

THE NETHERLANDS PROGRAMME FOR THE INSTITUTIONAL STRENGTHENING OF POST-
SECONDARY EDUCATION AND TRAINING CAPACITY (NPT)



BUILDING A SUSTAINABLE ICT TRAINING CAPACITY IN THE
PUBLIC UNIVERSITIES IN UGANDA

FINAL PROJECT REPORT

Period: 1st July 2004 – 30th June 2008

Makerere University
Mbarara University of Science and Technology
Kyambogo University
Gulu University
Uganda

University of Groningen
Radboud University Nijmegen
Hanze University of Professional Education

The Netherlands

List of Acronyms

BIT	Bachelor of Information Technology
CIT	Faculty of Computing and Information Technology
CE	Computer Engineering
CS	Computer Science
DCSE	Data Communications and Software Engineering
GIS	Geographical Information System
GU	Gulu University
ICDL	International Computer Driving Licence
ICT	Information & Communication Technology
IPR	ICT Policy and Regulation
IS	Information Systems
IT	Information Technology
KYU	Kyambogo University
LTE	Long Term Expert
MAK	Makerere University
MUST	Mbarara University of Science and Technology
NL	The Netherlands
RUG	University of Groningen
RUN	Radboud University Nijmegen
SE	Software Engineering
UG	Uganda

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Project Information

1. **Location**
Four Public Universities in Uganda
2. **Project Name**
Building a Sustainable ICT Training Capacity in the Public Universities in Uganda
3. **Project number**
Uganda: UGA/068
Netherlands: NPT/UG/032
Grant number: CF1676
4. **Participating institutions**
Uganda:
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Mbarara University of Science and Technology
Kyambogo University
Gulu University

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5. **Project Period:** 1st July 2004 – 30th June 2008, budgetary extension until 31st July 2008
6. **Reporting Period:** 1st July 2004 – 30th June 2008
7. **Amount available from NPT programme:** EUR 3,339,816

1.0 Project Overview

1.1 Introduction

The Project, 'Building a Sustainable ICT Training Capacity in the Public Universities in Uganda' was based in Uganda under the NPT Programme. The lead institution in the South was Makerere University, Faculty of Computing and Information Technology (further called Party A) and the lead institution in the North was the University of Groningen (further called Party B). The other project partners were Mbarara University of Science and Technology (MUST); Gulu University; Kyambogo University in the south and; Radboud University Nijmegen and Hanze University of Professional Education in the North.

The project's aim was to address Information and Communication Technology (ICT) capacity building in the Public Universities in Uganda, namely Makerere University, Kyambogo University, Mbarara University of Science and Technology, and Gulu University. The target group was staff and students in the above institutions and mid-career ICT professionals. The main activities required expertise from the Netherlands, for support in Curriculum Development and Implementation, in development of research capacity and to advise on the establishment of a Centre of Excellence for ICT Training and Research.

The project was implemented in a period of four (4) years, it commenced on 1st July 2004. The maximum amount of the grant from Nuffic was 3,339,816 Euros and the period of the grant was from 1st July 2004 to 30th June 2008. The Southern Institutions contributed approximately 660,184 Euros in form of financial and material input such as payment of taxes e.g. Value Added Tax (VAT); complementary funding and equipment; physical infrastructure; and human resource. Thus at the end of the four years, the project was worth at least 4,000,000 Euros.

As a result of the success of this project, a second phase project on '*Strengthening ICT Training and Research Capacity in the Four Public Universities in Uganda*' commenced on 1st June 2007. The overall objective of the Project is to strengthen the capacity of Makerere University Faculty of Computing and IT, the Institute of Computer Science at Mbarara University of Science and Technology, the Departments of Computer Science at Kyambogo and Gulu Universities to develop, implement and manage relevant educational and research programmes for poverty alleviation, rural and economic development. The transition of first phase to phase two of the project is successfully progressing and the cooperation between the south and north institutions is in good spirit.

1.2 Overall Objectives of the Project

The overall objectives of the project were:

- a. To build a sustainable ICT human resource capacity at the four Public Universities in Uganda (Makerere University, Kyambogo University, Mbarara University of Science and Technology and Gulu University);
- b. To create a Centre of Excellence that shall be nationally responsible for the continuous training of ICT human resources for the whole country;
- c. To enhance (online) education in ICT programmes by building capacity in (local) content development.

1.3 Specific Objectives of the Project

The specific objectives of the project were:

- a. To strengthen existing educational programmes, and develop and implement new curricula for Bachelor's and Master's Programmes;
- b. To build ICT human resource capacity through staff development programmes (M.Sc. and Ph.D.);
- c. To strengthen a joint (for all Public Universities) research programme;
- d. To accomplish and adopt ICT Policy and Master Plans for Kyambogo and Gulu Universities, and strengthen network systems and ICT infrastructure;
- e. To promote gender-balance in both the number of academic staff as in the number of students and to contribute to the Uganda government's plans to increase the number of women participating in science;
- f. To strengthen relations and collaboration between the ICT academic units of the four Public Universities.

1.4 Project Coordination Committee, Uganda

For effective project coordination, monitoring and peer review, a project coordination committee comprising of the Overall Coordinator / Project Leader as Chairperson, the Dean Makerere University Faculty of Computing and IT (Prof. Venansius Baryamureeba); the Dutch Long Term Expert (Dr. Patrick Ogao) from 1st July 2005 until 30th June 2007; the representative of Makerere University, Ag. Deputy Dean in charge of Graduate Studies and Research (Dr. Ddembe Williams, Project sub-coordinator); the representative of Kyambogo University, Ag. Head Department of Computer Science (Mr. Henry Matovu, Project sub-coordinator); the representative of Mbarara University of Science and Technology, Ag. Director Institute of Computer Science (Ms. Theodora Mwebesa Twongyirwe, Project sub-coordinator); and the representative of Gulu University, Ag. Head Department of Computer Science (Mr. Nimrod Chris Mafabi, Project sub-coordinator) were put in place.

Makerere University Faculty of Computing and Information Technology provided secretariat for the Project. The Faculty's Accountant (Ms. Consolate Komugisha, Financial Officer) who handled project funds was always in attendance. Dora Bampangana, Administrative Assistant in Makerere University Faculty of Computing and IT provided support to the project as a Project Assistant. Under this committee monthly meetings were held in all the four Public Universities on a rotational basis and the host university was advised to invite a maximum of two members of top management and one academic staff member to the Project Coordination Committee Meeting when it was being held at that particular University.

1.5 Project Coordination Committee, The Netherlands

The Board of the University of Groningen, which consists of the President (Dr. Simon Kuipers), Rector (Prof. Dr. Frans Zwarts), and the Vice-President Prof. Koos Duppen, conferred the responsibility of the project's activities on the Academic Supervisor, Prof John Nerbonne. The Academic Supervisor was responsible for the overall coordination, progress and quality of the project, while the daily coordination of individual project activities lied with the participating institutions responsible for the respective project activities.

The Academic Supervisor worked closely with the Dutch consortium representatives from the three Universities: Prof. Renardel de Lavalette (RUG); Prof. Dr. Erik Proper (RUN), Drs. Robert Janz (RUG Computing Centre) and Ing. Willem Benjaminse (HHG). The Office for International Relations RUG provided support through the Project Coordinator, Mr Erik Haarbrink, assisted by Ms. Marieke Farchi. The Dutch Project Team advised on the implementation and activities and was chaired by the Academic Supervisor. The Project Team received assistance

for coordination of all day-to-day project affairs from the Office for International Relations of RUG. The Project Coordinator took responsibility for regular liaison between the Ugandan and Dutch partners. The Office for International Relations coordinated all project administrative (incl. financial) matters for the Project Team, and acted as the main liaison between the Dutch side of the project and Nuffic/DGIS.

Table 1: Organizational Diagram of the Consortium

Academic Supervisor, Prof. John Nerbonne			
Prof. Renardel de Lavalette (RUG)	Prof. Dr. Erik Proper (RUN)	Drs. Robert Janz (RUG Computing Centre)	Ing. Willem Benjaminse (HHG)
Project Coordination & Support by Office for International Relations RUG			

1.6 Executive Summary

All the project activities and objectives were completed except for the continuing 5 M.Sc students and 5 PhD students. The first PhD student, Mr. John Ngubiri graduated on 15th September 2008 and Ms. Nabukenya will be defending in February 2009. The remaining PhD students will all complete before June 2009. The MSc students shall complete by 31st December 2008. The table below shows the summary of level of achievement of the specific objectives of the project since the project started on 1st July 2004.

Table 2: Summary of Achievements [1st July 2004- 30th June 2008]

CS –Computer Science, IS – Information Systems, IT –Information Technology, SE- Software Engineering, DCSE – Data Communications and Software Engineering, CE- Computer Engineering, IPR - ICT Policy and Regulation

SN	Specific Objective	Summary of Achievement
1	To strengthen existing educational programmes, and develop and implement new curricula for Bachelor's and Master's Programmes	<ul style="list-style-type: none"> Programmes below were revised/designed and implemented <p>Makerere University:</p> <ul style="list-style-type: none"> PhD in CS, PhD in IS, PhD in IT, PhD in SE. M.Sc.CS, M.Sc. IS, M.IT, M.Sc. DCSE. PGD.CS, PGD. IS, PGD. IT, PGD.DCSE, PGD. IPR. B.IT, B.Sc. CS, Diploma in CS and IT <p>MUST:</p> <ul style="list-style-type: none"> B.IT <p>Gulu University:</p> <ul style="list-style-type: none"> B.Sc. CS, B.IT, Diploma in CS. <p>Kyambogo University:</p> <ul style="list-style-type: none"> Existing programmes strengthened <ul style="list-style-type: none"> Also existing and new programmes in all the four Universities were supported with Teaching and Research Dutch Expert missions.

2	To build ICT human resource capacity through staff development programmes (MSc and PhD)	<p><u>Makerere University:</u></p> <ul style="list-style-type: none"> ○ 1 PhD enrolled in NL completed, 4 more ongoing expected to complete in 2009; 3 M.Sc. in NL completed; 1 M.Sc in NL finalising; 5 M.Sc. in UG completed; 2 Technical staff completed 3 weeks training in NL. <p><u>MUST:</u></p> <ul style="list-style-type: none"> ○ 4 M.Sc. in NL completed; 5 M.Sc. in UG Completed; 2 Technical staff completed 3 weeks training in NL. <p><u>Gulu University:</u></p> <ul style="list-style-type: none"> ○ 1 PhD student enrolled in NL is ongoing; 4 M.Sc. in NL completed; 2 M.Sc. in UG completed; 3 M.Sc. in UG in final stages; 2 Technical staff completed 3 weeks training in NL. <p><u>Kyambogo University:</u></p> <ul style="list-style-type: none"> ○ 4 M.Sc. in NL completed; 1 M.Sc. in UG finalising; 2 Technical staff completed 3 weeks training in NL.
3	To strengthen a joint (for all Public Universities) research programme	<ul style="list-style-type: none"> • PhD students registered at Makerere University had research visits of 2 months to the NL in 2006, 7 in 2007 & 1 in 2008: <ul style="list-style-type: none"> ○ 5 Makerere University staff in 2006, 4 in 2007 ○ 1 Kyambogo member of staff in 2006 ; 1 in 2007 ○ 1 Gulu member of staff in 2006 ; 1 in 2007, 1 in 2008 ○ 1 MUST staff in 2006; 1 in 2007 • Annual International Conference for Computing and ICT Research in place; this 4 days' conference starts on Sunday of the first week of August of every year beginning with August 2005 www.iccir.cit.ac.ug. • International Journal of Computing and ICT Research (IJCIR) in place (www.ijcir.org) ISSN 1818-1139' (print), ISSN: 1966-1065 (online). • PhD students enrolled at Makerere University in the Faculty of Computing and IT are from 4 public Universities and other institutions and are currently undertaking research activities. • PhD holders are undertaking joint research/ supervision across universities. • Several publications both in journals and books in place.
4	To accomplish and adopt ICT Policy and Master Plans for Kyambogo and Gulu Universities, and strengthen network systems and ICT infrastructure	<ul style="list-style-type: none"> • All the four public universities have ICT Policies and master plans; • All planned computing equipment acquired: Each University has a 40 computer lab for students, 5 computers for research staff, 2 photocopiers and 2 heavy duty printers among others; The Centre of Excellence at Makerere University acquired a Clustered Server System with 20 Personal Computers to enable access to the system.

5	To promote gender-balance in both the number of academic staff as in the number of students and to contribute to the Uganda government's plans to increase the number of women participating in science	<ul style="list-style-type: none"> • Out of the 38 planned positions for members of staff to train both on PhD and MSc programmes from the four Public Universities on the project, 17 (approx. 47.7%) were filled by female members of staff. • Female enrolment was improved on all computing academic programmes at the four public universities.
6	To strengthen relations and collaboration between the ICT academic units of the four Public Universities	<ul style="list-style-type: none"> • Joint research, joint student supervision, staff exchange, student exchange external examining, organizing joint conferences and workshops, quality assurance (peer reviews) were conducted; • Resource sharing through use of Blackboard software in all the 4 public universities is in steady progress; more shared applications and resources were put on the Clustered Server System that was installed at the Centre of Excellence at Makerere University. • Joint subscription to International Journal of Computing and ICT Research (IJCIR) has been set up • 34 Joint monthly project coordination meetings took place since the project began.

2.0 Description of the Project Activities [1st July 2004 - 30th June 2008]

2.1 Component A: Education Development

2.1.1 A1.1: Curriculum Development Workshops in 2004 and 2005

From 16th to 22nd October 2004, a Curriculum Development Workshop was held at Makerere University. Five (5) experts from The Netherlands participated at this workshop: Mr Van der Lei, Hanze University of Professional Education; Drs. Harm Bakker, University of Groningen; Prof. Erik Proper, Radboud University Nijmegen; Dr. Martijn Oostdijk, Radboud University Nijmegen and; Dr. Rien Dam, University of Groningen. Participants from Uganda were mainly from the four (4) Public Universities in Uganda: Makerere University, Mbarara University of Science and Technology, Gulu University and Kyambogo University; and from private Universities; Kampala International University, Nkumba University, Uganda Christian University Mukono; representatives from IT and Telecommunications Companies; National Council for Higher Education; National Curriculum Development Centre; Ministry of Finance and Economic Planning among others.

