. For example, it should be a policy that the student's name remains fixed, one interviewee noted.
- **A central coordinating body should be put in place:** According to the administrative staff, a centre should be established to coordinate with local councils and decentralised programmes and services in the country. There is also a need for the Ministry to establish an office/department which is responsible for student information, one official observes. According to respondents, the department will develop and generate data about students in the country, as will be discussed in Section 7.6.4.
- **Verification of information:** A student identification system requires an effective method of verification of information. According to the study, verification requires clearance in institutions and place of origin. Further more, many views recognised the role of local councils (LC) the area in verifying the history of the student in the local area. Accordingly, responses suggest for a committee

to be set up at school/education institutions level, sub-county level and district level under the DEO office to coordinate issues regarding identification of student information.

Views were obtained from administrative staff (A) and interviewees (B) as to what they would consider to be the necessary conditions to be fulfilled before an ID number is issued. The Table 7.8 below shows the various conditions identified.

**Table 7.8 Observations on Conditions for Receiving an Identification Number**

<b>Conditions</b>	<b>A</b>	<b>B</b>
Be a citizen of Uganda or a non citizen should be identified by their nationality.	7	2
Fully registered for a particular level in the institution with proper documents (must be a student in the institution)	20	11
Payment of an acceptable ID fee to an institution	3	3
Institution should be government-registered/recognised.	3	1
Every school attended reflected at registration.	2	1
Confirmation and clearance by relevant authorities (LCs, administration), verification documents available. Forms for registration be endorsed. Parents' confirmation and verification.	8	8
Supporting birth and health records (birth certificates, immunisation cards). Affidavits where necessary should be provided.	5	3
Filling in forms (information captured) at all levels. Full details of attendance in previous years. Identity number quoted at every entry.	1	4
Registers maintained at school, districts and national level. Proper filing system/records maintained.	3	
Criteria for allocating the number defined and adhered to.		2
Confidentiality should be assured.	1	
Not a lot of bureaucracy involved. Easy to obtain as long as you are registered.		2
No specific conditions are required.	1	

It is clear from the respondents that birth registration is an important requirement when entering institutions at every level. Outside the education sector, birth certificates are also required on a number of occasions, for example, during a marriage ceremony, when seeking employment, and when obtaining a national passport. Like the birth certificate or the baptism certificate, the number on the identification system needs to be quoted at every entrance point in education system. According to respondents, it was suggested that the moment the child is given a number, it needs to be utilised throughout his/her education. It was noted that the services of Education Standards Agency (ESA) may be utilised to ensure standards. For the proper functioning of an identification system, a reliable coordinating structure is necessary, as will be discussed in the sections that follow.



#### 7.7.4 The coordinating structure for SIMS

According to the respondents, there should be in place a coordinating structure in the MoES that would liaise with examining bodies (e.g. UNEB) and birth registration centres to effect the objectives of an identification system.

##### 7.7.4.1 Purpose of SIMS coordinating structure

Administrative staff were required to give the purpose for which a SIMS coordinating structure would serve, as explained below.

- **Easy access to student information:** According to responses, the SIMS structure should provide valid information, ensure improved accessibility to it and the security of such information. It should also reduce wastage of resources.
- **Proper keeping of records in education institutions:** It was suggested that a SIMS structure would ensure proper records and databases regarding student information in the country. Such a system should bring information together, reduce forgeries, and minimise duplication of resources. It is its aim also to ensure the consistency of records for each student in the education system.
- **Facilitate and improve planning:** The purpose of a SIMS structure is to improve the student information management in the education system. This will facilitate better service delivery in planning and resource allocation at both national and lower levels of governance.
- **Availability of student information:** According to the responses, the SIMS structure should ensure transparency and accountability, to guarantee proper identification of student information. The structure should also ensure coordination of student information in different educational institutions.

##### 7.7.4.2 Functions of a SIMS coordinating structure

To achieve such aims, the respondents suggested the following functions of a coordinating SIMS structure:

- Assessing student information needs in the country.
- Recording information about a student and allocating numbers to students.
- The system should also be able to identify, capture, store, and verify student information.
- Storing and quick retrieval of desired student information should be possible.
- It should also be able to assess and ensure security for such information.

- Maintain and update student information in institutions of higher learning.

The system should provide appropriate strategies for procurement of facilities requiring training of personnel and, setting up policies for the access to, capturing and using of student information. This necessitates a national coordinating unit to coordinate all the above functions.

**a) A national coordinating unit:** It was observed that there is a need for a one stop centre where student information can be verified and accessed. The majority of the respondents suggest that an office or unit in the MoES should coordinate student information from all institutions. It was also suggested that the MoES should establish a committee to oversee and coordinate the performance of SIMS in the country. According to the research, the national, central unit in the Ministry, district units, and public information access units are necessary to enable access to student information. It should be the duty of the coordinating units to ensure computer literacy among the stakeholders, an effective computer network environment and proper coordination of information between MoES with all other units that require information. It should be the duty of such units to integrate all the sectors ranging from schools and districts to the government and political units in the country that use student information. Links with other systems, in places like schools, health services and the existing decentralised system of governance, are a requirement for an effective SIMS.

At each information unit, records and archives management services should be furnished. There is a need for office space, computers and other facilities to enable proper coordination of student information. However, the sustainability of the system requires proper involvement of all stakeholders. Government involvement would consist of legislating for such a structure and continuous support.

**b) Decentralised coordinated information systems:** Respondents show that information capture, access and use should be decentralised. The findings also suggest that there should be a node in each institution/school, university, district, and at national level. It was also clear that each institution should have a system to capture, store, and facilitate access to student information. Such a system requires proper keeping of student records at all levels. Such established systems should be manageable and easily accessible with the following characteristics:

- The schools systems should coordinate at the sub-county, county or district levels.

- The system should allow collection of information, store it, and if possible publish it (i.e. make it accessible). Existing structures, like UNEB, to collect and receive this data from schools may be utilised.
- Access points should be easily accessible to beneficiaries so that one can find relevant information.
- A Webpage and decentralised Internet services at every level are necessary.
- The coordinating unit at the MoES (to oversee other systems) would be linked with the population office census and manpower planning to ensure SIMS integration in the national development programmes.

**c) Administrative structure:** According to the respondents, it is important to establish and fill positions responsible for management of student information. It is necessary to recruit staff such as database managers, co-ordinators and data entering clerks. Competent management and manpower planning at all levels are required for the successful management of a SIMS. Required also are well-trained information workers at various levels in the country.

**d) Institutional linkages and networks:** Respondents indicated a need to create forums for coordination of student information. It was clear from the study that it is important to encourage school councils, and inter school or inter college workshops, seminars, symposiums, and publications in an effort to coordinate such information. It was felt essential to put in place exchange visits among administrators and student leaders, for them to learn from other systems.

The findings suggested that a wide area network connecting institutional units to national, district and inter institutional units should be put in place. This requires use of the Internet. It was also clear that Internet based databases for MoES and NCHE are necessary. Implied is that each institutional information unit should be linked with others to ensure coordination of student information in Uganda. This is why expected indicators are necessary for effective implementation of a SIMS.

## **7.8 Expected indicators of an integrated SIMS for Uganda**

All respondents were requested to indicate what they would expect to see as an indication of an integrated SIMS. As this was an open question, respondents gave as many responses as they could. For all responses, observations were tallied according to the expected output of an integrated system which was mentioned by each respondent for each category (administrative staff (A), interviewees (B) and students (C)). The percentages were computed for each category based on each identified expectation for each category and also for the totals of each particular expectation. Table 7.9 below

shows the responses obtained from the respondents. F in the table refers to percentage frequency.

**Table 7.9 Observations on the indicators Expected of an Integrated SIMS**

<b>Expected output of an integrated SIMS</b>	<b>A</b>	<b>F</b>	<b>B</b>	<b>F</b>	<b>C</b>	<b>F</b>	<b>Total</b>	<b>F</b>
N=	60	100%	47	100%	59	100%	166	100%
Student information identification system functionally working	11	18%	8	17%	4	7%	23	14%
Standardised data collection forms used	1	2%	4	9%	4	7%	9	5%
Coordination of students' information and activities possible	7	12%	10	21%	11	19%	28	17%
A system to verify student information in place	4	7%	6	13%	4	7%	14	8%
Tracking of student information possible	4	7%	1	2%		0%	5	3%
SIMS integrated within education sector programmes and reforms	5	8%	7	15%	10	17%	22	13%
Security and protection procedures for student information in place adhered to	2	3%	2	4%	3	5%	7	4%
Statistics on students easily made available	2	3%	3	6%		0%	5	3%
Access strategies and access points to students' information in place	12	20%	12	26%	16	27%	40	24%

Access to student information is the main expectation which respondents have of an integrated SIMS. Many respondents (24%) indicated that the ability to access information would point to an effectively integrated SIMS. The presence of an identification system (14% of respondents overall), was favoured by the administrative staff (18%), and interviewees (17%) but by only 7% of students. Explanations of the indicators are detailed in appendix 7.1.