During the first (half) day of the conference the project 'Building a Sustainable ICT Training Capacity in the Public Universities in Uganda' was officially launched. Ms. Wendy Engelberts the Second Secretary for Economic and Cultural Affairs and Mr. George Kalibbala the Education Advisor at the Royal Netherlands Embassy in Kampala represented Her Excellency Joke Brandt the then Ambassador of Embassy of the Kingdom of Netherlands in Uganda. Top management officials from the 4 Public Universities (the Vice Chancellors, Deans and Directors) and from other private universities in Uganda also officiated at the function.

The deliberations at the workshop held in 2004 resulted into:

- Recommendations for the general outline of the new curriculum for the Master of Information Technology Programme;
- Guidelines / framework on how to develop a market driven curriculum

After the workshop, curricula for four (4) Graduate Programmes at Makerere University were developed and finalised i.e. Master of Information Technology (MIT), Postgraduate Diploma in Information Technology (PGDIT), Master of Science in Data Communications and Software Engineering (M.Sc. DCSE) and Postgraduate Diploma in Data Communications and Software Engineering (PGDCSE). These courses were designed to suit the growing ICT needs of the IT market not only in Uganda but also internationally.

In 2005, the curriculum development activity was carried out with special focus on Gulu University, Kyambogo University and Mbarara University of Science and Technology. The main purpose was to aid these Universities in the development of their undergraduate courses in IT and Computer Science related courses. Two experts from Hanze University of Professional Education i.e. Mr. Remko van der Lei and Ms. Jose Eggink facilitated the second Curriculum Development workshops in the four Public Universities in Uganda in April 2005 as follows:

First workshop phase was held at Kyambogo University from 4th to 8th April 2005 whereas the second phase was held at MUST from 11th to 15th April 2005. All the four Public Universities including Makerere University attended both phases of the workshop.

One of the main outcomes of the 2005 Curriculum Development Workshop was the development of the curriculum for the Bachelor of Information Technology (BIT) for Mbarara University of Science and Technology and finalizing of

the Bachelor of Science in Computer Science at Gulu University respectively. The BIT programme at MUST commenced in October 2006. The B.Sc. in Computer Science at Gulu University commenced in September 2005. At Kyambogo University the existing programmes were further strengthened. At Makerere University, various programmes at different levels i.e. PhD, M.Sc and Postgraduate Diploma were approved and are all running as follows:

Doctor of Philosophy Programmes [one year of coursework and 2 years of research]

- PhD in Computer Science,
- PhD in Information Technology
- PhD in Information Systems
- PhD in Software Engineering

Master/Postgraduate Diploma Programmes

- Master in Information Technology
- Postgraduate Diploma in Information Technology
- MSc in Data Communications & Software Engineering
- Postgraduate Diploma in Data Communications and Software Engineering

The existing MSc in Computer Science programme was revised and transformed into:

- MSc in Computer Science
- Postgraduate Diploma in Computer Science
- MSc in Information Systems
- Postgraduate Diploma in Information Systems

Undergraduate Programmes

- Bachelor of Information Technology
- Bachelor of Science in Computer Science was revised
- Diploma in Computer Science was changed into Diploma in Computer Science and IT

2.1.2 A1.2: Educational Needs Assessment

In 2004, Makerere University Contracts Committee carried out the procedure of selecting the consultant to provide consultancy services on the ICT Educational Needs Assessment in the four public Universities. Out of the three companies that responded to the call for proposals i.e. ICT Consults Ltd, Consultants Ltd, and A & A Create; ICT Consults Ltd merged winner and was awarded the contract. The terms of reference for the consultancy were as follows:

- To collect the views of continuing and prospective students of higher institutions of learning on ICT in Education.
- To carry out a market study and identify the hindering factors that are responsible for constraining the full achievement of ICT usage in Uganda, identifying transitional constraints and propose a strategy and plan for their resolution.
- To find out on the status of the computing facilities, supportive services and the general infrastructure at each of the 4 public universities.
- To carry out an assessment of the labour market needs for ICT professionals in Uganda, find out what happens to ICT graduates after they have acquired their education and whether the labour market is receiving the right expertise and skilled persons as expected.
- To determine whether the Universities have got competent adequately trained human resources (researchers, lecturers, trainers and supportive staff), with special attention to gender balance.

- To assess the quality of ICT training for private sector in comparison with the ICT trainings of the four public universities as well as the government
- To assess the collaborative capacity among universities in Uganda (Both private and public).
- To determine the level of Digital Divide within the 4 public universities. Carry out a survey and find out whether ICT utilisation equally cuts across all the 4 public universities.
- To assess the need for community outreach programmes and whether there are any ongoing community sensitisation programmes available in any of the public universities
- To find out the extent to which gender balance in education and employment has been addressed in the 4 public universities as well as the private universities.
- To determine and propose an educational needs plan for the 4 universities and determined the required implementation arrangements for such a plan.
- To determine the extent to which the existing and proposed ICT policies of the 4 public universities enable ICT education delivery and human resource development.
- To find out how e-learning is facilitated in Uganda and how training of developers of electronic learning materials can be carried out. Find out about the status e-learning at the four public universities and also at a few selected private universities in Uganda.

The Project Coordination Committee at its 6th Meeting held on 17th December 2004 at Kyambogo University considered and approved the Inception Report on ICT Educational Needs Assessment presented by ICT Consults Ltd. [See appendix 1]

On 23rd of February 2005, a half day workshop on, 'Educational Needs Assessment in the Public and Private Sectors in Uganda' was held on 23rd February 2005 by ICT Consults Ltd. Key stakeholders from the Public and Private Sector participated at this workshop where ICT Consults Ltd presented a report of their findings. The final report of the ICT Educational Needs Assessment was received on the 26th April 2005 from ICT Consults Ltd. The recommendations in the report were made in reference to the following areas raised in the terms of reference: ICT Human Resource in Universities; Adequacy of ICT Education Facilities in the Universities; Collaborative Capacity Among Universities; E-Learning Implementation in Institutions of Higher Learning in Uganda; Digital Divide Among Public Universities; ICT Students' Needs; Community Outreach; Labor Market Demands for ICT Professionals; ICT Policy; and Curricula Issues. [Details are in appendix 2].

The Consultancy contract cost EUR 13,018.51 (Thirteen thousand eighteen and fifty one cent Euros) excluding Value Added Tax (VAT).

2.1.3 A1.3: Joint Yearly Sensitisation (locally) Workshops

ICT Stakeholders' Workshop

In the year 2007, an ICT Stakeholders' Workshop was held from 3rd – 4th May 2007 at Ridar Hotel Seeta, Mukono. This workshop was intended to create a dialogue between Public universities and other ICT stakeholders so as to build consensus on role and opportunities of Universities in an ICT-led economic agenda. It was also intended to devise strategies for continuously involving the Government of Uganda and the Private sector in ICT activities at Universities and vice-versa.

This workshop attracted participants from various private – public sectors in Uganda. Participants were from different Institutions of the Academia, Public and Private Sectors: Uganda Communications Commission; ICT Parliamentary Committee; Ministry of Education and Sports; Makerere University; Mbarara University of Science and Technology; Kyambogo University; Gulu University; Busitema University; and Uganda Martyrs University. In total six reports on

status of ICT Education one from a private university and five from public Universities; and 3 papers on the application and relevance of ICT in national development were presented. [Workshop proceedings are attached as appendix 3]

2.1.4 A2.1: The Long Tem Expert (LTE)

Dr. Patrick Ogao served on the project as a Long Term Expert for a period of two years (July 2005 – 30th June 2007).

2.1.4.1 Brief Background on the Selection Process of the Long Term Expert

The Project Coordination Committee at its 5th meeting held at Makerere University on 15th November 2004 unanimously refused the proposed Long-Term Expert by University of Groningen, Mr. Henk Hindriks, on the ground that he had no enough experience in research and curriculum development and he did not possess the minimum academic qualifications to lecture at a public University in Uganda. The Overall Coordinator / Project Leader in Uganda visited the University of Groningen from 9th December 2004 to 11th December 2004 to further discuss filling the LTE position and during this visit the following was agreed upon:

- That the LTE position would be filled through an open procedure and should be done as soon as possible;
- That Party A and Party B jointly select a new and appropriate candidate for the LTE position from the shortlist drawn by Party B;
- That the LTE should possess a PhD degree in Computer Science or a related field, a minimum of three publications as well as management and communication skills.
- That the LTE would participate in project management (25%); Research (50%); Teaching (20%); and other activities such as curriculum development (5%).
- On 11th May 2005 while in NL, Prof. Venansius Baryamureeba, Overall Coordinator / Project Leader, participated in the selection process of the LTE together with other members of the selection panel which comprised of Prof. Dr. Koos Duppen – The General Director of the Computing Centre University of Groningen, Drs. Robert Janz – Technical Director of the Computing Centre University of Groningen, Ms. Drs Madeleine Gardeur – Director of the Office for International Relations University of Groningen and Ms. Annette Nanninga – Personnel Officer University of Groningen. Out of all the candidates for the post of LTE, three (3) were short listed and Dr. Patrick Ogao was selected for the position of LTE.
- In preparation for his two (2) year long-term expert support in Uganda, Dr. Ogao visited Uganda for an orientation of 10 days (19th - 29th May 2005). During this visit, Dr. Ogao had meetings with Ph.D. students training in Makerere University together with Prof. Dr. Erik Proper (Radboud University Nijmegen) and Prof. Dr. Gerard R. Renardel de Lavalette (University of Groningen) who had come to Uganda on a mission of selecting M.Sc. candidates to train in the Netherlands for the year 2005.
- Dr. Ogao arrived in Uganda on the 23rd of July 2005 together with his family comprising of a wife and 2 children. His main duties which he started executing in July as highlighted in the LTE Terms of Reference are:
 - Research development including supervision of PhD students (50%)
 - Teaching on both undergraduate and postgraduate programmes (20%)
 - Project management (20%)
 - Other activities such as curriculum development (5%)

Research Development

Since July 2005 when he started his service on the project, he supervised PhD students and M.Sc. students of which 14 graduated with M.Sc degrees (6 in February 2007 and 8 in January 2008).

Teaching Activities

At Makerere University, the LTE taught: Trends in Information Systems; and Research project management on the Ph.D. programme and; Geographical Information Systems; and Image processing on the M.Sc in Information Systems programme.

At Mbarara University of Science and Technology, the LTE gave input to the supervision of 3rd year undergraduate students on the Bachelor of Computer Science, and specifically to projects falling within the realms of computer graphics. The LTE also conducted a Quality Assurance Workshop on 23rd June 2006.

At Kyambogo University, the LTE gave a special lecture in Information Visualization on the Bachelor of Information Technology and Computing programme.

Important to note is that due to political / security instability in Gulu District, the LTE was not able to execute teaching duties at Gulu University.

Project Management Activities:

The LTE was involved in the day to day coordination of the project. He also coordinated the Ugandan PhD staff / research visits to the Netherlands (Activity C.4) under which by 30th June 2007, four (4) staff members had visited NL (3 from Makerere University and 1 from Kyambogo University).

2.1.5 A2.2: Expert Mission on ICDL

During the 2nd Project Coordinators' meeting held on 28th August 2004 at Makerere University, it was noted that the Institutions in the Netherlands were to provide expertise that was not locally available. It was further noted that Makerere University was both a training and certification centre for the International Computer Driving License (ICDL). As a result there was local expertise that could train trainers of trainers in ICDL for all the public universities.

During its 4th meeting held on 17th October 2004 in Makerere University, the Project Coordination Committee came to an agreement that since Makerere University Faculty of Computing and Information Technology was both a training and certification centre for the International Computer Driving License (ICDL) it would provide local expertise that could train trainers of trainers in ICDL for Kyambogo University, Gulu University and MUST.

The universities came up with programmes/ timetables on how this activity should be conducted. Makerere University was flexible on the training venue, whether to be done at the individual Universities or at Makerere University itself and the Universities chose to have the training from their respective premises. The maximum period of time allocated for this training was agreed not to exceed two weeks (approximately 70 hours of training). The training was conducted as follows:

- At Gulu University the training took place from 8th – 19th August 2005 and thirty six (36) members of staff trained in ICDL.
- At Kyambogo University the training took place from 15th – 26th August 2005 and forty (40) members of staff undertook the ICDL training.
- At MUST the training took place from 4th – 14th October 2005 and forty three (43) members of staff were trained in ICDL.

2.1.6 A2.3: Expert Support for In-Service Training Programmes

This activity took place in 2005 after receiving the report on *ICT Educational Needs Assessment*, which clearly stipulated the kind of support service training programmes would provide. This activity was intended to be a follow up of Curriculum Development workshops facilitated by Hanze University. The main objective was to strengthen relations with and participation (in curriculum development, execution and quality control) of trade and industry. The plan from NL was that this activity be executed by Drs. Remko van der Lei and Drs. José Eggink of Hanze University Groningen both of whom earlier on undertook related missions in October 2004 and April 2005. However, due to unavoidable circumstances on the side of one of the NL experts, this activity was re-scheduled to April 2006.

To this effect, a workshop on in-service training programme specific to curriculum development - on Relations with Trade and Industry was held at Makerere University from 3rd to 6th April 2006 by Drs. Remko van der Lei (Education Innovation Officer) and Drs. Kees van Ee (Education Officer – team ICT, Lecturer Financial Economics) both from Hanze University.

The four Public Universities benefited in the area of developing and implementing plans for linking University curricula with Trade and Industry. A total of nineteen (19) members of staff participated in the workshop as follows:

- 9 staff members from Makerere University;
- 5 staff members from MUST;
- 3 staff members from Gulu University;
- 2 staff members from Kyambogo University.

This mission was a follow up of a 'Curriculum Development and Course Design' workshop which was conducted for the four Public Universities during the period: 4th -15th April 2005 at Kyambogo University and Mbarara University of Science and Technology.

2.1.7 A2.4: Strengthening E-Learning Programmes

There were no experts missions in 2004 on strengthening e-learning capacity in the public universities in Uganda. The report from the Consultancy on ICT Educational Needs Assessment was to first provide baseline information for the Expert Missions on e-learning in 2005. Between the period 1st July 2004 and 31st December 2004, Makerere University had developed 25 e-learning courses on the B.Sc. in Computer Science and Bachelor of Information Technology with a plan to have all undergraduate courses online by December 2005. While in 2005 Makerere University was in need of experts from NL to validate the e-learning courses already developed, the other three public universities were seeking for e-learning experts to train their staff in e-learning content development since they had little prior knowledge in e-learning.

During the 16th Coordinators' meeting, the Ugandan side decided that it would be very practical for the staff to acquire a preliminary training in e-learning. It was also agreed that since Makerere University had members of staff who had conducted Training of Trainers modules in e-learning before, they should conduct a preliminary course to members of staff in MUST, Kyambogo University and Gulu University using some of the funds which remained on the ICDL Training Activity. The main purpose of this was that when the NL experts come, they should find these members of staff with some fundamental skills in e-learning. Members of staff who were trained were mainly those having a background of courses such as B.Sc. in Education, B.Sc. in Computer Science and other related fields so that they can be able to carry on the expertise as Trainers of Trainers after completion of the training.

Table 3: The 2005 E-learning Training Schedule

Training Period	Training Venue	Benefiting University	No. of Trainees
28 th Nov – 2 nd Dec 2005	Makerere University	Kyambogo University	20
28 th Nov – 2 nd Dec 2005	Makerere University	Gulu University	10
5 th – 9 th December 2005	MUST	MUST	10

The staff members who were trained from various departments of their respective Universities embarked on developing e-learning courses.

A Dutch expert mission that was supposed to take place in 2005, did not take place, this mission was executed in 2006. In January 2006, two NL experts: Dr. Jan Folkert Deinum & Ms. Eline Noorbergen from the University of Groningen conducted an e-learning training for staff members from MUST, Kyambogo University and Gulu University. This arrangement was agreed upon during the LTE visit to NL from 2nd -14th December 2005 when it was established that Dr. Jan Folkert Deinum and Mrs. Eline Noorbergen would come to Uganda to deliver an e-learning course on Content Development and Training in e-learning. The target group mainly consisted of staff from Gulu University, Kyambogo University and MUST. A total of nineteen (19) participants successfully completed the training as shown in the table below:

Table 4: The 2006 E-learning Training Schedule

Training Period	Training Venue	Benefiting University	No. of Trainees
23 rd – 27 th January 2006	Makerere University	Kyambogo University	6
23 rd – 27 th January 2006	Makerere University	Gulu University	7
23 rd – 27 th January 2006	Makerere University	MUST	6

2.1.8 A2.5: Teaching and Academic Support Missions

There were no teaching and academic support missions in 2004. Six (6) Teaching and Academic Support Missions from the Netherlands were planned for 2005. However, it proved difficult to match the experts to the required input. The Ugandan universities wished to have a list of all the experts, their field of interest and their availability from all three Dutch institutions, enabling them to choose the expert best suited to their needs. The Dutch institutions on the other hand found it hard, considering the size of their institutions and the great variety of expertise they offer, to make such a list without clear indications from the Ugandan side on which topics were preferred. The University of Groningen compiled a list of 10 possible experts for the mission and tentatively scheduled the visits for 2006.

Table 5: The List of Experts (and topics) Proposed by RUG for 2006

	Expert	Topics
1.	Dr. M. Biehl	Pattern Recognition, Neural networks, Modelling and Simulation
2.	Prof. Dieter Hammer	Software/System Architecture
3.	Dr. Michael Wilkinson	Computer Vision, Image Processing
4.	Prof. Gert Vegter	Computational Geometry, Applied Symbolic Computing
5.	Prof. Dr. Gerard Renardel	Discrete Mathematics, Algorithms, and Data Structures, Dynamic Logic
6.	Dr. Rien Smedinga	Object Oriented Programming/Design
7.	Drs. Jan Jongejan	Compiler Construction
8.	Prof. Dr. Jos Roerdink	Computer Graphics, Scientific Visualisation
9.	Drs. Sietse Achterop	Embedded Systems, Real Time Systems
10.	Elwin Kusters	Semantic Web, GIS, XML

The Hanze University for Professional Education indicated that they could not offer English taught courses as all their relevant programmes were only in Dutch. Radboud University Nijmegen was to submit their proposed list in early 2006.

In consideration of the developments above, the 21st Coordinators' meeting which took place in Makerere University on 24th March 2006, discussed issues on teaching and academic support missions. In conjunction with RUG counterparts, it was agreed that Makerere University conducts the Teaching Missions in Uganda instead of the Institutions in the Netherlands. Furthermore, in agreement with the Northern Institutions, this activity was finally adjusted in the revised work plan for 2006 as follows:

- i. Activity A2.5 should be undertaken by Makerere University staff and supported by the LTE during his two-year term of service.
- ii. The originally planned missions were substituted with the following activities:
 - Substitute Activity 1: Three (3) visits of NL Ph.D. supervisors to Uganda to discuss progress with candidates and co-supervisors in Uganda during fieldwork of the Ph.D students.
 - Substitute Activity 2: Five (5) research working visits where Makerere Ph.D. staff students visited NL institutions for exposure and supervision on ongoing research. This activity was completed in 2006.

[The above substitute activities are reported in detail in C3 and C4 respectively]

2.1.8.1 Makerere University and LTE Teaching Support to MUST, Kyambogo University and Gulu University

To implement the above agreement, during the 24th coordinators' meeting which was held in MUST on 30th June 2006, it was agreed that Makerere University would provide one staff member to MUST, Kyambogo University and Gulu University to teach four courses during semesters one and two of 2006/2007 academic year. MUST identified courses to teach and was given staff as follows:

Table 6: Teaching Support to MUST in 2006

Academic Year	Staff	Course Name Unit /Code
Semester 1 Academic Year 2006/2007	Mr. Martin Ngobye	<ul style="list-style-type: none"> • Compiler Construction: CSC 2106 • Introduction to Artificial Intelligence: CSC 3102
Semester 2 Academic Year 2006/2007	Mr. Martin Ngobye	<ul style="list-style-type: none"> • Distributed Computing: CSC 3209 • Ethical and Legal Issues in Computing: CSC 3207

By end of 2006, Gulu and Kyambogo Universities had not yet identified the courses where they needed to be supported. However the LTE continued to offer teaching support under Activity A2.1.

In addition, the three Universities: Kyambogo University, Gulu University and MUST were given Lecturers to supplement teaching on undergraduate courses in semester I 2007/2008 academic year as follows:

Table 7: Teaching Support to MUST, KYU, and GU in 2007

University	Staff Name	Course Code & Name
Kyambogo University	Mutungi Fredrick	IT113:Discrete Mathematical structures IT221:Information systems and design
	Mpogo Muyende Ronald	IT215:Data Structure and Algorithms IT313:Computer Graphics
	Mutyaba Robert B	IT311:Introduction to Graph Theory
Gulu University	Asaba Alberto	BCS 315: Computer Graphics BCS 313: User Interface BCS 212: Computer Programming
	Alunyu Andrew Egwar	BCS 216: Cryptology and Coding Theory BCS 212: Systems Programming BCS 313:User Interface Design
	Ashaba Anthony Arthur	BIT 216: Scripting Languages BIT 215: Electronic Media Systems & Multimedia BSC 315: Computer Graphics
MUST	Naturinda Hosea Makuru	BIT 2107: Electronic Media Systems & Multimedia BIT 1101: Web Site Development and Internet Technology CSC 3104: Networking CSC 1101: Computer Literacy
	Namirembe Esther	CSC 3101: Software Engineering BIT 2102: E-Commerce BIT 2104: Introduction to Operating Systems
	Wasubire Julius	BIT 2106: Event driven Programming

In 2008, MUST was again provided with teaching support for semester 2 of academic year 2007/2008 as shown in table below:

Table 8: Teaching Support to MUST in 2008

Staff Name	Course Code & Name
Fred Kaggwa	BCS 3209: Distributed Computing BCS 3207: Legal Ethics BIT 2204: Systems Security BIT 1203: Business Applications Programming
Abasi Shafiq	BCS 3210: User Interface Design BCS 2207: Computer Architecture 2 BIT 1201: Systems Administration

2.1.9 A2.6: To Develop A Policy for Internships

This activity was facilitated by curriculum development workshops that were held in 2004 and 2005 especially under relations of the four universities and the trade & industry sector. The Uganda National Council for Higher Education continues to work with the four Public Universities on this issue. See activity A1.1 and A2.3 for further details.

2.1.10 A2.7: Organising an International Conference on ICT in Education and Attending Other Conferences

Since August 2005, in the month of August of every year, Makerere University Faculty of Computing and Information Technology hosts an annual international conference on computing and ICT research under the following 7 tracks: computer science, computer engineering, software engineering, information systems, information technology, Data communications and computer networks and ICT for sustainable development. The accepted papers are published as a book under series 'Special Topics in Computing and ICT Research'. The outstanding papers from each track are also published as a special issue in the 'International Journal of Computing and ICT Research. [More details on www.iccir.cit.ac.ug]

2.2 Component B: Staff Development (Ph.D. and M.Sc. Programmes, Short Training)

2.2.1 B1: 6 PhD Programmes in Computer Science & Information Technology

In 2004, 6 candidates were selected to pursue PhD in the Netherlands. They have worked on their research throughout the project period and one John Ngubiri was able to complete his PhD. Below is a table which presents the status of all the candidates.

Table 9: Status of the Training of Ph.D. Students

No.	Name	Sex	Home Institution	Training Institution	Supervisor in NL	Supervisor in UG	Training Status
1	John Ngubiri	M	MAK	RUN	Prof. dr. Mario van Vliet	Prof. V. Baryamureeba	Defended thesis & passed on 15 th September 2008
2	Benjamin Kanagwa*	M	MAK	RUN	Prof Theo van der Weide	Dr. Ezra K. Mugisa	Final Defense of thesis expected in April 2009
3	Josephine Nabukenya	F	MAK	RUN	Prof.dr.H.A.(Erik) Proper	Prof. V. Baryamureeba	Defense of thesis scheduled on 3 March 2009
4	Geoffrey Andogah	M	GU	RUG	Prof. Dr. Ir. J. Nerbonne, Prof. Gosse Bouma and Dr. Elwin Koster	Prof. V. Baryamureeba	Final Defence of thesis expected in May / June 2009
5	Julianne Sansa Otim	F	MAK	RUG	Prof. Dr. J.M.van der Hulst and Dr. Arpad Szomoru	Dr. Tadeo Ssenyonga	Final Defence of thesis expected in September 2009
6	Florence Twesigye Tushabe	F	MAK	RUG	Ass. Prof. Micheal Wilkinson	Prof. V. Baryamureeba	Final Defence of thesis expected in October 2009

*Benjamin Kanagwa, originally pursuing PhD studies at Makerere University was switched with Ibrahim Kaliisa (originally pursuing PhD studies at RUN). This was due to the fact that Ibrahim was appointed by His Excellency the President of the Republic of Uganda for special service as a Special Assistant in charge of ICT. The importance of this assignment could not allow Ibrahim to travel to NL as often as required. It was thus agreed by UG and NL project partners that he should switch and be a Ugandan PhD student supervised by Dr. Ddembe Williams.

2.2.2 B2+B4: M.Sc Training in NL

In total 32 positions were available for MSc training both in NL and in Uganda in a proportional distribution of 16 per side and were all filled. Out of the 32 positions 16 were trained in NL and 16 in Uganda. In both categories, selection of candidates was done in 2004 and 2005.

Table 10: Distribution of the 32 M.Sc Training Positions in NL and in Uganda

Country of Study	Beneficiary University	Planned M.Sc. positions 2004-2008	Filled positions	Unfilled positions
Netherlands	Makerere University	4	4	0
Netherlands	Mbarara University of Science and Technology	4	4	0
Netherlands	Gulu University	4	4	0

Country of Study	Beneficiary University	Planned M.Sc. positions 2004-2008	Filled positions	Unfilled positions
Netherlands	Kyambogo University	4	4	0
Uganda	Makerere University	5	5	0
Uganda	Mbarara University of Science and Technology	5	5	0
Uganda	Gulu University	5	5	0
Uganda	Kyambogo University	1	1	0
Total		32	32	0

Out of the 16 positions available for NL, 7 candidates were selected and commenced their studies in 2004 where as 9 were selected and commenced studies in 2005. Details are contained in the tables 10 and 11 below:

Table 11: Status of the Staff Members who Started M.Sc Training in 2004

No.	Name	Sex	Training Programme	Home Institution	Training Institution	Status
1	John Kizito	M	MSc	MAK	RUG	Completed
2	Drake Mirembe	M	MSc	MAK	RUN	Completed
3	Richard Ssekibuule	M	MSc	MAK	RUN	Completed
4	John Businge	M	MSc	MUST	RUG	Completed
5	Proscovia Olango	F	MSc	GU	RUG	Completed
6	Beatrice Aguti	F	MSc	KYU	RUN	Completed
7	Doreen Tuheirwe	F	MSc	MAK	RUG	Finalising project from UG

Table 12: Status of the Staff Members who started M.Sc Training in 2005

No.	Name	Sex	Training Programme	Home Institution	Training Institution	Status
1	Regina Awor	F	MSc	KYU	RUN	Completed
2	Loy Muhwezi Abaine	F	MSc	KYU	RUN	Completed
3	Jimmy Omony	M	MSc	GU	RUG	Completed
4	Julius Kidubuka	M	MSc	GU	RUG	Not completed
5	Emmanuel Abunyang	M	MSc	GU	RUN	Completed
6	Martin Kavuma	M	MSc	MUST	RUN	Completed
7	Michael Kizito	M	MSc	MUST	RUN	Completed
8	Caesar Ogole	M	MSc	MUST	RUG	Completed
9	Moses Matovu*	M	MSc	KYU	RUG	Not yet completed

*Among the 9 candidates selected in 2005, one candidate turned down the offer and the vacancy was filled in 2006 by Moses Matovu.