Findings suggest that there is a need for national operational machinery to be set in place. This requires a headquarters for coordinating the system. For example, views in the focus group discussions propose a place in Uganda where one can find the kind of information he wants about a student. The following are some of the observations from the interviews that describe the factors indicating an effective SIMS.

- Such a system should be able to answer the questions regarding what data is kept, how it is kept, where it is kept (e.g. the district), and how to access that data.
- It should be able to satisfy the needs of authorised people to obtain student information.
- The system should ensure availability, wide sharing, timeliness and accuracy of information.
- Such a system should have the ability to track students, to ascertain how many have succeeded, where they are, what they are doing, and also those who have failed.
- The system should be workable and should not require much red tape.
- It should ensure that the retrieval of student information is made easy.

- Such a system should reduce the rate of impersonation in the country.

For such a system to be effective, a strategy is required for its integration to the socio-economic development programmes of all sectors.

## **7.9 Sustainability of an integrated SIMS in Uganda**

All respondents were asked to comment on a strategy to ensure the sustainable and successful integration of a SIMS into the socio-economic environment in Uganda. The following are the comments made by the respondents to the questionnaires, interviews and focus group respondents in this respect.

### **7.9.1 Education and training**

From the research conducted, it was clear that training of staff and trainers, sensitising stakeholders, and curriculum developments are crucial in sustaining an integrated SIMS in a country. Results obtained from administrative staff, students, key informants and focus groups show the following views on education and training.

#### **a) Counselling and participation**

It was felt that counselling stakeholders to give relevant data is important. For example, majority of respondents suggested a capacity building programme to develop experience in their leadership to ensure the implementation of a SIMS. According to study findings, this would teach behaviour strategies and an ability to withstand challenges, to enable stakeholders to develop leadership abilities. According to the responses obtained, counselling among the stakeholders would ensure that:

- ◆ all those involved (including teachers, students, and administrators) will have a common stand/vision;
- ◆ there are committed people who drive the system;
- ◆ districts start short courses and train guidance counsellors as well as train teachers about counselling to improve dissemination of information regarding students to institutions.

#### **b) Training of staff in information management skills**

Respondents suggested that all staff should be trained in data and information management skills. It

was also clear that people who manage student information need to be trained in records handling, management and filing, and verification skills. It was felt by participants that institutions need committees to handle and coordinate training of staff in SIMS. Some of the respondents were of the view that there should be training schools responsible for teaching records management to people handling student information. The majority of the respondents felt that, although the SIMS idea sounded good, without training, it would not take off. This was reiterated by majority of interviewees who suggested that, the MoES should be involved in training of personnel in management systems to develop manpower. In fact, the Deputy Director ESA had his to say:

*You see at the moment we are getting consultants. Everywhere consultants! Consultants! These things we could do if we had a national institution to train these people (Otyek 2003).*

Also, the majority of administrative staff suggested a review of curricula at various levels of education, e.g. certificates, diplomas and degrees to integrate records and information keeping skills. According to the research, such skills should ensure up to date information literacy skills, keeping and managing student data for performance improvement. It was also felt necessary to educate and train all able Ugandans through universal educational programmes. In fact, the majority of ministry and district education officials suggested that information and records management skills be introduced in primary teachers colleges and national teachers colleges to produce teachers who are information literate. According to respondents, these are the people who become administrators in respective schools and colleges and who handle students' records.

According to the study, there is a need for workshops on keeping of records, while refresher courses on handling student information are also required. In fact, the majority of administrative staff suggest for training of trainers for personnel in the whole education sector to train in keeping of records. It was also established that utilising the existing structures and employing the required staff would assist in implementing the system. This clearly requires a high level of consultation with stakeholders at all levels.

### **c) Sensitisation of stakeholders:**

All respondents called for workshops to be offered to various stakeholders, including politicians, and for educating the masses regarding the importance of student identification. Respondents also suggested organising public lectures and meetings to share problems in providing student

information. According to the findings, sensitisation should be perceived as a day-to-day life routine and should involve reaching the grassroots, for example at schools, and contacting all stakeholders that provide or use student information.

The awareness derived from this sensitisation should articulate the benefit of a consistent plan being developed so as to equip the people who are going to be involved. Sensitisation allows people to perceive, own and value the importance of capacity building. Records management in educational institutions from primary to tertiary level should be encouraged. Fostering the awareness of the stakeholders in schools is crucial. Sensitisation of the local councils regarding the providing of information to schools/authorities seems to be important.

People need to be made aware and persuaded that this is a good thing. The majority of administrative staff suggested the sensitisation of politicians—members of parliament who represent people - regarding the system. On the other hand, interviewees expressed the necessity for sensitising politicians to gain their support for purchasing the hardware and software that may be required for implementing the system. According to students, information-handling skills are necessary for them to acquire. Findings also suggested that people who work where information is kept should be trained to use facilities to the optimum level of accuracy. Furthermore, the Government should also be made aware that it is a sign of backwardness not to maintain well kept information that is easy to access.

**d) Publicity and communications:**

It was felt necessary to publicise information using various media, including institutional bulletins and mass media. The majority of respondents suggested a common Website accessed by students to enable them to gain exposure to the outside environment. Students suggested dramatising the need for an identification system by presenting a play showing the need for coordination of student information in Uganda.

**e) Performance improvement and evaluation:**

Responses suggested that there should be continuous research to discover the social constraints regarding the feasibility of a SIMS. It became clear that the involvement of stakeholders, monitoring and evaluation of performance is fundamental in the sustainability of a SIMS. The majority of respondents emphasised the need for computer knowledge in an effort to benefit from the use of a

SIMS. It was also suggested that, for such an idea to meet its objectives, it is important to start it on a small scale and see the benefit of that particular project. One district inspector of schools noted that the ministry should engage districts so as to publicise the idea of a SIMS. The majority of respondents believe that a SIMS is one of the most effective strategies to improve the current system in use. Its efficiency should be observed, and strict and effective monitoring carried out.

### **7.9.2 Funding**

According to the findings, provision of information facilities, funding and support, resource mobilisation, and instituting a contribution fee paid by institutions could constitute the main funding strategies for an integrated SIMS, as explained below.

**a) Provision of information facilities:** For successful implementation of a SIMS, respondents indicate that it is important to provide sufficient funding for various kinds of automated system and materials, e.g. electronic files. Interviewees suggested setting up a system at all the levels of education to ensure mobilisation of funds for provision of computers, telephones and other electronic data tools.

**b) Funding and support:** It was suggested that the Government and educational institutions should allocate funds for the implementation of a SIMS. It was noted that, initially, the government should provide funding for this venture. It was further suggested that the Ministry should incorporate a budget in its strategic plan. It was remarked that the government could assist through those ministries that share the SIMS. It was felt, however, that donor funding is required. In any case, all educational institutions should budget for a SIMS in their respective strategic programmes.

**c) Resource mobilisation:** The majority of respondents suggest that stakeholders need to be mobilised (government, donors, institutions, parents and guardians) to ensure cooperation, good working conditions and goodwill. According to respondents, the involvement of donors to back up such efforts is crucial. The Majority of interviewees commented that a SIMS might be expensive at the start but once it is established, the costs might reduce considerably. It was pointed out that it is possible to utilise part of the education tax levied by local governments to improve records management in schools. However, one education officer from a district noted that there is always an assumption that districts have money. Some of the district officials suggested therefore that there is a need for a national budget and budgetary allocations to districts for implementation of programmes



at that level.

**d) Institution of a subscription fee:** The majority of respondents perceived a need to institute a subscription fee paid by participating institutions. However, the Ministry needs to be involved in administering this. According to the responses, an annual fee should be paid by all institutions. The Executive Director of NCHE had this to say: ‘If the government funded this project and I had the staff, the money to pay, I would be able to do most of the work. We have many capable people but the amount of money given is little. I can only do a few things. Some one has to pay for it. E.g. you could sell the identity card’ (Kasozi, A. B. K. Executive Director, National Council for Higher Education. 2003. Personal Interview. Kampala, 7<sup>th</sup> October) A few students suggested that an annual subscription fee by every student should be collected by the administration of the institution. The example of the Uganda National Students Association (UNSA) fee was used to show how such a cost could be recovered. For higher education, it was felt that such a fee could be integrated into registration fees already paid by students in their respective institutions.