2.2.3 B3+B5: M.Sc Training in Uganda

Out of the 16 positions that were allocated for training in Uganda, 7 were filled in 2004 and 9 were filled in 2005. Details follow in tables 12 and 13 below:

Table 13: Status of the Staff Members who Started M.Sc Training in 2004

No.	Name	Sex	Training Programme	Home Institution	Training Institution	Status
1	Rose Nakibuule	F	MSc	MAK	MAK	Completed
2	Agnes Nakakawa	F	MSc	MAK	MAK	Completed
3	Deborah Mudhali	F	MSc	MUST	MAK	Completed
4	Joyce Nakatumba	F	MSc	MUST	MAK	Completed
5	Joab Ezra Agaba	M	MSc	MAK	MAK	Completed
6	Emmanuel Mugabi	M	MSc	MUST	MAK	Completed
7	James Bogere	M	MSc	GU	MAK	In progress

Table 14: Status of Staff Members who Started M.Sc Training in 2005

No.	Name	Sex	Training Programme	Home Institution	Training Institution	Status
1	Felix Bwire	M	MSc	MAK	MAK	Completed
2	Ongaya Kizito	M	MSc	GU	MAK	Completed
3	Dorothy A. Habinka	F	MSc	MUST	MAK	Completed
4	Judith Nampijja Kaziro	F	MSc	KYU	MAK	Project Implementation stage
5	Godfrey Ahumuza	M	MSc	GU	MAK	Completed
6	Arthur A. Ashaba	M	MSc	GU	MAK	Project Implementation stage
7	Sylvia Nsungwa	F	MSc	GU	MAK	Project Implementation Stage
8	Cynthia Nakibuuka	F	MSc	MUST	MAK	Completed
9	Joanitha Nagujja Ntambi	F	MSc	MAK	MAK	Completed

2.2.3.1 Percentage of Female Enrolment on Study Programmes on the Project

Out of the 32 filled positions at master's level 14 (approx 43.8%) were filled by female members of staff which is above the 40% stipulated in the project Proposal by the University of Groningen as stipulated in the agreement.

Out of the 6 Ph.D. positions filled, 3 (50%) were filled by female members of staff, which is above the 40% stipulated in the project Proposal by the University of Groningen.

Out of the total 38 members of staff selected for training both on Ph.D. and M.Sc. programmes from the four Public Universities on the project, 17 (44.7%) are filled by female members of staff.

2.2.4 B6: Training in Special ICT Technical Support Areas in NL

In 2005, MUST, Gulu University and Kyambogo University had their staff involved in a tailor made course from the University of Groningen. The course was titled, 'Managing an Academic Network Infrastructure'. Makerere University gave priority to the other Public Universities in the year of 2005 and sent her trainees for the same course in 2006. All the eight planned (8) positions were filled in the year 2006.

Table 15: Special ICT Technical Support Training in NL

	Name	University	Training Period
1	Mr. Emmanuel Fraide	MUST	22 nd May-10 th June 2005
2	Ms. Hellen Bagyenda	MUST	22 nd May-10 th June 2005
3	Ms. Lilliane Ndagire	KYU	22 nd May-10 th June 2005
4	Mr. Andrew Bwogi	KYU	22 nd May-10 th June 2005
5	Mr. Andrew Ayella	GU	25 th May-19 th June 2006
6	Mr. Philip Kato	MAK	25 th May-19 th June 2006
7	Ms. Rose Nakibuule	MAK	25 th May-19 th June 2006
8	Ms. Priscilla Clare Ayo*	GU	25 th May-17 th June 2007

*Mr. Eric Robert Opio (RIP) staff of Gulu University, who had completed the training on 19th June 2006, passed away in a motor accident on 4th September 2006. In replacement of his position, Ms. Priscilla Clare Ayo, technical staff of Gulu University was selected to train under the same activity in 2007.

2.3 Component C: Research Development

2.3.1 C1: Development of a Joint Research Programme

2.3.1.1 Annual International Conference on Computing and ICT Research

From the humble beginning in 2005 when the first conference was held, the conference has grown from strength to strength each year attracting more international and local participants than the previous ones (details are contained in A2.7). Throughout the project period, members of staff from the four public Universities were facilitated to attend and present papers at the various conferences both at national and international levels. Some of these papers resulted into publications as contained in the following section.

2.3.1.2 Publications by Staff from the Four Public Universities 2004

One of the outputs of this project was publications. Since 2004 the project supported staff and graduate students from the four public Universities to publish papers. In total 70 papers were published as follows 32 in Journals; 55 as

Book Chapters; and 34 as Conference Proceedings. [List of Staff Publications- Authors and Publication Titles is in appendix 4]. Also available on <http://cit.ac.ug/cit/research>.

2.3.1.3 International Journal of Computing and ICT Research

As part of research dissemination, Makerere University publishes a bi-annual journal, 'The International Journal of Computing and ICT Research (IJCIR)-ISSN 1818-1139(print), ISSN 1996-1065 (online). This journal has an international editorial board (www.ijcir.org) and publishes papers from across the globe in the area of computing and ICT research.

2.3.1.4 Research Seminars

During the project period, Makerere University Faculty of Computing and Information Technology conducted bi-monthly research seminars for staff from the public Universities. At these seminars scholars, visiting professors and researchers were invited to share their research experience and expertise with staff from the four Public Universities.

2.3.2 C2: National ICT Research Action Plan and Research Coordinator

At the 7th and 10th Coordinators' meetings in Uganda, the Overall Coordinator / Project Leader in Uganda in consensus with the Ugandan coordination team identified Dr. Ezra Kahwa Mugisa as the 'National ICT Research Coordinator'. Dr. Mugisa is a holder of a PhD in Computing with a major in Software Engineering and has immense managerial and research experience. His one (1) year assignment began on 1st July 2005 and ended on 30th June 2006.

During his appointment, the following activities were conducted:

- Linking up with the National Information Technology Authority – Uganda (NITA-U) on the national ICT Research Agenda;
- A Research Framework for the Public Universities in Uganda that fits into the National ICT Research Agenda was developed;
- He worked together with the four universities and the LTE to ensure that the developed research framework was adopted and implemented;
- Research projects that fall within the research framework were developed and Ph.D. students who are members of staff from the four Public Universities in Uganda were attached;
- Background lectures were delivered, strengthening members of staff working on the research projects that fall under the National Research Agenda

Dr. Ezra Mugisa, the National ICT Research Coordinator prepared and submitted handover report on 6th July 2006 highlighting issues such as achievements, setbacks and future prospects for ICT research in Uganda. In his handover report, it was recommended that the projects so far introduced, and those in the pipeline need to be consolidated with a view to getting meaningful research output out of them. That there was still need to significantly increase and improve research activity and output in Uganda.

2.3.3 C3: Research Working Visits: Dutch Experts to UG

Three missions were planned for 2006. Dr. Martijn Oostdijk and Professor Erik Proper came for a research mission in August 2006. The 2 experts stayed in Makerere University after the 2nd Annual International Conference on Sustainable ICT Capacity in Developing Countries – SREC'06 which took place from 6th - 9th August 2006. While they were in Uganda, they conducted workshops and presentations for graduate students. Graduate students from all the

four Public Universities greatly benefited from this mission in terms of research and supervision. Dr. Oostdijk left for NL on 11th August 2006 while Professor Proper left for NL on 19th August 2006.

The remaining one mission planned for 2006 was not implemented. In the revised work plan for 2007, 6 expert missions were planned for. However, only two took place in 2007 and the other was held in 2008 as follows:

- Dr. Elwin Koster, Mr. Geoffrey Andogah's Ph.D supervisor visited Uganda from 2nd May – 11th May 2007. His main visit activities were: to supervise and work with Mr. Andogah on publications; to give lectures on Semantic Web and Geographical Information Systems (GIS) to students in Makerere University (3rd and 4th May 2007), Kyambogo University (4th May 2007) and MUST (7th May 2007) and consulting with students and staff from the four Public Universities on GIS research, his area of expertise during the period: 3rd – 11th May 2007.
- Prof. Erik Proper visited UG from 27th – 29th August 2007. During this period, Prof. Proper gave research related lectures to staff and graduate students and was also able to give research guidance to graduate students at Makerere University.
- Prof. Thys van der Hulst, Ms. Julianne Sansa's Ph.D promoter had been scheduled to visit Uganda from 15th – 17th April 2007. However, it was cancelled due to the short visit duration. He was again scheduled for a visit to UG from 9th -18th July 2008. During his visit, he met with Ms. Sansa as well as her UG supervisor, Dr. Idris A. Rai, over her PhD research. He also met graduate students and staff over research issues and also gave 2 academic lectures / talks to students.

2.3.4 C4: Exposure Research Visits: UG Experts to NL

Under this activity, 16 missions were conducted (8 in 2006, 7 in 2007 and 1 in 2008). The purpose of these exposure visits was to initiate active research cooperation and to provide PhD students with expertise from academic staff in NL in their research. Many (joint) publications were produced. During the 21st Coordinators' meeting which was held on 24th March 2006 in Makerere University, 8 staff members from the four Public Universities were recommended for exposure research visits to NL.

In the planning for 2007 contingency funds were put to activity C4 such that the 8 PhD students registered in Uganda that had already been to the Netherlands were able to have another 2 months' visit in NL in order to work with NL PhD supervisors and be able to publish at least one research paper together. The table below provides the details of the 16 missions that were executed under C4 in 2006 and under substitute activity 2 of 2007.

Table 16: Details of 16 PhD Students Research Missions to NL

No.	Name	Home University	Local Supervisor	Host	Research Topic	Visit Period
1	Mr. Henry Matovu	Kyambogo	Dr. Ezra K. Mugisa & Dr. Patrick Ogao	Groningen (Prof. Gerard Renardel de Lavalette)	A Scalable Dynamical Climate Prediction Model Implemented on a Parallel Architecture	13/05/2006-14/07/ 2006
2	Benedict Oyo	Gulu	Dr. Ddembe Williams	Nijmegen University (Dr. Erik Barensen)	A Dynamic Simulation Model for Quality Assurance Decision Support in Higher Education	2/10/2006 – 2/12/2006
3	Rehema Baguma	Makerere	Dr. Patrick Ogao & Dr. Tom Wanyama	Nijmegen University (Dr. Patrick van Bommel)	A Web Design Framework for Improved e-Governance Accessibility	30/09/2006-30/11/2006

4	Jackson Muhirwe	Makerere	Prof. Venansius Baryamureeba	Groningen University (Prof. John Nerbonne)	Finite State Morphology for Kinyarwanda Language	14/10/2006-14/12/2006
5	Mariam Sensalire	Makerere	Dr. Patrick Ogao	Groningen University (Prof. Jos Roerdink)	A Taxonomy for Visualization Object Oriented Software	17/09/2006-17/10/2006
6	Ms. Agnes Namulindwa	Makerere	Dr. Jose Quenum	Centrum voor Wiskunde en Informatica (CWI) Prof. Farhad Arbab	A Component –based Development Environment for the Software Supermarket	13 th January - 14 th March 2006
7	Mr. Benjamin Kanagwa	Makerere	Assoc. Prof. J.Y.T Mugisha	Groningen University Prof D.K Hammer	Architecture for Design & Composition of Reusable Web Service Software	13 th January - 14 th March 2006
8	Ms. Theodora Mwebesa	MUST	Prof. Venansius Baryamureeba / Dr. Ddembe Williams	Nijmegen (Prof. Erik Proper)	A Collaborative Framework for Supporting Indigenous Knowledge Management	5 th May -26 th June 2006
9	Ms. Agnes Namulindwa	Makerere	Dr. Jose Quenum	Centrum voor Wiskunde en Informatica (CWI), Amsterdam Dr. Farhad Arbab	A Component –based Development Environment for the Software Supermarket	15 th Jan – 15 th March 2007
10	Mr. Jackson Muhirwe	Makerere	Prof. Venansius Baryamureeba	Groningen Dr. Gertjan van Noord	Finite State Morphology for Kinyarwanda Language	22 nd April - 22 nd June 2007
11	Mr. Benjamin Kanagwa	Makerere	Assoc. Prof. J.Y.T. Mugisa	Nijmegen Prof Theo van der Weide	Architecture for Design & Composition of Reusable Web Service Software	9 th May - 9 th July 2007
12	Mr. Henry Matovu	Kyambogo	Dr. Ezra K. Mugisa & Dr. Patrick Ogao	Groningen Prof. Renardel de Lavelette	A Scalable Dynamical Climate Prediction Model Implemented on a Parallel Architecture	20 th May - 13 th July 2007
13	Ms. Mariam Sensalire	Makerere	Dr. Patrick Ogao	Groningen (Prof. Jos Roerdink)	A Taxonomy for Visualization Object Oriented Software	14 th Sept – 12 th Dec 2007
14	Ms. Theodora Mwebesa	MUST	Prof. Venansius Baryamureeba / Dr. Ddembe Williams	Nijmegen (Prof. Erik Proper)	A Collaborative Framework for Supporting Indigenous Knowledge Management	10 th Oct - 10 th Dec 2007
15	Mr. Benedict Oyo	Gulu	Dr. Ddembe Williams	Nijmegen (Dr. Erik Barensen)	A Dynamic Simulation Model for Quality Assurance Decision Support in Higher Education	-1 st Oct – 30 th Nov 2007
16	Mr. Benedict Oyo*	Gulu	Dr. Ddembe Williams	Nijmegen (Dr. Erik Barensen)	A Dynamic Simulation Model for Quality Assurance Decision Support in Higher Education	6 th May - 6 th July 2008

* Ms. Rehema Baguma from Makerere University was planned to travel to RUN for her mission in October 2007 but instead opted to travel to the United Kingdom on another academic mission in relation to her PhD research work. This left one mission pending and was taken by Mr. Benedict Oyo in 2008.

2.3.5 Ugandan Senior Staff Visits to NL Institutions

Under this activity, Dr. Ddembe Williams, Ag. Deputy Dean (Graduate Studies and Research) and the Project Sub-Coordinator for Makerere University visited the Netherlands for a period of 8 days (11th – 19th October 2007) with the main objective of strengthening active research cooperation, and initiate joint scientific publications.

Details of his travel to RUN, RUG and Eindhoven University of Technology (TUE) are as follows:

Table17: Ugandan Senior Staff Activities in NL

	Date	Activity	Institution
1	11 th October 2007	Met Prof. Theo van der Weide and Ms. Nicole El Moustakim over research groups and Makerere University student supervision. Presented 2 papers on " <i>On Makerere and our research areas</i> " and " <i>On the role of systems dynamics in Understanding software development project better</i> ".	Radboud University Nijmegen
2	12 th October 2007	Met with Prof. Erik Proper on strengthening collaboration between UG and NL research groups. Presented a paper on " <i>Integrating Systems and conceptual modeling: as A Call for cross discipline Study and joint research</i> ".	Radboud University Nijmegen
3	15 th -16 th October 2007	Visited International Relations Office and had discussions with Prof. John Nerbonne on student research projects. Had discussions with the software engineering Groups on possible supervision.	University of Groningen
4	18 th October 2007	Had discussions with the Business Process Modeling Research Group	Eindhoven University of Technology

2.3.5 C5: Organising National Level Seminars on ICT

Throughout the project period, monthly / bi-monthly ICT research seminars were held at CIT where staff and students of the four public universities were invited to participate. At these seminars, researchers shared knowledge on the prevailing ICT endeavours within and outside the academia.

2.4 Component D: ICT Policy & Master Plans, Network Systems and Infrastructure / Hardware

2.4.1 D1: Support to 2-3 Universities in Finalising the ICT Policies and Master Plans

The call for the consultancy for finalizing the ICT Policy and Master Plan for Gulu University was advertised in March 2005 and from the companies that bid for the job, ICT Consults Ltd won the tender as per the evaluation and recommendation of the Makerere University Contracts Committee. Terms of reference for the consultancy were:

- To review the existing ICT Policies and master plans at the four public universities in Uganda
- To assess and advise on sensitization on ICT applications and end-user training in basic ICT skills
- To assess and advise on E-mail and Intranet communication infrastructure
- To assess and advise on the Internet connectivity and external communication
- To assess and advise on the access to digital library data journals
- Advise on the development of management information systems for university administration

- To assess the Campus network up-gradation and then also;
- To identify technical assistance activities and advise on staff technical training
- To outline the current ICT communication connections including the technologies employed and make an assessment of the state of the facilities
- To review the ICT development plans for the university and identify the crucial issues to be considered: reviewing the existing mechanism for ICT development.

On the 27th of June 2005, the Inception Report of this consultancy was submitted to the Overall Coordinator / Project Leader in Uganda [see appendix 5].

On the 22nd of July 2005 a one day Workshop on 'Awareness and Sensitization about the ICT Policy and Master Plan for Gulu University' where the Consultant together with Key staff members from Gulu University and other stakeholders participated was organised. After a validation workshop in August 2005, the final ICT Policy and Mater Plan were delivered.

The outputs of this consultancy were:

- Reviewed report on the existing ICT Policies and Master Plans of Gulu University, Kyambogo University and Mbarara University of Science and Technology.
- ICT policy and Master Plan in place for Gulu University.

Experts from the Netherlands – Drs. Robert Janz and Dr. Marc Petit worked on this Consultancy alongside the local Consultant [Final Reports for MUST, Gulu and Kyambogo Universities are in appendices **6A**, **6B**, and **6C** respectively].

2.4.2 D2: Network and Infrastructure Assessments and Upgrades

The advertisement for the consultancy was published in the local print media in 2004 and among the companies that bid for the job and went through the first evaluation stage was: Techno Brain Ltd, Venture Communications Ltd, ICT Consults Ltd, and Tri-Continental (Africa) Ltd. ICT Consults Ltd won the tender.

Terms of reference for the consultancy were as follows:

- To collect data from all the 4 universities about their network and what actions should be taken to remedy the weak points of the Network for the universities
- To carry out an assessment study and identify the hindering infrastructure factors that are responsible for constraining the full achievement of ICT usage in the Universities; and then propose a strategy and plan for their resolution.
- To assess whether the universities have got competent, adequate trained technical human resource to manage the ICT infrastructure available in the universities and whether Universities were using the rightly trained staff in the infrastructure.
- To investigate the developments in software and hardware that would be suitable for the universities
- To budget for the upgrades of equipment to cater for the increasing demand for Technology resources in the Least Developed Countries like Uganda
- To plan and lay a strategy for constantly monitoring the security aspects of the Network and the infrastructure, including both hardware and software.
- To study how the universities are currently maintaining the existing Network and infrastructure and advise on how well it can be better maintained and developed in a professional manner. Putting in mind that these facilities are accessed by students who may be having minimal knowledge in ICT and also the power costs and supply.
- To recommend the management tools to be used by the universities such as the network devices for ease of network management as the universities expand from time to time.

- To find out the extent to which the existing ICT Policies address the ICT infrastructure and network upgrades in the universities needed for Intranet and Internet connectivity and how well these policies can be improved.
- To lay a strategy (Plan) for an increased network access in order to cope with the increasing needs and to adopt new technologies like multimedia and e-learning technologies.
- To advise on how ICT infrastructure should be approached when buildings are upgraded / set up in the universities
- To give advice about the Network and ICT infrastructure professional development requirements.

The following recommendations were made in the final report compiled by both the local consultant and experts from NL:

- High capacity air conditioners are needed in the laboratories.
- More computers should be purchased to reduce the student to computer ratio at undergraduate to at least 1:5
- More switches and associated equipments/cabling system need to be availed equally if new laboratories are going to be setup
- Required network management software and tools be purchased to help improve the network performance
- Computers to a tune of 300 are required for the new computer laboratories needed to be setup to offer students better learning opportunities and reduce computer to student ratio to about 1:5
- More laptops and LCD projectors will be required for teaching and learning purpose.
- More UPS will be required for the new computers to be purchased.
- High power (centralized) UPS was not a popular choice due to maintenance costs and manpower that may be costly.
- As more computer laboratories with high computer density are thought of being setup, extra powerful servers are needed
- As the faculty introduces new courses and modern teaching techniques together with new software packages more powerful servers are required to accommodate the developments
- To improve the security within the network environment, the technical unit thinks of introducing Virtual LANs (VLANs).
- A system study should be carried out carefully so as to be able to capture all the needed fields to be considered in the application development.
- Training for the technical unit staff in network and network administration skills

On the 12th of May 2005, a Half-Day Workshop on ICT infrastructure/Network Assessment in the four Public Universities in Uganda was organized by the Consultant at which the company presented the consultancy report for stakeholder input. Dr. Marc Petit from NL assisted during the consultancy. The final report for the consultancy was successfully completed and handed over to the client through the UG Overall Coordinator / Project Leader. [See report in appendix 7].

2.4.3 D1-D2: Technical Upgrades; Formulation of ICT Policy; Sensitisation on ICT Applications and End-User Training in Basic ICT Skills

In 2006 workshops were organised to obtain sensitisation on ICT Applications and End User training in basic ICT skills at MUST, Kyambogo University and Gulu University. In general, it was training in ICDL focussing on awareness of management staff in the use of ICT in education. Below are details of how the activity took place.

MUST: On 28th August 2006, an ICT Sensitisation workshop was conducted for fifty two (52) staff members (teaching, administrative and management). From 3rd – 17th September 2006 Forty (40) staff (in senior management, teaching and administration) were also trained in ICDL.

Kyambogo University: A half day workshop for management staff was conducted on 12th December 2006. It was conducted by the University ICT committee staff. The main aim of this workshop was to sensitize the management staff about the use of ICT in education, the need of Information Systems at the University and the benefits of inter-connectivity in the University environment. From 13th – 21st December 2006, training in Basic IT skills based on the ICDL curriculum was conducted for twenty two (22) teaching and non teaching staff of Kyambogo University.

Gulu University: From 11th – 22nd December 2006, seventeen (17) staff of Gulu University were trained in ICDL (International Computer Driving License). Participants were senior management members of staff from Administration, Finance, Academic Registrar's office, Deans, Heads of Departments and Lecturers from all faculties. The objective of this training was to promote ICT awareness to the University Management and Administrative staff and to enable the participants to acquire IT skills and competencies.

The Purchase of 4 Laptops (one for each Public University Vice Chancellor)

As part of ICT awareness and sensitisation for key administrators of the four Public Universities in ICT skills, members agreed during the 19th coordinators' meeting which was held on 20th January 2006 in MUST that the project should purchase one laptop for each Vice Chancellor in the four Public Universities in Uganda as part of the activity on ICT sensitisation.

The Committee noted the need for integration of ICT in teaching, learning and administration at the four public Universities. Thus these laptops were expected to enable each Vice-Chancellor to use ICT as a tool in administration and management and teaching. These state of the art laptops were presented to the Vice Chancellors during a half-day workshop for Vice Chancellors and Academic Registrars of the four Public Universities on 27th April 2006 which was held at Makerere University Faculty of Computing and Information Technology.

Half-Day workshop for Vice Chancellors and Academic Registrars of the Four Public Universities in Uganda

During the 20th Coordinators' meeting which was held on 17th February 2006 in Kyambogo University, it was agreed that a half-day workshop for Vice Chancellors and Academic Registrars of the four Public Universities be conducted for the purpose of having all these key project stakeholders discuss the project report for the year 2005 and the work plan for the year 2006. This workshop took place on 27th April 2006. This workshop was well attended and the following highlighted issues were discussed:

- The likelihood of coming up with new proposals for the next phase of funding commencing 1st July 2008 and also the possibility of funding spin-off projects.
- Networking among all the four Public Universities.
- Strategies for enhancing Quality Assurance as academic institutions.
- Local collaborations among the four Public Universities, private universities, public and private sectors were encouraged, as this would promote collaboration with the Northern Institution on the project as well as other possible funders and stakeholders.
- Continuity and sustainability of project outcomes during and after the specified project period.

Higher Education Stakeholders' Workshop

A stakeholders' workshop aimed at bringing together stakeholders in Higher Education was held on 9th May 2008 at Grand Imperial Hotel Kampala under the theme 'The Role of ICT Infrastructure in Enhancing ICT Education Provision in Universities in Uganda'. Participants were mainly from the Academia, Development Partners, Government and Private Sectors, and the Critics of Higher Education in Uganda. The main objective of the workshop was to brainstorm and propose the way forward on the strategies that can be employed to ensure existence of appropriate ICT Infrastructure at Institutions of Higher Learning in Uganda. The recommendations from the Stakeholders

workshop are meant to provide background to writing of fundable proposals to the Development Partners with emphasis on the role of ICT Infrastructure in enhancing ICT Education Provision in Universities in Uganda. MUST took lead in organizing this conference on the Ugandan side. [Details of the workshop proceedings are in **appendix 8**].

2.4.4 D3: Upgrading Hardware and Infrastructure (Purchase of Computing Equipment) for all the 4 Public Universities

In October 2004 an advertisement was made in the local print media for potential suppliers to bid for the supply of the computing equipment. The Makerere University Contracts Committee carried out the selection of the bidders to supply the equipment. During procurement additional equipment was purchased to supplement the planned equipment:

The following equipment was purchased for the four Public Universities:

- Each university received 40 new computers for facilitating students;
- Each University received 20 UPSs to support the 40 computers
- Each University received 2 new servers (one for staff and the other for students);
- Each University received 1 rack and 2 heavy duty UPSs for the servers
- Each University received 2 new network printers (one for staff and the other for students);
- Each University received 2 new photocopiers (one for staff and the other for students);
- Each University received 5 computers and 5 UPS systems for facilitating researchers in Computer Science and Information Technology;

Installation of Local Area Network

During the procurement process of computing equipment for all the four Public Universities in 2005, it was noted that MUST had a furnished room but without a Local Area Network (LAN). Kyambogo University and Gulu University had no LAN and no furniture. Therefore, from some of the funds which had remained on the budget for the computing equipment, the MUST project laboratory of 40 computers was networked by Nile Computers Ltd. Kyambogo and Gulu Universities were also availed with furniture.

During the 14th Coordination Committee meeting which was held on 26th August 2005 in Gulu University, it was proposed that in case the project budget allows, 14M (fourteen million Uganda shillings only) could be shared equally between Gulu University and Kyambogo University for the purpose of installing the Local Area Network in the project computer laboratories. These two Universities topped this fund and had the LAN installed. Kyambogo University had its project computer laboratory installed with Local Area Network by Southern Business Solutions and Gulu University had a Local Area Network installed by Tri-Continental Ltd by end of January 2006.

Makerere University Faculty of Computing and Information Technology sent a staff member, Mr. Arthur Kwesiga to MUST and Gulu University to install Blackboard Software on the project servers in February 2006.

The Purchase of 4 Projectors (one for each Public University)

It was observed that there was a shortage of projectors for student / staff use in the laboratories in all the four Public Universities and so some of the funds which remained on the purchase of the project equipment were re-directed to purchasing four (4) projectors – one (1) for each of the 4 Public Universities. A Local Purchase Order (LPO) was issued to MFI Office Solutions Ltd., which was a pre-qualified supplier of four Dell LDC projectors. These projectors were supplied to Makerere University and then were subsequently delivered to the respective universities and put to use.