### 7.9.3 Management structure

Responses in questionnaires, interviews and focus groups show that establishment of committees, a reliable management structures and high-level government intervention, ownership of the system and performance improvement are some of the strategies to enable the sustainability of an integrated SIMS, as explained below:

**a) Establish committees for SIMS:** It was considered that it is a necessity for each institution to put in place an implementation committee. Setting up working committees at all levels is crucial for the sustainability of the system. For example, it was suggested that each university should have a records management committee for coordination and supervision purposes. It was also suggested that from time to time, advisory committees should be established, from the grass roots (Local Council One (LCI) to MoES). Accordingly, each institution should have a local committee. There should also be an advisory body at the national level, responses indicated. However, it was also suggested that initially, an interim committee to educate stakeholders and establish the project should be put in place by the MoES.

**b) Establish management structures:** Utilising existing management structures in education systems are likely to facilitate effective sustainability of an integrated SIMS. It was, however, felt

necessary that responsible officers should be deployed to coordinate the system in various institutions. Responses also show that the management bodies (governing councils) should exhibit a high sense of commitment in doing their work. The creation of a joint information centre is necessary. Every institution of higher learning should be connected to this centre. The MoES would be the most ideal place, respondents indicated. However, there is a need for reassuring stakeholders about sustainability of the system. Findings also suggest that the Universal Primary Education (UPE) structures in the Ministry should be utilised for effective sustainability of SIMS in the country.

**c) Ownership and Initiation:** The respondents illustrated clearly that it is important to have a small group to work on the process to establish the SIMS. However, such a group should function with the support of the MoES. One student suggested that someone should be paid to implement this idea. According to the interviewees, MoES in conjunction with local government could implement it. This requires collaboration of the Ministry of Local Government and Ministry of Finance and Economic Planning, Population Secretariat and Manpower Development to develop such an idea into a policy. The development of such a policy requires commitment by stakeholders to own the system, and advocacy to ensure goodwill.

#### **7.9.4 Political will**

Political support, and hence lobbying and campaigning are crucial for the sustainability of an integrated SIMS.

**a) Political Support:** According to respondents, such support is a very important factor in the sustainability of an integrated SIMS. The idea should be sold to Cabinet. Responses indicated that politicians should be non-partisan towards educational institutions.

**b) Lobbying and campaigning:** Observations show that to gain political support, political lobbying and advocacy are called for. This will depend entirely on the views of the political leaders to legislate and pass appropriate acts. Respondents note that to some extent, the lawmakers should enact a law establishing the SIMS as part of the educational system. This will require parliament to be lobbied to review laws that control information regulations in the country. It was also suggested that members of Parliament ensure that their areas (constituents) receive appropriate facilities to ensure the sustainability of a SIMS.

### 7.9.5 Legal and Policy Issues

According to the findings, a policy on SIMS should be put in place and followed. It should indicate how the system would operate. Such policy is necessary to protect information and ensure that it is used for the purposes for which it is meant. Such a policy, if enacted, should give the SIMS strength and direction.

Such policy should clearly stipulate governance, coordination and lay down who may use such information and for which purposes. It should protect individuals who provide and utilise information. It was also felt that an emphasis on procedures regarding access to information of common interest e.g. academic information needs to be articulated in the policy. Such a policy calls for strategies regarding commitment and participation; for principles to be established; and for its integration into the government development programmes as explained below.

**a) Commitment and Participation:** The policy should provide for a high level of participation in the information management system at the national level. Responses indicate that there is a need to address and harmonise various laws regarding management of information to cover various areas or disciplines. According to respondents, the active participation of Government through the Ministry of Education and Sports is important in the implementation of such a policy. The stakeholders should be enthusiastic about the aims and objectives of SIMS.

**b) Policy Principles:** Amongst respondents, it was felt important that policy should stipulate guiding principles regarding regulations that govern the management of student information. It was also noted that the policy should ensure that the system is cost effective and guarantee data protection. According to the responses, it was as important for any policy to endeavour to utilise methods that reduce information loss. It was also noted that policies should ensure uniformity in records management in institutions. For example one administrator noted that a policy should clarify responsibilities for data entry, editing of information, and updating rights. Responses also indicate a need for data protection as well as copyright and similar rights, especially in this era of computerisation. Such legislation would strengthen the mandate of the Ministry to assure the protection of student information and protect against abuse. Hence, the majority of respondents suggest that a policy for a SIMS should restrict access, have software security, ensure file and password permission. Moreover, suggestions from respondents show that a system should detect

anomalies. Other supporters of a clear policy suggest a need to protect students' biographical data. It was noted that such a policy can utilise the existing legal framework as per the Local Government act, UNEB procedures, or the higher education registration procedures to enable easy collection of information regarding a student without excessive costs.

**c) Integrating policy issues:** As mentioned earlier in Section 7.7.3, to integrate a SIMS into the development programmes requires the establishment of an office responsible for coordinating student information. It was also noted that a SIMS needs to be integrated with the already established functions of local and central government to avoid duplication of effort. Proper delineation of the offices of district education officers, the Planning Department of MoES and the Population Secretariats and their SIMS responsibilities was called for. A strategy on how to link up with those offices is required. Respondents also suggested that one should use the expertise and facilities available for the EMIS and the Uganda Bureau of Statistics. Statistics departments in the districts, government departments and bodies, student guilds and council forums are of importance to the sustainability of a SIMS. Accordingly, it was suggested that the Ministry responsible for planning should develop a policy for SIMS integration in the country. It should also provide strategies for monitoring a SIMS in Uganda.

Implied in the above is that stakeholders' consent, advocacy and commitment are crucial to the sustainability of an integrated SIMS in Uganda. This however requires a strategy for applying it to various levels of the education system in the country, including higher education.

## **7.10 Suggestions for Higher Education**

In order to identify the implications of a SIMS for higher education in Uganda, all respondents were asked to make suggestions.

### **a) Utilising and establishment of information access points and structures**

Respondents noted that existing information access structures in higher education institutions could be utilised for coordinating student information in the country. It was also suggested that, higher education institutions should appoint an information officer (as explained earlier in section 7.6 (b)) who will be designated to be responsible for coordination of student information. It was furthermore suggested that higher education institutions should institute public access student information points where it is easy to access student information. It was also pointed out that to institute information access committees at various levels in higher education may facilitate the coordination of student information. The establishment of an information centre accessible to all stakeholders, providing information centres at halls of residence for effective dissemination and broadcasting a radio programme about information systems in the universities were suggested. Respondents also considered that the use of posters and the involvement of lecturers and politicians to communicate some of these issues were effective means to publicise the idea to the higher education community. It was also suggested that the utilisation of a Website containing information about SIMS is crucial for easy access to students' information.

### **b) Improved and unified records management systems**

According to the research results, there should be a unified system of managing student records, which would improve the current records management practices. The following are some of the suggestions made in this respect:

- Registrars' offices should strengthen their registration system at universities.

Adopting a common form for student data should be a priority amongst higher education institutions.

- A system to capture further data, such as that on health is required.
- A system to coordinate student information from primary, secondary, and respective tertiary institutions should be developed.
- Proper record keeping practices among stakeholder updated will facilitate the sustainability of SIMS in higher education.
- There is a need to expose students in colleges to the techniques of filling in forms online

- Findings also suggest computerisation of all processes and in particular SIMS functions in higher education.
- Higher education should have a common method of providing certificates (like affixing a photograph).

**c) Resource mobilisation and funding:** As already discussed in Section 7.9.2, respondents indicated that sufficient funding is required for a SIMS to be able to function. It was noted that it should be compulsory for any student of higher education to have a student identification number. This, however, requires the support of all institutions, government and other stakeholders. This calls for government support to facilitate the process. According to respondents, higher education institutions need to create an atmosphere of collaboration to collect funds.

**d) Involvement and ownership:** It was noted that as the issue of SIMS is a longterm project, it is strategic to start with involving the current students—those who are in school. It was also suggested that higher education should ensure that educators in institutions properly provide information during career guidance.

**e) Awareness and publicity:** The findings emerged clearly from the research that sensitisation about SIMS is a priority as discussed earlier in Section 7.9.1. From the research, findings suggest that more training should be given to the implementers and beneficiaries of such a system in higher education. Skills such as accessing information, leadership skills, lobbying skills, communication skills, computer literacy skills, and record keeping skills are crucial in the implementation of a SIMS in higher education. Sensitisation should aim at ensuring effective collection of data and at building capacity among the beneficiaries to understand the need for a system.

**f) Planning and evaluation:** Responses show that there is a need for planning and evaluation of a system. It was suggested that an evaluation strategy for a SIMS in higher education should be put in place. According to responses, the system should be able to evaluate itself. It should be able to prove the identity of any student, verify and track student information, and ensure and protect access to student information. Findings suggest that a policy should govern this [SIMS] implementation at national level. Respondents suggest continuous evaluation and follow up in order to achieve a successful, sustainable and integrated SIMS for higher education in Uganda.