The Purchase of 4 Laptops for Sub-Coordination (one for each Public University)

During the 15th Coordinator's committee meeting, it was noted that the Project Sub-coordinators needed laptops for each one of them for the smooth running of their day-to-day Project coordination work. Therefore, it was duly agreed that four laptops should be purchased for the 4 project sub-coordinators from the funds meant for purchasing the equipment under the component for the Centre of Excellence. These laptops were supplied by International Business Solutions Ltd early December 2005 and are put to use in the four Public Universities.

Table 18: Computing Equipment Purchased

Univ.	Computer	Server	UPS	Photo copier	LAN	Network Printer	Rack	Lap tops	Projector	Table	Chair
MAK	40(Student) 5(Staff)	2	27	2	-	2	1	1	1		
MUST	40(Student) 5(Staff)	2	27	2	LAN	2	1	1	1		
GU	40(Student) 5(Staff)	2	27	2	LAN	2	1	1	1	40	40
KYU	40(Student) 5(Staff)	2	27	2	LAN	2	1	1	1	40	40

Engraving of Computing Equipment

All the purchased computing equipment was engraved for ease of identification. The serial numbers have got three digits such as 001, 099, 100, 101, and 999 as follows:

Table 19: An Illustration of Engraving of Computing Equipment

University	Engraved Number
Mbarara University of Science and Technology	Nuffic/MUST/CS/001
Makerere University	Nuffic/MaK/CIT/001
Kyambogo University	Nuffic/KYU/ICS/001
Gulu University	Nuffic/GU/DCS/001

2.4.4.1 Procurement of Hardware & Software for the ICT Centre of Excellence to be based at Makerere University Faculty of Computing and Information Technology.

Clustered Server Equipment

In 2005, bids were invited for the supply and installation of High availability cluster server. The tender was won by International Business Solutions Ltd. (IBSL). The high availability clustered server with automated backup system to be used for automated backup and restoration of database (oracle, mysql, postgres, etc), common software applications like blackboard and e-learning courses and email was delivered to Makerere University on 25th July 2006 and was successfully installed for use. Strategies on how this server should benefit all the four Public Universities in matters such as sharing information and expertise were laid collectively by the four Universities. This equipment was supplied by) a cost of Euro 116,166.61.

Terminal Computers

For effective functioning of the clustered server, twenty (20) computers and ten (10) UPSs were purchased. These computers are used as terminals to connect to the high availability clustered server system. With these terminal computers, the clustered servers is able to operate in multi-user mode and extend applications to end users without incurring the complexity of distributing, installing and maintaining applications software on the clustered server user devices. These 20 computers and 10 UPSs were supplied by Southern Business Solutions on 26th May 2006.

SMART Interactive Whiteboards

During the 24th coordinators' meeting which was held in MUST, it was agreed that two (2) SMART Interactive Whiteboards should be purchased for each of the four Public Universities from the Centre of Excellence funds. These whiteboards are meant for supporting and facilitating innovating teaching. All the eight (8) whiteboards were installed and are actively being used in the four Public Universities.

2.4.5 D4: Project Vehicle

In September 2004 the purchase for the project vehicle was advertised and among the companies that submitted a bid for the supply, Lornho Motors Uganda Ltd one of the renown Ugandan (local) car dealers won the bid for the supply of the project vehicle (Toyota Land Cruiser Prado). The Makerere University Contracts Committee undertook the evaluation of bids and award of tender.

Lornho Motors Uganda Ltd. supplied the Project Vehicle (Toyota Land Cruiser Prado) with Registration Number: UAA 459F (TOYOTA LAND CRUISER PRADO KZJ) to Makerere University on the 7th of January 2005 at a cost of Euros 36,362.91(excluding Value Added Tax (VAT). This vehicle is still in good condition and has been in use for project coordination activities for the four Public Universities since the time of delivery. The car will remain to be used for the benefit of the follow up project "*Strengthening ICT Training and Research Capacity in the Four Public Universities in Uganda*"

2.5 Component E1: Project Management and Coordination in Uganda

2.5.1 E1.1: Project Management Coordination by Ugandan Supervisor and Coordinator

Project Management in Uganda

Project Management was a continuous activity. The Project Management Team on the Ugandan side was led by the Overall Coordinator / Project Leader Prof. Venansius Baryamureeba. Dr. Ddembe Williams, Ms. Dora Bampangana and Ms. Consolate Komugisha assisted Prof. Venansius Baryamureeba. Dr. Patrick Ogao, the Long Term Expert up to 30th June 2007 coordinated mainly academic activities between the Southern and Northern Institutions.

In order to implement what was recommended in Activity E2.3: Quality Control and Advice mission (project mid term review) report, during the 26th coordinators' meeting which was held on 15th August 2006 at Makerere University, it was agreed that key staff members of the four Public Universities such as Deans, Academic Registrars and Heads of Departments should be availed with project reports. During the 27th Coordinators' meeting held on 22nd September 2006 at MUST, members agreed that each of the four Public Universities should have at least one person to assist the project sub-coordinators in doing project work especially since the three were Ph.D students (Mr. Henry Matovu, Ms. Theodora Mwebesa and Mr. Chris Mafabi) and would be busy with studies from time to time. These staff members were availed with coordinators' meeting minutes on a routine basis for updates on project progress. These

staff members also attended the coordinators' meetings (in attendance) whenever they were held at their respective Universities.

The following were nominated for this task:

- Makerere University: Dr. Tom Wanyama, Senior Lecturer and Ag. Deputy Dean (Academic Affairs), Faculty of Computing and Information Technology
- MUST: Mr. Evarist Nabaasa, Lecturer, Institute of Computer Science
- Kyambogo University: Ms. Jackline Ssanyu, Lecturer, Department of Computer Science
- Gulu University: Mr. Geoffrey Tabo Olok, Lecturer, Department of Computer Science

Coordination Committee Meetings

Since the beginning of the project on 1st July 2004, a total of 34 coordination committee meetings were held: 6 in 2004; 12 in 2005; 12 in 2006; 4 in 2007 and none in 2008. During coordination committee meetings, project progress was discussed; reports from sub-coordinators presented and new issues and strategies on the project discussed.

2.5.2 E1.2: Project Coordinator in Uganda Visit to NL

In 2004, one visit to NL was planned. Professor Venansius Baryamureeba travelled to the Netherlands from the 9th till the 11th of December 2004. The main purpose for this visit was to discuss further the issue of the proposed Long Term Expert- Mr. Henk Hindriks who was rejected by the southern institution on the basis of him not having the minimum academic qualifications for the duties and tasks described for him by the project. This was one of the hindrances to the signing of the Project Inception Report.

In 2005, a total of three visits were undertaken by the Project Coordinator. Visit I took place in March 2005. The Overall Coordinator / Project Leader in Uganda met with key people on the NPT project and had fruitful discussions on the way forward mainly for the year 2005 activities. Some of the key outcomes of this visit were: The Curriculum Development Workshop, which was planned for and took place in April 2005; and the issue of switching 2 MSc students in NL for 1 PhD student in NL and 2 MSc Students in UG. Exchanging funds for two master students to be trained in the Netherlands for one PhD candidate training in the Netherlands was discussed upon in the NL and both the Ugandan and Netherlands parties came to a consensus that this idea was acceptable in principle – applicable to all the four Public Universities. This was an issue raised by Public Universities in Uganda. However, Universities later opted to train staff for MSc as per the original project plan other than the proposed PhD. Other Issues discussed during this visit were:

- How this project could be of developmental service to the surrounding communities. During his visit, one of the services that were identified was corporate training in IT for organizations surrounding the 4 universities
- How women and the girl child can be empowered by this project;
- How this project could help in the eradication of poverty in the surrounding communities. This was found viable and more so relevant to especially Gulu University, which was currently being affected by war leading to a lot of poverty in the area. The strategy identified for this was the maximum use of the computing equipment like the 40 computers purchased under the project to start off some basic training programmes in computer applications at a minimum cost and may be even offer special discounts for ladies on the courses.
- How best Advisory Services can be offered to organizations surrounding the four Public Universities.

Networking in Higher Education and Research in ACP Countries Conference - in Belgium

During his first visit to The Netherlands in 2005, the Project Leader and Overall Project Coordinator was invited to attend a conference on Networking in Higher Education and Research in ACP Countries which took place on March 10th – 11th, 2005 in the Université Catholique de Louvain, Belgium organized under the project, 'Cooperation Programme in Higher Education'. The overall objective was to foster capacity building and regional integration in the field of higher education through institutional networking, and to support a higher education system of quality, which is efficient and relevant to the needs of the labour market, and consistent with ACP socio-economic development priorities. Among other things the following were discussed in this conference:

- How Northern and Southern Institutions could be able to work together for instance on joint course programmes and joint curriculum support activities.
- Joint Production of knowledge
- Development of a network for family medicine

Visit II took place on 10th May 2005 mainly to participate in the selection process of the Long Term Expert which took place on the 11th of May 2005. Dr. Patrick Ogao was selected. During this visit, the Overall Coordinator / Project Leader also visited the project-sponsored students in their respective universities. From 23rd to 25th May 2005, the Overall Coordinator / Project Leader travelled back to the Netherlands (The Hague) from London South Bank University where he had gone for an official visit to participate in the finalizing and signing of the Memorandum of Cooperation between Makerere University and London South Bank University. In particular he went back to attend a 3-day conference, 'A Changing landscape' organized by Nuffic. The aim of this conference was to make support to tertiary education and research in developing countries more effective. At this conference, many principal stakeholders attended including politicians and government officials, leaders and other representatives of higher education institutions, representatives of international organization and donors.

Visit III took place in the period 2nd – 14th October 2005. Prof. Baryamureeba travelled to the Netherlands for the purpose of having further discussions on the implementation of the project activities. During this 4th visit in 2005, the Project Leader together with the Netherlands counterparts worked on and finalized the Project Work plan and Budget for the year 2006 which was then forwarded to Nuffic.

In 2006, the Overall Coordinator / Project Leader (Prof. Venansius Baryamureeba) traveled to the Netherlands during the period 25th September 2006 - 1st October 2006. During his visit, the planning document for 2007 was worked on. Among others, the following issues were discussed and agreed upon as follows:

- Prof. Baryamureeba and Mr. Haarbrink held a meeting with the colleagues at Nuffic (Mr. Arie van Dijk and Drs. Ouindinda Nikiema) at which it was agreed that some of the contingency funds should be added to funds for the activity C4: Exposure Research Visits: UG Experts to NL such that the 8 Ph.D. students registered in Uganda that have already been to the Netherlands are able to have another 2 months' visit in NL in order to work with NL Ph.D supervisors and be able to publish at least one research paper together.
- It was also agreed that UG side gets an advance of 40% of the approved budget for 2007 in order to be able to fund some of the activities that still needed funding in the year 2006 since Nuffic had released only 80% of the budgeted funds for 2006. This 40% advance of Euros forty six thousand (Euros 46,000) was received on the UG project account on 9th November 2006.

In 2007, Prof. V. Baryamureeba – Overall Coordinator / Project Leader in Uganda travelled to NL from 4th – 9th November 2007, mainly to discuss the project progress and progress of the successor Project 'Strengthening ICT Training and Research Capacity in the Four Public Universities in Uganda'. Here below are specific activities carried out by the Overall Coordinator / Project Leader in Uganda while in NL:

Table 20: UG Project Coordinator Activities in NL in 2007

	Date	Activity	Institution
1	7 th November	<ul style="list-style-type: none"> - Met with Prof.dr. Theo van der Weide, Nicole el Moustakim, Ed Simons and Stijn Hoppenbrouwers. - Met 3 Ph.D students (John Ngubiri, Theodora Mwebesa and Benedict Oyo). - Met Ph.D candidates under the new NPT project 	Radboud University Nijmegen
2	8 th November	<ul style="list-style-type: none"> - Met three UG Ph.D candidates supervised by Prof. Dr. Wil van der Aalst and Dr. Ir. Mark van den Brand. - Met Prof. Dr. Christian Lange, Prof. Dr. Ir. Kees van Hee, Dr. Ir. Mark van den Brand and Prof. Dr. Wil van der Aalst over Ph.D supervisions on the new NPT project. 	Eindhoven University of Technology
3	5 th November	<ul style="list-style-type: none"> - Met Madeleine Gardeur, Prof.dr.ir. J. Nerbonne, Prof.dr G.R. Renardel de Lavalette and Engelse zaal over project progress matters. - Met Ph.D supervisors Prof.dr. J. Nerbonne, Prof. dr. J.M. v.d. Hulst, Dr. M. Biehl (Assistant Professor of Intelligent Systems), dr.M.H.F. Wilkinson (Lecturer of Intelligent Systems) and Prof.dr G.R. Renardel de Lavalette to discuss Ph.D student supervision. - Met PhD students 	University of Groningen
4	6 th November	<ul style="list-style-type: none"> - Met with PhD supervisors - Met with Dr. P. Avgeriou (Assistant Prof. in Software Engineering), Mr. Erik Haarbrink and Prof. John Nerbonne 	University of Groningen
5	9 th November	<ul style="list-style-type: none"> - Travelled to The Hague, at the Nuffic Headquarter offices to meet with Mr. Ouindinda Nikiema and Mr. Arie van Dijk. 	NUFFIC

2.5.3 E1.3: Project Management Support by LTE in UG

The LTE, Dr. Ogao arrived in Uganda on the 23rd of July 2005. He provided support mainly in four areas: Research development including supervision of PhD students (50%); Teaching on both undergraduate and postgraduate programmes (20%); Project management (20%); and Other activities such as curriculum development (5%). He was involved in the day to day management of the above project activities. [Details are contained in section 2.2.1].