## 7.11 Conclusion

It was the aim of this chapter to establish the needs and requirements for a SIMS in Uganda. These are diverse, depending on the education level and the current capacities of the stakeholders regarding the management and coordination of student information. In this chapter, it was established that to ensure tracking of student information in the country, an identification system with standardised procedures and a coordinating structure is required. The system would be effective if there are proper procedures for an effective filing system, together with informed, competent and committed stakeholders. The identification system requires a numbering system to be put in place along with a clear strategy for utilising existing structures, like the registration systems in education institutions to enable easy capturing and creation of a common register at various levels. Since higher education is the sector most affected by the state of student information, it should take a lead in improving service delivery in the management of students in Uganda. Higher education needs to own the system and to mobilise support for it in terms of policy and advocacy. Designing a system to coordinate student information therefore requires a suitable framework that would integrate such a system into the socio-economic development programmes and reforms in Uganda.

## CHAPTER EIGHT

### JUSTIFICATION OF A STRATEGY FOR AN INTEGRATED SIMS FOR HIGHER EDUCATION IN UGANDA

#### 8.1 Introduction

The main aim of the present study was to design a strategy for the coordination of a student information management system in Uganda. Chapters six and seven presented the empirical findings of this study, while this chapter consolidates and discusses them in terms of the given aim.

In chapters six and seven, the results of the empirical research into the phenomenon of a ‘SIMS’ were analysed, each research question at a time. In this chapter, the focus falls mainly on consolidating the facts in those chapters and the findings are related to the rest of the study in order to justify the design of the proposed strategy. Each research question with its sub-questions will again be discussed one at a time. The three main issues were to establish the state of the management and coordination of student information, the needs for and requirements of a SIMS, and the most suitable strategies to develop an integrated SIMS for higher education in Uganda.

The first research question was to investigate the current situation as far as the state of management and coordination of student information in Uganda is concerned. This objective was considered in chapter six of this study, which described the different types of student information being stored and ways in which they are coordinated between various bodies. Attention was paid to the processes followed and to respondents’ attitudes to the ways in which such information is managed and coordinated. The problems of the current system were identified.

In chapter seven research problems II and III were discussed: ‘What are the needs of and requirements for coordination of student information in Uganda?’ and ‘What are the strategies for an integrated SIMS in Uganda?’. In order to answer these two questions, the researcher identified respondents’ expectations regarding the importance of coordinating this information and the type of information to be captured at institutions. The research also identified the activities to be coordinated and justified the need for a SIMS in Uganda. Furthermore, the respondents’ reservations were



identified, as were the resources needed and the most cost-effective way to coordinate student information.

## **8.2 The current state of the management and coordination of student information in Uganda**

### **a) Student information stored in educational institutions**

It was observed that currently there are different types of student information being stored in these institutions, ranging from academic progressive assessment and personal data to registration status. The information kept depends on the purpose for which it is required in the given institutions. Most of it is intended for reference and for keeping track of a student in those institutions. Some records are inconsistent or incomplete and cannot be relied on to provide adequate student information in an institution. There is no standard format to enable storage and access to such data, which has limited the country-wide tracking of student information.

The findings recall observations by Kroenke and Hatach (1994:21), cited earlier in section 2.2.1, who argue that ‘a system seeks to achieve a set of related goals and shares a common model of action’. This is not present in the current SIMS in Uganda. This situation has also affected the employment sector because of lack of coordination between the institutions where students have studied. Although some attempts have been made in other countries to define a policy regarding student information, for example, the US Family Education Rights and Privacy Act of 1974, the Federal Register (34 CFR part 99) and Statistics Canada (2003) as cited in section 5.5.5, this has not been applied in Uganda yet.

### **b) Processes and procedures in coordination of student information**

It was established that absence of procedures to coordinate information has limited the ability to track students in the country. In section 2.2.3 Tudor and Tudor (1997:3) are cited; they emphasise the need for organisation in the way in which different elements are made to interrelate in a given environment. Although there are attempts at achieving uniformity in most processes involving the collection of student information, including admission, registration and awards, uniformity remains incomplete without a strategy to coordinate its input countywide. This is why in designing systems, as observed by Eardley (1995:201-210) (see section 2.4.3), it is important to combine features of data-driven and process-driven approaches at all levels of management (strategic, tactical and

operational). The research shows that such a SIMS should embrace functions including admission, registration and enrolment, examinations processing, qualifications and awards, verifications and certification of information, compiling of statistics, keeping security and protection of information and identification and access to student information. While most of these functions are carried out at the institutional levels, there is no strategy for coordination on the national level.

### **c) Positive attributes of the SIMS in Uganda**

The research illustrates a number of activities undertaken in different institutions in an effort to coordinate student information. For example, UNEB has attempted coordination of information but the data kept is limited to examination purposes and UNEB's coverage is limited to coordinating information at levels below tertiary education. However, the data provided by UNEB constitute an important input for the management of student information in higher education. Furthermore, the literature review in Section 4.4 shows disparities in the responsibilities of the major stakeholders at central government, local government and institutional levels. Although Section 4.5 describes the role of MoES in student information management, there is no strategy for coordination of this information. Section 5.3 and in particular Table 5.1 confirm that, at institutional levels, there are a number of functions ranging from administrative to academic transactions that aim at processing information in different ways. As stated in chapter 4, in order to coordinate student information, all institutions and examination boards should apply a specific system in data collection, utilisation and sharing. In Chapter 5, a number of significant attempts in the coordination of student information at the national level are discussed. No system is in place to store the accumulated records of a student to facilitate easy coordination. This requires full integration as is indicated by Douglas and Glen (2000:687), cited in Section 2.3.

### **d) Challenges of a SIMS**

The current research has demonstrated that there are inadequate standards regarding all aspects of the processing of student information, which have limited the security and usability of this information.

The issue of an effective SIMS is actually a global challenge, as observed in Section 3.4.4, which showed that the current international standards and agreements do not address the issue of

coordination and identification of information. Certain attempts at standardisation, access, data security and protection have been made in countries like Canada, the UK, and the USA both at institutional and state/national level, as discussed in chapter 5.5. Although some of these attempts are important, a strategy regarding how they can be adapted for Uganda's own educational sector is required.

Already in 1985, as shown in section 2.4.2, the development of a SIMS was perceived as a major challenge for higher education (Ewart 1985:271). Ewart names such challenges as the planning, management and control of information systems. Designing a framework for the development and operations of a SIMS in higher education is consequently a priority. The challenge remains, as Ives noted: what needs to be done for a system to be successfully implemented in an integrated environment? (Ives 1991:38, cited in section 2.4.2.)

### **8.3 The needs and requirements for a SIMS in Uganda**

It was established that the needs and requirements for a SIMS in Uganda are diverse.

#### **a) Importance for coordination**

The research aimed to establish why it is important to coordinate a SIMS. The main reason is to facilitate tracking of student information and to enable its proper verification, among other functions. These aspects depend on effective harmonised standards regarding information that range from educational background, a student's biographic data, achievements and awards, abilities, to behaviour and discipline. Many authors, like Churchman as referred to by Busha and Harter (1980:124), cited in section 2.2.1, define the purposes of a SIMS in terms of the principles of general system theory, while Elorrio (1977:17), cited in section 5.4, describes such principles in terms of a coordinated environment. These authors do not, however, clarify how a SIMS can be integrated into the education sector programmes and reforms reflected in Chapter 4.

## **b) Student information and activities to be harmonised**

The harmonisation of the processes related to such information depends on the purpose for which it is kept. Respondents suggest a need for a register that would function as an access point at all levels in Uganda. This requires that the existing organisations take a lead to provide standards, because at the moment, no institution is responsible for such harmonisation. Certain systems elsewhere have attempted harmonisation of data capture and storage, as discussed in section 5.3.3: the PEIMS of the Texas Education Agency and HEMIS in South Africa. The former captures data through electronic collection, standards, and edit procedures, as does HEMIS.

Harmonisation of student information is a global need; for example the American Association of University Professors, the National Education Association (NEA), and the American Association of Collegiate Registrars and Admission Officers (AACRAO) (see section 5.5.5) have participated in the enforcement of a code of ethics and practice. However such standards lack a strategy for their integration into higher education programmes and strategies in the intended environment.

## **c) Benefits of a coordinated SIMS**

It is obvious from the study that users of a SIMS should be able to keep track of student information at all levels. It is clear that a coordinated SIMS would ease accessibility to such information. It should lead to a well-planned and balanced education system. Findings also suggest that a coordinated SIMS will enable proper use of records. This will avoid duplication of data in educational institutions, eliminate double admissions, impersonations, and decisions based on inadequate data, among other problems. Hence it is important for a country like Uganda to develop a strategy in this respect.

## **d) Reservations regarding a Coordinated SIMS**

In the empirical study, one of the major reservations expressed was the cost of implementing a SIMS in Uganda. Nevertheless, respondents suggest the utilisation and improvement of the existing structures, and channels, and also point out that proper record keeping in educational institutions will facilitate easy collection, access to and use of student information.

However, lack of privacy and confidentiality, as well as the abuse and misuse of such a system, were regarded as some of the expected hindrances in the implementation of the system. It was also established that reluctance among some people to co-operate, or ignorance of and variations in information management skills, may limit coordination. A policy to enforce proper records keeping in educational institutions is a priority, reinforced by a comprehensive programme for sensitisation of stakeholders regarding the subject. Enforcement of such a policy however should allow more efficiency of all users of the system, as mentioned earlier in section 5.3, to enable easy tracking of student information (University of Tasmania 2001:1).

#### **e) Keeping track of student information**

To keep track of student information in a country, there is a need for a centralised and unified system that would identify a student's information, store it and ensure its accessibility to appropriate users in a distributed access environment. Standardised procedures and activities, a comprehensive policy, and competent and committed staff are all necessary to ensure that student information is kept track of.

### **8.4 The strategies for an integrated SIMS in Uganda**

There are a number of strategies for the design of an integrated SIMS.

#### **a) Student identification system**

To define a student identification system for Uganda implies a strategy to define the hierarchical levels of systems as well as the data attributes, procedures and requirements for establishing an integrated SIMS in the country.

Many authors such as Jones (1982:37), Angell and Smithson (1991:167), Downs (1992:2) and Eardley et al. (1995:210), as cited in section 2.4, believe in an entity-relationship model that identifies the entities and their relationship in the design of an integrated SIMS. Such a model calls for a strategy to integrate its features — entities, attributes and relationships — into the environment for which it is intended. Findings from this research show that a national student identification system is a major factor to facilitate tracking of a student in the country. The identification system,

however, requires supporting information: for example, as discussed in section 5.3.2, at the Texas A and M University (2002), the date and month of birth make up a Personal Identification Number (PIN) that is assigned to a Social Security Number (SSN). Such a system should be compatible with other identification systems in the sector as indicated in section 3.5 and in chapter 5. These include employment, census, voters register, immigration and migration, and birth and death registration systems. As indicated in figure 5.1, this requires linkages to the main stream of SIMS in the education sector. There is a need for training and education in records keeping, advocacy, media and publicity and for utilising the available structures that allow access to student information. Involvement of local governments in verification of students and evidence of registration at an institution should be considered as additional requirements for any identification system. This however requires careful assessment of the needs of each category of stakeholders and a policy that should govern the coordinating body to facilitate the process. This is why current initiatives, efforts and laws like a national ICT policy, educational management information systems and a decentralisation strategy as described in Chapters 3 and 4 need to be taken account of when designing an integrated SIMS for higher education.

#### **b) Sustainability of an integrated SIMS in Uganda**

In terms of the researcher's aim, empirical results indicated five main strategies: education and training, proper funding, a reliable management structure, political good will and integrated policy for development strategies. As was explained earlier in section 2.2.4, strategies for ensuring the sustainability of a system call for an integration of the internal environment, the operating environment and the general environment (legal, socio-economic and technical) (Cleland & King 1983:23). As Lucas (1992:17 and 90), also cited in section 2.2.4, believes, in designing a system there is a need for integrating all the variables and parts of a system with the external environment or factors. In fact, as explained in section 5.5.4, the World Bank (1994:26) gives directions to governments to introduce policies explicitly designed to give priority to the objective of equity.

#### **c) Suggestions for higher education**

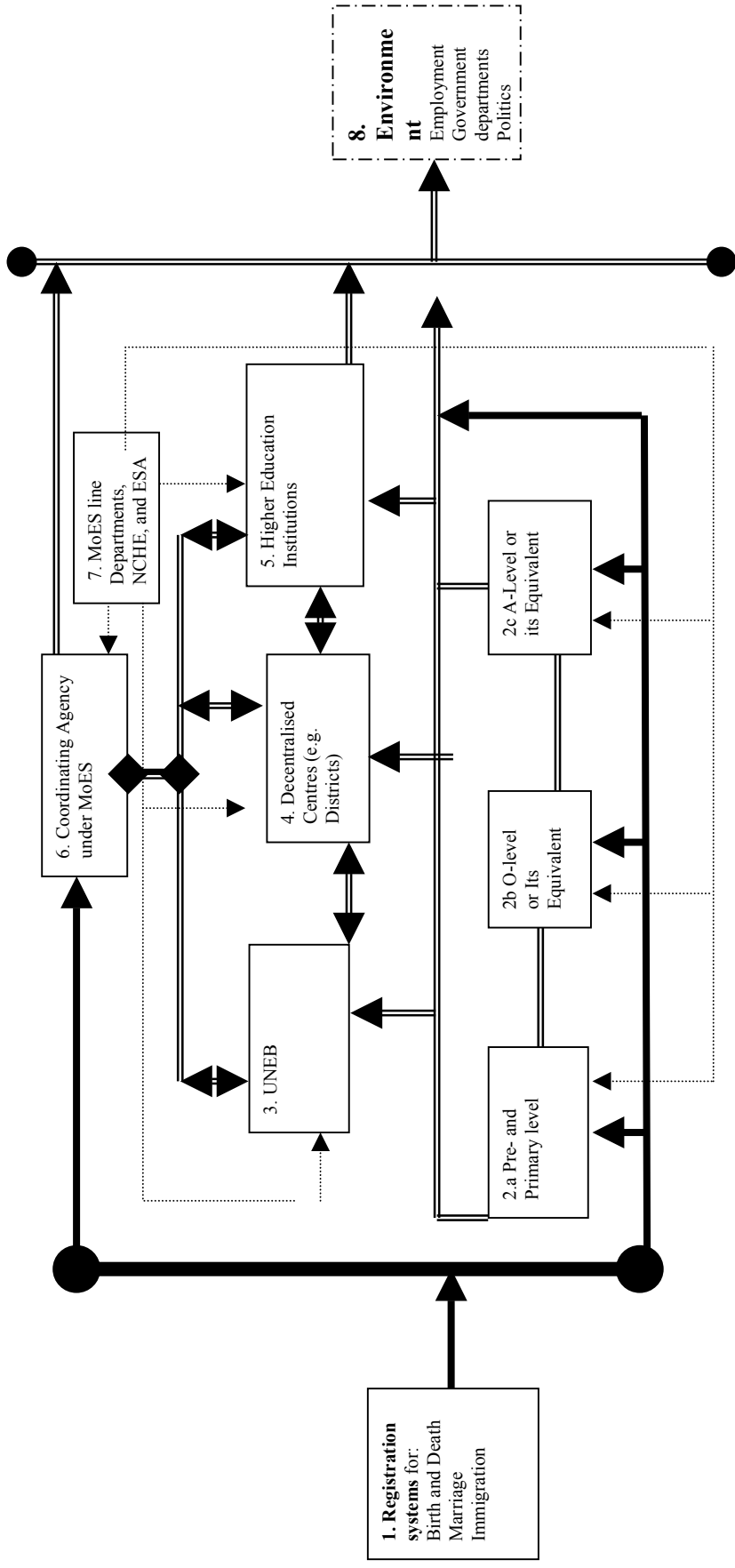
It was established from the research that since the higher education sector is the one which is most affected by the state of student information in Uganda, it should take the lead in improving service delivery in the management of this information in the country. Further more, the fact that higher education links up with various institutions including UNEB, schools, MOES, districts and other

sector departments, a strategy is also necessary to enable the coordination of student information that is well integrated into the socio-economic development programmes and reforms. This need had already been recognised by the government of Uganda, as discussed earlier in section 4.2, at the time of independence in 1962 (The University of East Africa 1962:94).

## **8.5 Observations**

- Absence of adequate standards in Uganda has limited the access to and usability of student information. This has impacted on the ability to keep track of a student, as has the lack of a centralised coordinating system in Uganda. The coordination of student information will assist in creating and maintaining a proper profile for each student in the country. The functions performed at various levels in Uganda lack a strategy for such coordination. Lack of unified procedures in the capture of information has also limited the sharing of student information. Although there are current efforts towards coordination of student information, no unified and harmonised procedures are in place to enable the tracking of this information in the country.
- Secondly, it was the aim of the researcher to establish what it requires to ensure coordination of student information. By means of the research, it was established that a system to identify this information would facilitate keeping track of it in the country. To integrate such a system into the development strategies for the education sector, a strategy is necessary to utilise the programmes that already exist at institutional, local government and national levels. The ability to track, access and utilise student information and coordination of information at all levels will assist in creating a balanced and integrated SIMS in the education system in Uganda. This however necessitates a strategy to guide its sustainable implementation. This in turn calls for a coordinating agency (see proposed structure for coordination of student information in figure 8.1) that would set standards and ensure the proper identification of a student. Sustainable strategies for funding, education, training, legal and policy matters, and political goodwill are important in an integrated SIMS.