2.5.4 E1.4: Improving Staff Recruitment Procedures

To be able to systematically handle recruitment of staff, a Human Resources Office was established at the Faculty of Computing and Information Technology to liaise with the Directorate of Human Resources at the Centre, the University Appointments Board and the Office of the Vice-Chancellor for recruitment of both fulltime and part-time staff. The Human Resources Office works hand in hand with the Faculty Appointments and Promotions Committee that receives information from the Departmental committees.

Makerere University Faculty of Computing and IT contributed to the revising of the Policy on Appointment and Promotion of Academic Staff that was approved by The University Council at its 106th meeting held on 6th and 7th July 2006. The contribution was mainly on introduction of Fast Track for New Entrants and promotion of staff using the same track.

In addition, staff were and continue to be recruited and supported to undertake trainings in soft skills and other skills dependant on skills gaps identified. This was done across the board among all the universities.

2.5.5 E1.5: Awareness and Promotion on Gender Issues

In the year 2004, the four Public Universities carried out a baseline survey in the respective regions where their Universities are situated. The main essence of this survey was to establish the utilization and accessibility of ICT related facilities by gender in secondary schools. Follow up of this survey as phase II of the activity was through training of females in the respective University neighborhoods in ICDL and this activity began in the year 2005. Makerere University, MUST and Gulu University completed the training in the year 2005. Kyambogo University began the activity in the year 2005 and completed it in 2006. Below are the details about the training:

Table 21: Training of Females in ICDL

	University	Dates of Training	No. Trained
1	Makerere University	17 th October 2005- 2 nd December 2005	55
2	MUST	28 th November 2005 - 14 th December 2005.	43
3	Gulu University	16 th November 2005 - 30 th December 2005.	60
4	Kyambogo University	19 th December 2005 - 20 th January 2006.	48

During the year 2006, each of the four Public Universities was facilitated with four million Uganda shillings (UGX 4,000,000) to carry out the Awareness and Promotion on Gender Issues activity. Here below are the activity results:

At Makerere University, a total of thirty seven (37) out of forty one (41) women successfully completed the ICDL course on 12th May 2006 under the Awareness and Promotion on Gender Issues activity. A graduation ceremony at which certificates were issued to the successful participants was held on 18th May 2006 at Makerere University Faculty of Computing and Information Technology. The participants included twenty (20) legal practitioners from Uganda Association of Women Lawyers (FIDA) and another twenty one (21) women with disabilities from the National Union of Women with Disabilities in Uganda (NOWUDU). Out of the 21 disabled women, nine (9) were deaf.

At Kyambogo University, ICT training was conducted from 12th June 2006 – 24th June 2006. A total of 28 female participants were trained. These participants were got from Kyambogo University and other Institutions/Organizations such as Uganda Police, Young Women Christian Association (YWCA), Uganda People's Defense Force, UgaBbytes, Women of Purpose and Gabula Atudde Women's group. This training was based on the ICDL curriculum.

At Mbarara University of Science and Technology, the training was held in the period 12th June – 26th June 2006. The International Computer Driving License (ICDL) training was done for women and Thirty five (35) women successfully completed the course. These women were from various sectors as follows: Religious, Women Associations, Tertiary Institutions, Secondary School Teachers, health sector, Non Governmental Organizations and Local Government.

At Gulu University, a training based on the ICDL curriculum was conducted for female teachers in Gulu district. This training started on 29th May 2006 and ended on 9th June 2006. Twenty six (26) women successfully completed the training. The course participants were all from primary and secondary schools in Gulu district.

2.5.6 E2.1: Project Management and Coordination in the Netherlands

The day-to-day project activities were managed by the Project Coordinator at the Office for International Relations of the University of Groningen. The Project Coordinator was supported by the Financial Officer and the Project Assistant. At the start of the project, Dr. Rien Dam was Coordinator, Mr Erik Haarbrink was Financial Officer, and Ms. Gonny Lakerveld was Project Assistant. Due to an internal re-organisation of activities within the Office for International Relations, Dr. Hans Schoenmakers replaced Dr. Rien Dam as Coordinator, and Ms Marieke Farchi replaced Ms. Gonny Lakerveld as Assistant. Mr Haarbrink continued to be the project Financial Officer.

Dr. Hans Schoenmakers was Project Coordinator until his retirement on 1 December 2005. Mr. Erik Haarbrink, who was already Financial Officer in the project, succeeded him as Project Coordinator, supported by Ms. Marieke Farchi. This project coordination team was the main liaison of the Ugandan partners, the other Dutch partners, and Nuffic. They were responsible for arranging all practical and financial matters for the support of the visiting MSc's and PhD's at the University of Groningen. Furthermore, they had the responsibility of organising meetings for the entire project coordination committee. Finally, they prepared the annual reports and the financial report for the entire 4 years of the project.

On 4th October 2005 during the third visit of Prof. Baryamureeba to the Netherlands a mini-seminar was organised at the University of Groningen where all Master's and PhD students in the project held presentations on their studies or research. It was very beneficial for the students and researchers from Nijmegen and Groningen to meet each other and to be able to discuss their studies and research together. It was agreed that such a seminar should take place at least once a year.

Audit Reports

In March 2006, the External Auditor visited Makerere University, Kyambogo University and Mbarara University of Science and Technology to verify and audit all the activities implemented in the three Universities. This Auditor was not able to go to Gulu University due to political instability in the region. The Audit report was submitted to Nuffic in May 2006.

On 29th March 2007 Makerere University Faculty of Computing and IT received the 2006 Nuffic Project Financial Audit report. It was signed on 5th March 2007. A copy was dispatched to Nuffic on 29th March 2007.

The Audit reports for 2007 and 2008 were combined on request by Nuffic to submit these reports at once as there were a few activities left to be carried out in 2008. The two reports up to 30th June 2008 have been received from the Auditor General's Office and a copy dispatched to NUFFIC on 12th November 2008.

2.5.7 E2.2: Project Academic Supervisor Missions

Professor John Nerbonne, the new project Academic Supervisor in the Netherlands visited Uganda during the period 10th – 14th June 2007 and Mr. Erik Haarbrink, the Project Co-ordinator and Financial Officer visited Uganda during the period 6th – 14th June 2007 respectively. Their main visit activities were:

- Meeting with academic staff involved in the project activities of the 4 universities and the (sub) coordinators;

Forge the way forward for the consortium/research groups and the strategy of the project to prospective Ph.D students on the new Nuffic project, 'Strengthening ICT Training and Research Capacity in the Four Public Universities in Uganda';

- Meeting with representatives of research groups in Uganda and prospective Ph.D supervisors for the new project.

During this visit, the two also met with project and University Management Staff at Makerere University, Kyambogo University and MUST to discuss matters of the current and new project. Discussions about planning/inception report and issues raised by Tender Evaluation Committee for the new project were also held.

While at Makerere University, Professor Nerbonne gave a lecture on Language and Text Technology to prospective Ph.D students and on-going Ph.D students from the four Public Universities as well as academic staff and researchers from Makerere University on 12th June 2007.

NL Project Coordinator and Financial Officer visit to Uganda

In October 2004, the then Dutch Project Coordinator, Dr Rien Dam, and the Financial Officer, Mr Erik Haarbrink, visited Uganda. They discussed the planning of project activities for 2004 with the Ugandan partners. Mr Erik Haarbrink instructed the Ugandan financial department in the reporting according to Nuffic regulations. Dr. Rien Dam also attended the curriculum workshop and a Coordination Committee Meeting.

In May 2005, Dr. Hans Schoenmakers, at that time the Project Coordinator, and Mr. Erik Haarbrink, the Financial Officer on the Netherlands side came to Uganda mainly for another NPT project at Uganda Martyrs University, Nkozi, but also visited Makerere University.

From 31st Jan - 2nd February 2006, Mr. Erik Haarbrink- Project Co-ordinator and Financial Officer, and Ms. Marieke Farchi- Project Assistant, visited Makerere University Faculty of Computing and Information Technology during which period they met with some of the Ph.D students on the project who were in Uganda at that time. They also had discussions with Mrs. Theodora Mwebesa and Mr. Henry Matovu on their upcoming research visits to the Netherlands. Furthermore, there were discussions on the reporting of 2005, on the planning for 2006, on the financial administration of the project, and on a NFP refresher course in e-learning.

Closing of the Project on 3rd July 2008

Although the project ended on 30th June 2008, the official closing was held on 3rd July 2008 at Makerere University. Prof. Koos Duppen, Vice-President University of Groningen, Prof. John Nerbonne, Project Academic Supervisor in The Netherlands, Mr. Erik Haarbrink, Project Coordinator in The Netherlands and Dr. Robert Janz, Academic Supervisor University of Groningen were present. [Proceedings of this report are in **appendix 9**].

2.5.8 Monitoring and Evaluation of the Project

2.5.8.1 Monitoring and Evaluation of the Project – 2005

Mr Said Allaoui, at that time the Nuffic Senior Programme Officer visited Uganda on a mission to monitor and evaluate NPT projects in Uganda among which was the project on, 'Building a Sustainable ICT Training Capacity in the four (4) Public Universities in Uganda'. One of the activities was to prepare for the Learning Workshop on the Implementation of NPT projects in Uganda, which took place on the 4th May 2005. Some of the objectives for this workshop were:

- To enhance networking among NPT projects in Uganda as well as sharing and exchanging experiences (best practices) in project implementation from which this project benefited a lot.
- To Network all the Nuffic Funded projects in Uganda, bringing together all the NPT projects as well the stakeholders leading to a good networking system among all the Nuffic funded projects for proper monitoring and management as well as identification of future prospects for other projects in Uganda.

Mr. Allaoui later resigned from Nuffic and Mr. Ouindinda Nikiéma took over as the new Senior Programme Officer with effect from October 2005.

2.5.8.2 Monitoring and Evaluation of the Project – 2006

Mr. Ouindinda Nikiéma, Nuffic Senior Programme Officer and Mr. Arie van Dijk, Nuffic Financial Officer visited Uganda on a mission to monitor and evaluate all NPT projects in Uganda among which was the project on, 'Building a Sustainable ICT Training Capacity in the four (4) Public Universities in Uganda'. One of the activities the Nuffic Senior Programme Officer did was to prepare and conduct a Learning Workshop on the Implementation of NPT projects in Uganda which took place on the 25th May 2006. The main objectives of the workshop were to:

- Engage Stakeholders in a consultative process on key issues concerning NPT projects in Uganda;
- Share and exchange experiences (best practices) in project coordination, management, and implementation;
- Share a common vision on monitoring and evaluation in the context of NPT;
- Identify and promote coherence, synergy and convergence in the area of guidelines and mechanisms for project coordination, management and monitoring of the different NPT projects;
- Assess the progress made so far in dealing with the challenges identified during the last NPT workshop held in May 2005;
- Debrief and discuss the preliminary findings of the monitoring mission;
- Enhance networking and linkages among NPT projects in Uganda.

During this mission, a meeting between the Nuffic Senior Programme Officer, the Financial Officer and the Project Management team at Makerere University comprising of: Prof. Venansius Baryamureeba (Overall Coordinator / Project Leader in Uganda), Dr. Patrick Ogao (Long Term Expert), Dr. Ddembe Williams (Makerere University Project Sub-Coordinator) and Ms. Dora Bampangana (Project Assistant / Secretary) was held. At this meeting, the following issues were discussed:

- The new developments and innovations achieved in all the four Public Universities as a result of output from the project
- Plans being put in place to avail more physical infrastructure to the ICT Centre of Excellence like the ongoing construction of 12,000 square metres building
- Sustainability of project outputs when the project period expires.
- The completed project activities and the way forward for the year 2006.
- Community involvement in the project (and after project) activities.
- The issue of Teaching & academic support missions: Activity A2.5.
- Financial project issues such as the transfer of funds for purchasing of equipment for the Centre of Excellence which was mainly due to the delay of transfer of funds for this activity.

2.5.8.3 Monitoring and Evaluation of the Project – 2007

During the period 23rd September – 10th October 2007, Mr. Ouindinda Nikiéma Nuffic Capacity Building Programmes Officer, came to Uganda for a monitoring and evaluation of NPT projects mission. During his mission, he visited three

public universities as follows: Makerere University on 25th September 2007; Gulu University on 26th September 2007 and MUST on 1st October 2007.

According to the report by the expert, the field visits to the other involved universities in Gulu and MUST confirmed that all conditions had been met for a smooth implementation of the project: commitment of institution leadership was reported to be high; required space was available; staff development activities already incepted; staff ready for take-off; cooperation amongst partners was also judged to be satisfactory; communication on project matters was outstanding; coordinating role of Makerere University was also well appreciated.

During this mission, an NPT Implementers Workshop was held in Kampala, Grand Imperial Hotel on 8th October 2007 with the following objectives:

- Enhancing networking among NPT projects in Uganda;
- Sharing and exchanging experiences (best practices) in project implementation;
- Sharing and exchanging experiences (best practices) on project coordination and management;
- Sharing a common vision on monitoring and evaluation in the context of NPT;
- Identifying and promoting coherence, synergy and convergence in the area of guidelines and mechanism for project coordination and management of the different NPT projects;
- Assessing the progress made so far in dealing with the challenges identified during the last NPT workshop held in May 2006;
- Debriefing the workshop participants on the preliminary mission findings.

The workshop was also used to discuss information related to the status of the NPT programme and its contribution to the improvement of sector performance.

2.5.9 E2.3: Quality Control & Advice – Mid Term Evaluation

In August 2006, a Quality control and advice mission took place in Uganda. This mission was mainly for intermediate evaluation of project progress and mid-term evaluation of project quality and progress, long-term policy advice and sustainability issues. The Advisory Board consisted of two senior experts in the field of ICT and education from the Netherlands (Dr. K.L.L.M. Dittich and Dr. H.J. van Linde) and another expert from London South Bank University (Professor Dilip Patel). The Terms of Reference of this mission among others were:

- Reviewing project documentation: project documents, progress reports, mission reports, publications;
- Conducting interviews with stake-holders, defined as persons and institutions in Uganda and in the Netherlands, directly or indirectly involved in the NPT project (project staff, collaborating individuals, departments and colleges);
- Collection and analysis of other relevant information.