**Figure 8.1: Proposed Structure for Coordination of Student Information**





Key

1. ..... Controls and standards
2. **—** Biographic data entering the system from outside the education system
3. **==** Student information movement within the education system and after completion
4. - - - - - Open to the environment

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## **Explanation of Figure 8.1**

Box 1 represents the various registration systems including those of birth, immigration, marriage, death, etc. Such registration systems provide biographical data concerning a prospective student/pupil as he enters an institution at any level of the education system. Note that the registration systems (Box 1) would provide information to educational institutions. This information would enter the system at all levels of education: Pre-primary and primary level (Box 2a), O-level (Box 2b), A-level (Box 2c) and higher education (Box 5). This information should be reflected in the coordinating agency (Box 6) too. This agency coordinates information with higher education institutions (Box 5), UNEB (Box 3), and decentralised services (Box 4). The coordinating agency coordinates data with line or sector departments in the education sector (Box 7) as shown in appendix 4.2.

When a pupil enters pre-primary and primary education (Box 2a), data begins to accumulate. At the end of the primary level, a pupil writes the national Primary Leaving Examination (PLE). For such a purpose, a candidate is required to register with UNEB (Box 3). When the same candidate is admitted to secondary education (O-level) or its equivalent, his information is transferred to the institution where he is admitted (Box 2b). The same process of registration for examination and admission applies to O-level (Box 2b) and Advanced level (Box 2c) when entering higher levels. In the execution of its duties, the coordinating agency in MoES would be able to handle these activities through decentralised services at district levels that perform the coordination function.

At each of these institutions, there is a student register or database; these are hyperlinked with each other. The UNEB register contains the results of students at the institutional levels as indicated by boxes 2a, 2b, 2c, and 5. The same levels store information about students at decentralised centres (Box 4). At all the levels where a student's information is stored, it is identified by a student identification number as a key field.

At advanced level or its equivalent (Box 2c) a student registers for UNEB exams. He also applies to MoES and a copy of the application goes to the higher education institution of his first choice (Box 5). The MoES possesses semi-autonomous bodies that are concerned with policies, standards, and monitoring at all the levels of education, as indicated in Box 7. The

dotted lines in the figure [number 4 in the key] illustrate standards, controls and policies at various levels in the education system. At the completion of each level of education, including higher education, the student's information enters the environment (Box 8). The environment makes use of student information from the coordinating agency, higher education institutions, or any lower levels of education.

## **8.6 Conclusion**

The researcher intended to establish strategies for an integrated SIMS in the country. A well-designed system would ensure easy access and would reflect functional identification of an entity — a student's information. It can therefore be concluded that a framework for an integrated SIMS should be designed to reflect the principles of the higher education environment in Uganda in which the SIMS functions. The challenge is how to do so.

The succeeding chapter offers conclusions and makes recommendations based on the foregoing research.

## CHAPTER NINE

### CONCLUSIONS AND RECOMMENDATIONS

#### 9.1 Introduction

In the previous chapter, the focus fell largely on consolidating the facts in chapters six and seven and discussing them with the rest of the study findings in order to justify the design of a strategy for an integrated SIMS for higher education in Uganda. It was established that the absence of an integrated system limited the proper coordination of information. A design for such a system was therefore needed.

This chapter gives the conclusions and recommendations of the study. The conclusions consolidate the main problems of the study and the research questions discussed in Sections 1.3 and 1.4 respectively with the findings presented in Chapters 6 and 7 as discussed in chapter 8. Focusing on the aim of this study — designing a strategy for the coordination of a student information management system, which was justified as observed in Section 8.5, this chapter recommends such a strategy, which takes account of the gaps reflected in the conceptual framework discussed in Chapter two. Evaluation criteria and their implications for higher education are also provided.

#### 9.2 Conclusions

This study was undertaken to establish the current state of the SIMS in Uganda. Given the present inadequate knowledge of the needs and requirements for a SIMS in Uganda, the study was motivated by the desire to discern what would be needed to establish a SIMS in the country.

In this study, it was established that educational institutions in Uganda manage student information independently and in their own way. The researcher also identified that there are no common standardised procedures and programmes for capturing, processing and storing this information in institutions of higher learning. It was therefore argued that it is difficult to keep track of the necessary operations and procedures in the management and coordination of

such information. The researcher also observed that there is no centralised storage of this data in various institutions of higher learning, and that as a result information is scattered in institutions and, even if available, is not stored in any standard format, which hinders coordination. It was also established that there are no guidelines on how different institutions can share student information in Uganda, and that therefore it is not easy to coordinate such data in the institutions of higher learning.

In addition, it was confirmed that there are no established facts concerning what a student information system should be able to accomplish and what would be required to put in place an effective system. It was also observed that no standard definition exists of what constitutes an integrated SIMS for higher education. It is therefore highly probable that the lack of a national student identification system to provide a common format for identifying a student will limit the tracking of student information in Uganda. Although the government recognises the need for information management, no attempt has been made to address it. Nobody knows exactly what an appropriate student information management system for Uganda should contain. Lack of a national student identification system has affected coordination of the necessary information. This limits the integration of such a system into strategies regarding the education sector. The researcher established that an enabling strategy for an integrated SIMS should facilitate tracking of this data in the country.

A conceptual framework for an information management system (IMS) was therefore developed in Chapter Two to identify and discuss various factors in the study and their relationships. The literature reviewed in chapters two to five has shown that there is no single system that can be solely relied upon to design an information management system. Five features of the study and their relationships were identified that constituted the constructed conceptual framework for this study — an IMS (See figure 2.1). The features of an IMS considered were denoted by ESSIF, referring to **information environment, structure, information system, integration strategy and framework.**

Chapter Three examined the current state of the **information environment** in Uganda. It traced the socio-economic profile of Uganda. The chapter also described the global strategies for and standards in information management. Policy and institutional frameworks, and the implications for higher education in Uganda, were discussed. It was clear that even though

there have been efforts towards developing the information sector in Uganda, there seems to be no strategy to guide the development programmes (regarding the information management system) that are being introduced in the country.

In Chapter Four, the current **structure** of the education system as regards the management and coordination of student information in Uganda was explained. In that chapter, the information coordination challenges for higher education were discussed and analysed. It was noted that with the increasing number of student enrolments in higher education, there is a need to keep accurate track of them, which requires proper identification of an entity (a student's information). This is why it was important to explore various student **information systems** outside Uganda in order to establish strategies for designing an integrated SIMS for higher education in Uganda, as was discussed in Chapter Five. The chapter describes such a SIMS. The features of an integrated SIMS are explained and gaps are identified. It was established that although some countries have attempted to design national student information systems, very little has been done concerning tracking a student in a country, and generally, no **strategy** is provided that can enable the integration of such a system into the environment in which it is designed to function.

In designing an **integrated strategy**, the study was limited to considering a SIMS for higher Education in Uganda. The study was conducted using a qualitative research framework that provided a coherent set of propositions that explains the phenomenon of a SIMS. The phenomenological approach of qualitative research represents the various aspects of a system described by data, processes, and events related to information about a student that describe the subject of the study. To carry out research into developing a SIMS, the researcher purposively selected various respondents (including key informants, administrators and student leaders). These included people involved in the processing of student information in various institutions in the education sector.

Considering what has been established (in Chapters Six and Seven), and the discussions that followed in Chapter Eight, it is clear that there is no record that can be relied upon for providing complete information about a student in the country. There is no system in place to coordinate student information and no follow up on student information in the country. The absence of a **strategy** for integrating student information into the education sector and the

reforms has limited the ability to keep track of this information. **An identification system** which can enable the integration of a SIMS into the socio-economic development programmes and reforms in the country appears to be the way forward. This however necessitates a framework to enable such integration. Generally, one may therefore conclude that:

The absence of an integrated information management system (IMS) in any environment limits the proper coordination of information in such a system. On the other hand a system that is able to identify an entity (student information) facilitates such integration into the intended environment; this requires an appropriate strategy. To design one, a framework such as that discussed in the previous section defines the principles according to which the design is created and its parameters, which include purpose, inter-relatedness, integration and coordination. Such a framework also defines the evaluation criteria and the implications of the system in order to foster its sustainability in socio-economic environment of Uganda.

It can therefore be deduced that an integrated IMS is a purposively designed information system that coordinates the identified entity (data related to a particular entity, for example student information) with the intended requirements.

### **9.3 A Framework for an Integrated SIMS for Higher Education in Uganda**

The Government of Uganda has set the modernisation of the economy as one of its main priorities in national development. This task focuses on national integration of the socio-economic and political needs of the country as a basis for building an independent, integrated, self-regulating national economy, as discussed in section 1.1.2. This is reflected in the main strategies of *Vision 2025*, which provides for the development and effective utilisation of information systems and services in this regard (Government of Uganda. Ministry of Finance, Planning and Economic Development 1999<sub>a</sub>:86).

Effective utilisation of an information system implies the ability to use data for decision-making. The development of the education system in Uganda has been characterised, however, by a lack of reliable and up-to-date educational data, among other issues. This has affected the way student information, as a resource, is managed. Since higher education in Uganda exerts a major influence on the development of the education system in general,

effective management of student information at this level requires better coordination and effective utilisation to foster national development.

It is recommended that a framework for an integrated SIMS be designed to reflect the principles of the environment in which the SIMS functions. This framework should define an integrated SIMS, articulate its purpose, and lay down its objectives. It should explain how a coordinating system would facilitate tracking of student information. It would also define the contextual boundaries of a SIMS in the education sector.

To keep track of this information, a student identification system should be designed to facilitate the coordination and maintenance of a national student register. Standards will have to be set in place and maintained. Sustainable strategies which take account of the indicators of a successful SIMS are crucial. A framework for the SIMS will define the principles in terms of which the design is created. It will define the parameters of the system in terms of purpose, inter-relatedness, integration and coordination. The structure of the coordinating body will also be defined as well as the way in which it interlinks with the lower levels of the system. The evaluation criteria and the implications for higher education will also form part of such a framework.

## **Recommendation**

It is recommended that the following design features define the proposed framework:

- The principles underlying the design of an integrated SIMS.
- The environment in which the integrated SIMS will operate.
- The purpose and functions for which the integrated SIMS is designed.
- Sustainability strategies including education and training, funding, management structure, political will and legal and policy guidelines.
- The evaluation criteria for an Integrated.
- The implications of SIMS for higher education in Uganda

More detailed recommendations will now be provided in respect of each design feature.



## **9.4 Principles of an integrated SIMS**

### **Recommendation**

In terms of the views of various authorities, including von Bertalanffy (1968), Alorrio (1977:17), Award (1993), and Lucy (1997), it is recommended that an integrated system should function according to the following five principles:

1. To integrate a system into its environment, the relevant socio-economic, political, and technological factors should be incorporated into its design.
2. An integrated system should be designed within the contextual boundaries defined by the structure within the environment
3. Systems functions should be coordinated and linked in a structure
4. A coordinated system should be able to identify an entity — the student about whom information is stored for purposes of identification.
5. To manage the integration, the design should not only take care of the needs and requirements but must be sustainable within the system's environment.

## **9.5 Integrated SIMS environment**

In order to design a system responsive to the values, culture, practices and principles of Ugandan society, it is important to define the environment within which the SIMS is designed to operate.

### **Recommendation**

It is recommended that the environmental factors listed below which may interact with and/or influence the success or otherwise of the SIMS, be taken care of.

1. The constitution of the Republic of Uganda: Article 41(1) provides for the right of access to information in the possession of the state or any organ or agency of the state except where the release of such information is likely to prejudice the security or sovereignty of the state or interfere with the right of privacy of any other person. This is discussed in sections 1.1 and 3.5.
2. *Vision 2025* recommends an environment that will foster the development of information

and communication in Ugandan society, as discussed in sections 1.1 and 3.2.

3. The Local Government Act, 1997, gives effect to the decentralisation of functions, powers, and services to ensure good governance and democratic participation in control of decision-making by people, as discussed in section 4.4.2.
4. Liberalisation has drastically changed national and technology policies, which in turn have liberalised the telecommunication services as explained in section 3.3.
5. Policy initiatives in the information sector, such as the National ICT Policy Framework, the global information strategies, and the proposal concerning access to information policy, as discussed in sections 3.3, 3.4, and 3.5, may exert an influence.
6. Existing management structures and coordination of functions within the Ministry of Education and Sports, Uganda National Examination Board, National Council for Higher Education, Educational Standards Agency, universities and other tertiary institutions and schools, as discussed in sections 4.5 and 4.6, will also play a part.
7. It should be kept in mind that this is a sector information system. Links with other line sector information systems and the national networks should be taken account of. Care should be taken to ensure direct and indirect benefits to the community, while using local and national information resources and sources to access student information as explained in section 3.5.
8. At the institutional level, the design should take note of existing systems and functions, local area networks and the structure and governance of the institutions as explained in sections 4.4.3 and 6.3.

## **9.6 Purpose of an integrated SIMS for higher education**

In section 2.2.5, the researcher accepted the definition of a system as ‘a purposive designed information system that integrates the elements/parts and their relationships with the socio-economic requirements and needs of its environment’. It was established that in order to integrate an information system in any environment, the entity relevant to this study should be defined. An integrated SIMS for Uganda should aim at keeping track of information about students in Uganda. Four main objectives of an integrated SIMS for higher education in Uganda therefore basically exist:

- To enable easy identification of student information so that it can be tracked within the country.

- To maintain a national register of student information in the country
- To provide coordination of student information within the organisational framework in the country.
- To ensure standards in collection and exchange, protection and safeguarding of student information in Uganda.
- To provide strategies for the sustainability and implementation of an integrated SIMS in this country.

## **Recommendations**

On the basis of the findings of the study and the discussions that followed, the following policy positions are recommended:

### **1. Establishing a national student identification system**

A national student identification system should be put in place by laying down a policy. The system should create a national student identification number. This number would be allocated once, when a child first enters a school in Uganda. It should be used at every registration at all levels and in all institutions of education. For the purposes of carrying out particular functions, other identification numbers can be issued, for example, an index number for examinations, as used by UNEB. The coordinating agency would formulate carefully developed guidelines to define the numbering system, which would include information based on gender, date and place of birth, place of origin, institutions entered and levels of education as may be determined by the agency. This number should be able to link a student with other sector services such as employment. The MoES, in liaison with local governments, would devise the policy for such a system.

### **2. Maintaining a national register for student information**

There should be an integrated National Register for student information, maintained at the school, district, higher education and national levels. This calls for a classification system stipulating how the registers would be linked with one other. A standard format must be put in place for such a register to be compiled. A catalogue/access point for student information,

which will offer vertical and horizontal hypertext links to other registers, will be necessary.

### **3. Establishing a coordinating agency for student information in the country**

A centralised SIMS, with a unit/bureau/secretariat in the Ministry of Education and Sports to act as the coordinating agency, should be put in place. A clear management structure to link the SIMS with other information provision services at decentralised levels of governance, and to connect educational institutions with an online interactive information service, is essential. The agency would liaise with other sector related registration systems like Statistics, Employment, and Immigration (Passport Office), Birth, Marriage, and Death Registration services as shown earlier in figure 8.1.

#### **a) Establishing decentralised student information centres**

Within the decentralised system, each district would serve as a depot/bureau—as a student information collection centre. The system should be able to link various depots within and between districts. The bureau would offer an archival repository service for the purposes of preservation of records of permanent value. At each bureau/depot, there should be a warehouse system. It should be able to identify the data and the data source, as well as to store, keep a profile of (register), and preserve student information. The bureau should be able to promote the effective use of student information.

#### **b) Ensuring linkage of institutional student information centres with other systems**

The main purpose of the system is to provide for the exchange and use of data at various education and government levels. This consequently demands specific data centres in institutions of higher education for specific tasks. Universities should maintain student information centres that link with the Ministry of Education and Sports, UNEB, and related sector systems including the Uganda Bureau of Statistics, employment services, immigration and migration, and the birth and death registration system. Such linkage will facilitate easy tracking of student information in the country.

#### **4. Establishing a policy for the protection and safeguarding of student information in Uganda**

A policy for safeguarding student information in higher education is required. It should detail access, ethical standards and practices. A policy would also specify standards for the exchange of information, transfer of awards, and certification of student information including electronic, paper and audio-visual protection.

#### **9.7 Sustainability of an integrated SIMS**

In order to ensure the sustainable integration of SIMS into the socio-economic environment, the following four strategies are proposed.

#### **Recommendations**

##### **a) To ensure a literate, sensitised and well-informed society**

Uganda's future development will largely depend on the quality of the country's human resources. To develop a conducive environment for access to student information, the following strategies are recommended:

- The MoES should undertake a programme for sensitisation of stakeholders regarding the need for an identification system, for record keeping and for safeguarding access to and use of that information.
- A sensitisation programme concerning the management of records in educational institutions is necessary. Library and Information Science training institutions could start purpose designed short certificate courses in management of records, such as educational records, for various groups.
- A 'training of trainers' programme offered by the MoES and/or Public Service in records and information management could be started.
- The Ministry of Education and Sports could arrange refresher courses for administrators in education institutions dealing with record management.

- An information career guidance package could be developed by higher education institutions to guide career guidance counsellors in schools.
- The Ministry of Education and Sports and that of Gender, Labour and Social Development could promote non-formal information management programmes in the districts and community.

#### **b) Ensuring a sustainable infrastructure and funding for a SIMS**

Enrolment in Uganda's higher education has expanded rapidly without a corresponding increase in the availability of resources. The following strategies might provide a balancing effect.

- Each institution should develop a funding strategy to sustain the management of student information.
- A pilot project for a SIMS could be started to measure the feasibility of its adoption and its cost effectiveness.
- The Ministry of Education and Sports should formulate a policy regarding the implementation and funding of such a system: for example, providing a strategy for the raising of a participation fee to be paid by students registered in each institution.
- To start the project off, a feasible proposal for development partners could be created to source funds for the project.
- Government support in terms of institutional linkages and training would be required.
- In the budgetary allocations of the Ministry of Education and Sports, and local councils, an amount could be voted at all levels of governance to support the implementation of a SIMS. Accordingly, there is a need to exploit the existing opportunities offered by the education tax levied by local governments.
- There is a need to ensure that a SIMS for higher education utilises the local and available resources in capturing, storing and utilising student information. The technologies should be used as tools and should not drive the system. However, the resources used must comply with the established standards.

**c) To ensure a coordinated management structure in the management of student information**

Higher education institutions are not coordinated and therefore do not constitute a system. This situation makes it difficult for such institutions to exchange student information even between themselves. A coordinating management structure is therefore necessary. Appropriate strategies would include:

- A team should be set up or identified to initiate the idea and start advocating a SIMS in Uganda. The team should be responsible for developing the proposal and defining the strategy to implement it.
- Establishing an advisory committee or body for the coordination of a national student information system at various levels.
- The country should develop a coherent policy concerning the identification of a student.
- The existing Vice Chancellors' and Registrars' Forum should address the issues of accreditation, verification and credit transfers. An association of Registrars could be formed to collaborate in addressing ethical issues related to admissions fraud and confidentiality of information.
- The government should establish a directory of professional and occupational associations and bodies that directly or indirectly contribute to the development of the education sector, such as mentioned above. Such bodies would help to coordinate and maintain the professional registers of their members in the country.
- A technical committee responsible for telecommunication issues could be established to ensure the security and network reliability of the SIMS. This committee would work hand in hand with the national ICT policy committee.
- A unit/bureau for student records and information management should be established in the MoES.
- The National Council for Higher Education should ensure the effective implementation of the Universities and Other Tertiary Institutions Act.
- The involvement of student leaders and the student community would provide the channel for protection of students' interests and their welfare.
- The Ministry's strategy would spell out approaches to partnerships, flexible information access nodes, and other collaborative ventures. The following collaborative arrangements

are suggested:

### **(1) School — college co-operation**

Co-operation should be fostered between higher education administrators and head teachers in schools. A consortium could focus on examinations, planning future trends in education, creating a sense of belonging, and removing unnecessary restrictions in colleges. The body should make available data concerning the mobility of students during their studies, mutual recognition of the qualifications awarded following the completion of a programme, and access to other university programmes through the credit system.

This linkage would not only assist the education authorities, but also the professional bodies who would be involved, as well as keeping communities informed. Such co-operation would show the value of the proper use of student information to all stakeholders.

### **(2) National collaboration**

National professional and occupational associations should take a leading role in policy making and advocacy. They should identify policy issues in the management of student information that are important to their members. The NCHE should compile a directory of all institutions accredited by the recognised agencies and professional bodies. The government through the Ministry of Education and Sports should also establish a directory of professional and occupational associations and bodies that directly or indirectly contribute to the development of the education sector. Occupational associations such as the association of Principals and Vice Chancellors and that of registrars and administrators could help in setting information standards, as would professional societies, for example, the Law Society, the Uganda Teachers Association, the Uganda Library Association, and the Uganda Medical Association among others. Collaboration between these bodies would be encouraged in order to:

- Promote the value of sharing information about students, and of support and training in its use.
- Incorporate information literacy across curricula in all programmes and services and through collaborative efforts at various levels.



### **(3) Information service**

Universities and other tertiary institutions should improve the career guidance methodology used in schools. The authorities in higher education could develop a career guidance manual. Higher education should build web-based portals that allow access to student information. This would also act as a portal to provide information to the people within and outside the university

#### **d) To foster a political will which is conducive to, and to create legislation and policies for the management and coordination of a SIMS for higher education**

The government should strongly advocate the use of information technology throughout Uganda by its attitude, policies and legislation.

- A policy to advocate access to and use of student information should be put in place. The issues of open access, the possibility of sharing information on networks, and the right to access information need to be addressed. The constitutional provisions regarding access to information should be properly integrated into the development programmes.
- There would be a need to put in place educational rights and privacy regulations. A definition of what information is required for particular functions (like admission and registration) is important. It should cover issues such as changes of names owing to marriage or for religious reasons and the use of an affidavit. It is also important to formulate a policy to specify what information should be provided on the transcript and to spell out the rights of students in respect to educational records. Uganda is presently discussing the Access to Information Bill (Uganda 2004<sub>c</sub>), and such issues should be considered in legislation. A national verification and certification system needs to be developed.
- It is important to utilise the Uganda National Bureau of Statistics database in the course of the establishment of various bureaux both at national and district level for purposes of data collection, storage and dissemination.
- The *Uganda Citizenship and Immigration Control Act*, Act 3, 1999, provides for compulsory registration of all Ugandans, the issue of national identification numbers and of national identity cards. One registers when one enters school. The national identification number could be used in generating the national student identification number. Similarly, the provisions made by the *Births and Death Registration Act* No. 28 of 1970 exert much

influence on the student identification system. The Act makes it mandatory for parents to register their children within 3 months of the date of birth or death. There is a need to harmonise these two laws concerning what information to capture, when to capture it and how to identify the information captured. As well as a more definite policy regarding the student information identification system a policy to establish a national student centre/archives for the purposes of preservation and conservation of student information is necessary. This requires a statutory instrument to invoke the existing National Records and Archives Act, 2001.

A coordinating system would endeavour to document all the progress made towards an integrated SIMS.

### **9.8 Evaluation criteria for an integrated SIMS**

Indicators of a successful SIMS in terms of governance, programme and qualifications, quality assurance and funding need to be determined. They should aim at establishing quality, cost and reliability. The system should be able to furnish its anticipated system outputs. The system should also function within the programme budgets and projections. Based on the environmental features explained above, the following are proposed as the specific indicators of an integrated SIMS:

#### **Recommendations**

- The Education Standards Agency would set up quality indicators that specify the performance of a SIMS in Uganda
- The National Council for Higher Education would set the standards required of each institution of higher learning
- It would be a requirement laid down by UNEB that every examination centre meets certain standards when registering students for examinations
- The National Curriculum Development Centre should put in place a monitoring tool for ensuring incorporation of records management skills into schools' curricula
- The Uganda National Student Association (UNSA) should utilise their existing structure to understand student attitudes and create a mechanism to promote the SIMS amongst its members.

- District education committees would provide forums in which evaluation and assessment of the progress of the SIMS in the district take place.

If all conditions were favourable, the following would represent some of the outcomes of an integrated SIMS:

- A student is accurately identified whenever the information is required
- There is a standardised format to capture student information in educational institutions
- It is possible to coordinate student information in the country
- An integrated National Register for Student Information is maintained
- A policy and code of ethics for the management of student information in Uganda are in place
- One is able to track information about a student in the country using his number
- The SIMS is integrated into the education sector and reforms
- Security and protection procedures for student information are followed
- Institutions have well managed record centres and it is easy to access student information
- A national system exists, operated by a coordinating body
- Information is received on time and is accurate
- Queries are answered with a minimum of bureaucracy and delays
- The rate of forgeries and impersonation decreases.

### **9.9 Implications for higher education in Uganda**

As explained earlier in section 9.4 an integrated SIMS should be designed for the intended environment. In addition to strategies arising from the above discussion, the following strategies are recommended:

#### **Recommendations**

##### **a) Further Action to be taken**

- With reference to the system needs and requirements discussed in Chapter Seven, a logical and physical analysis and design should be carried out, employing a phased modular approach to enable the proper implementation of a framework for an integrated SIMS.

- At the institutional level, a SIMS should be developed.
- Standard forms should be designed for the capture of student information at all levels.
- The coordinating agency could develop software to allocate a national identification number.
- Since safeguarding student information is important in an integrated SIMS, a security system is required.

#### **b) Further research**

- This study was limited to the education sector in Uganda. Further research to analyse the state of identification systems in the whole country is required. Other sectors should be studied to establish an information management system for the country.
- A study on data warehousing to enable provision of information at information or data centres or bureaux is required.
- A records classification system, for education information in general and student information in particular, should be investigated.
- A continuous review, based on appropriate indicators, needs to be done to evaluate the effectiveness of an integrated SIMS in Uganda.

In this thesis, the researcher has attempted to lay the groundwork for the establishment of such a system in Uganda and to suggest the directions which future research could take. It is hoped that the research undertaken will prove to be not only of theoretical but also of practical value.

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