The main issues which were tackled during the mission were: Education Development, Staff Development, Research Development, ICT Policy and Infrastructure, Project Management and Coordination and then Future Recommendations.

During this mission, the experts were able to visit Makerere University, MUST and Kyambogo University and met the Universities' key staff members. However, due to political instability in Gulu District, the experts were not able to travel to Gulu University. Nevertheless the experts met and had discussions with Gulu University staff at Makerere University. The experts met with key management staff of the four Public Universities such as Academic Registrar of MUST and Vice Chancellors of Makerere University and MUST as well as staff working for / benefiting from the project such as the Project sub-coordinators and PhD students training from UG and those training in NL but were in UG at the time. The visit /meeting schedule was as follows:

- Makerere University : 10th August 2006
- Gulu University : 10th August 2006
- Kyambogo University : 12th August 2006
- MUST : 14th August 2006

Here below is the summary of some of the recommendations which were made both for the remaining project period and the sustainability of the project results:

- That Nuffic finds funds to extend this valuable project in some way in order to sustain the achievements when the project ends in 2008. That since there will be little activity in the final year of the project; it might be useful to define a follow-up project in such a way that the projects overlap.
- That the project management grooms future 'champions' for the various areas within the project to supplement take over naturally in case the Overall Coordinator / Project Leader should for any reason not be available any longer in the future.
- That it was necessary for the four Public Universities in Uganda to aim at more diversity in the bachelor and master courses they offer. It was suggested that courses in the smaller universities work towards having a more professional approach rather than an academic one. It was also suggested that one or two of the smaller universities could further specialise in the training of teachers.
- That financial means could be found within the project to include a workshop on modern university and research management in 2007 as this would serve two purposes: (i) Preventing of the gap between the ICT units in the Universities and the rest of the university; (ii) Introducing modern university management including the use of ICT to the higher levels of university management in line with the present project.
- That if possible, some of the minor suggestions which were made about Ph.D students (in a Section 4 of the mission report) should be implemented even in this project.
- That project leaders in Uganda and the Netherlands should get together with Hanze University as soon as possible to have Hanze University take up its role on the project at least in the remaining two years of the project.
- That in order to bring the four Public Universities in Uganda forward in the ICT world, a rather delicate balance would have to be maintained between the three closely connected pillars of: capacity building, infrastructure and research.
- That the project needs to work more towards shifting from quantity to quality: Better Ph.Ds and M.Sc rather than simply more as this would be very helpful in getting a significant research programme in place gradually. **[Full Report is in appendix 10]**

On 10th August 2006, Dr. Karl Dittich also gave a presentation on Developments in the Field of Quality Assurance in Europe to administrators of the four Public Universities particularly involved in Quality Assurance matters.

3.0 Description of Measures Being Undertaken To Ensure Sustainability of the Project Outputs

3.1 Human Resource and Research Development

One of the key outputs of Human Resource and Research Development was human resource with M.Sc. and Ph.D qualifications trained, and strengthened research collaboration between the Public Universities. The measures that were in place to sustain this included creating a Centre of Excellence in ICT Training and Research at Makerere University. One of the planned interventions under the Centre of Excellence was starting Ph.D. programmes in Computer Science, Information Technology, Information Systems and Software Engineering (with one year of coursework and 2 years of research) at Makerere University i.e. using the available Ph.D holders in Computing and ICT to produce more Ph.D. holders. Another activity under the Centre of Excellence was joint Ph.D. student supervision and joint research projects. Once there is a critical mass of Ph.D holders in Computing and ICT at each Public University, it is hoped that each Computing and ICT Faculty / Institute / Department will transform into a Centre of Excellence in Computing and ICT Training and Research.

3.2 International Journal of Computing and ICT Research (IJCIR) - <http://www.ijcir.org>

In an effort to assist students and staff to be able to publish their research work in international journals, Makerere University registered and now publishes a journal, 'International Journal of Computing and ICT Research'. This journal, which is both online (ISSN 1996-1065) and in print version (ISSN 1818-1139), attracts high quality papers from many researchers and managers in the field of Computing and ICT from all over the world. Makerere University Faculty of Computing and IT hosts the journal on behalf of Makerere University. It was officially launched in June 2007 i.e. Volume 1 Number 1 was published in June and Volume 1 Number 2 in December 2007. Volume 2 Number 1 was published in June 2008.

3.3 Annual International Conference on Computing and ICT Research (ICCIR)

Since 2005, Makerere University organizes and hosts an Annual International Conference on Computing and ICT Research, beginning every Sunday of the 1st week of August every year. These series of conferences provide an international forum for researchers and practitioners to present and discuss the state-of the-art research and practices in computer science, Software engineering, information systems, information technology, computer engineering, data communications and computer networks and ICT for sustainable development. They bring together the world's most respected authorities in the above disciplines. All the four public universities fully participate in these annual conferences. More information on the conference is on: www.iccir.cit.ac.ug.

3.4 Research Seminars

Researchers from the four Public Universities continue to be invited to these seminars on free participation. [Refer to Section 2.3.1.4 for more details].

3.5 North-South Collaboration Programmes

During the project period there were initiatives by both the Institutions in Uganda and Institutions in the Netherlands to begin inter-university collaboration activities that may not be covered by the current project funding. These activities are expected to continue even after the project is completed. The activities included joint research, joint student supervision, staff exchange, student exchange, external examining, and additional graduate scholarships (not under the project) to be undertaken in the Netherlands.

3.6 South-South Collaboration Programmes

During the project period, institutions in Uganda identified key areas of collaboration during and after the project completion. These areas included joint research, joint student supervision, staff exchange, student exchange,

external examining, organizing joint conferences and workshops, quality assurance (peer reviews), resource sharing such as pooling resources to setup state-of-the-art computing facilities that could be used by all the Public Universities and joint subscription to online journals. The plan is to have the monthly project coordination committee meetings replaced by bi-annual joint workshops. These workshops will be rotational and academic and administrative staff and student representatives will attend.

3.7 Online ICT Education Programmes

One measure of sustaining online programmes is to avoid duplication of efforts in developing online courses. The Public Universities will ensure that all content developed by each university is available to other universities so that they can simply customise it to their needs. The Uganda National Council for Higher Education has put in place regulations on subject benchmarks to harmonise similar courses currently offered under different names in different universities. This harmonisation will make it possible to have student exchange among the Public Universities in Uganda as what is offered at each university will be common knowledge to all Public Universities. Makerere University Faculty of Computing and Information Technology has already developed online courses.

3.8 Curriculum Development

To sustain quality curricula in Computing and ICT, the four Public Universities will continue working with organizations such as the Curriculum Development Centre, the National Council for Higher Education and the National Information Technology Authority – Uganda (NITA-U) to ensure that all Computing and ICT curricula at the Public Universities meet minimum standards. Joint curriculum development workshops and seminars will continue to be encouraged in order to share experiences and best practices.

3.9 ICT Policies and Master Plans

In August 2005, Makerere University Faculty of Computing and Information Technology under the NetTel@Africa Programme (www.nettelafrica.org) started running the Postgraduate Diploma in ICT Policy and Regulation to address the issue of lack of experts in ICT Policy and Regulation. Joint workshops and seminars on ICT Policy and Master Plan Reviews continue to be conducted to ensure that the existing policies are at par with the developments in Computing and ICT.

3.10 Gender Balance

The policies which were developed during the project period to promote gender balance in both the number of academic staff and the number of students will continue to be adopted by the respective universities after the project period. Policies focusing on recruitment of (both academic and administrative staff) and students will continue to be reviewed through sensitisation workshops from time to time.

3.11 Staff Exchange Programmes

Staff exchange among the public universities shall be encouraged. Makerere University is already sending its staff as visiting fellows at the other three public universities in the area of Computing and ICT.

4.0 Resulting Spin off Projects

Through appropriately addressing its objectives, the project has resulted into several other spin-off projects and collaborations. Some of these projects are directly under Nuffic and many others have been born as a result of improved quality outputs from this project such as quality graduates, improved research, better computing facilities and more qualified staff. Some of these spin off projects are highlighted below:

4.1 NPT Project on 'Strengthening ICT Training and Research Capacity in the Four Public Universities in Uganda'

One of the recommendations made to Nuffic in the September 2006 project mid-term review report for the project was for Nuffic to find funds to extend this project to build on the impressive achievement. It was also pointed out that there would be relatively little activity in the final year of the project due to its nature. It was thus deemed useful to define a follow-up project in such a way that the projects overlap. To this effect a proposal was written leading to Nuffic awarding the four Public Universities yet another NPT project on '*Strengthening ICT Training and Research Capacity in the Four Public Universities in Uganda*'. The overall objective of the Project is to strengthen the Capacity of Makerere University Faculty of Computing and IT, the Institute of Computer Science at Mbarara University of Science and Technology, the Departments of Computer Science at Kyambogo and Gulu Universities to develop, implement and manage relevant educational and research programmes for poverty alleviation, rural and economic development.

The lead institution in the South is Makerere University Faculty of Computing and Information Technology with Mbarara University of Science and Technology, Gulu University and Kyambogo University as partners; and the lead institution in the North is the University of Groningen with Radboud University Nijmegen (RUN) and Eindhoven University of Technology (TUE) as the consortium partners. The target group is University staff and students in the above institutions and ICT Policy makers.

The project will be implemented in a period of four (4) years and it commenced on 1st June 2007 with a maximum Nuffic grant of Euro 5,700,000. The southern partners are to contribute to the project in form of financial and material inputs such as complementary funding and equipment, physical infrastructure and human resource. Thus it is expected that at completion, the project will be worth 6,200,000 Euros.

4.2 NPT Project on 'Strengthening the Institutional Capacity of Uganda's Technical Colleges

After the start of the project 'Building ICT Training Capacity in Public Universities in Uganda', there was a realisation of the need to strengthen institutional capacity in technical colleges in Uganda. This project was subsequently awarded by Nuffic to four technical colleges in Uganda namely: Uganda Technical College (UTC) Bushenyi; UTC Elgon; UTC Kichwamba and UTC Lira. The Lead institution in the North is Hanze University Groningen. Co-partners in the south are Makerere University and Kyambogo University. Its implementation started on 1st March 2006 and will end in 2009 with Nuffic grant of Euro 1,999,990. This project's general objectives are:

- To improve institutional strategy of the four UTCs
- To strengthen ICT in management and administrative processes
- To strengthen external relations
- To increase relevance for the world of work sector
- To strengthen the quality of courses given at the four UTCs

4.3 Connecting the EU & sub-Saharan Africa for ICT Partnerships (EuroAfriCa-ICT) -

This is a European Commission sponsored project that officially started in January 2008. The new European Strategy for Africa adopted by the EU Council in December 2005 gave a comprehensive policy framework that reflects the priorities of the EU in its relationship with Africa - Towards a deeper and stronger cooperation between Africa & the European Union. The development of EU-Africa Science and Technology cooperation on ICT is of mutual and strategic interest since ICT has been identified as an enabler for the sustainable and long-term development of the African continent.

The project's main objective is to identify, promote and support strategic Science and Technology cooperation opportunities on ICT between European and African organizations, and to support policy dialogue between Europe and Africa.

Beneficiaries of this project include: Orionis, a Division of Sigma Consultants (France), The Meraka Institute of CSIR (South Africa), The Panos Institute West Africa, PIWA (Senegal), The Academy of Sciences for the Developing World, TWAS (Italy), The Africa Unit of The Association of Commonwealth Universities, ACU (UK), Makerere University (Uganda), The Kigali Institute of Science & Technology (Rwanda), The Caribbean Academy of Sciences (Jamaica), and The Agence Universitaire de la Francophonie (Belgium). [More details are on www.euroafrica-ict.org]

4.4 Open Mobile Electronic Vaccine Trials (OMEVAC)

This is an interdisciplinary action research project that combines health and information technology expertise with field studies in Africa. The primary project objective is to develop OMEVAC, a complete, secure, mobile and electronic system for data collection and management in vaccine trials; from source to publication and using while complying with international standards and requirements. It will be field-tested in Africa in ongoing trials and be available at no cost including all developed source codes and documents. The partners of this application have already developed several different systems including the EpiHandy, a generic electronic open source and free mobile data collection and management system, that is being used for regular studies in low income countries.

The consortium consists of Norwegian and international organizations, universities, software and hardware development groups and includes TDR/WHO, HandheldsForHealth.org (Linux company in Bangalore India), Makerere University, Uganda, INDEPTH Network / Malaria Clinical Trial Alliance, NSD (Norwegian Social Science Data Services), Promise Consortium and 2 faculties at the University of Bergen (Centre for International Health and InfoMedia) - Lead Institution. For more information visit: <http://tinyurl.com/243ofl> or <http://www.cit.ac.ug/disd/projects.htm>

4.5 National Software Incubation Centre

The Rockefeller Foundation has provided the seed grant for the establishment of the software incubation facility at CIT. The facility will provide computing graduates from all universities with hands-on skills in software development. The students will be mentored by industry professionals from Uganda and other countries namely from IBM, Cisco and FedEx who will develop problems in form of projects for the students to undertake. The primary objective of this project is to meet the dynamic and fast-evolving software needs of the nation. The facility will not only provide the students with technical skills, but also with other skills like entrepreneurship, marketing positioning and product branding.

Currently, the project has recruited 120 graduates and is well underway. Training is in progress and the facility is expected to deliver 25 cutting-edge projects in December when it ends its first cycle.

4.6 Pan-African E-network Project

Under the Regional Leading University for the Pan-African E-network Project, Makerere University was selected by the African Union to be the ICT Centre of excellence for Eastern Africa region and is mandated to oversee ICT African Union Initiatives in 13 countries on TeleEducation project. Makerere University was also selected as the HUB among the 5 lead Universities in Africa on the same project. Makerere University is one of the five Universities in Africa in each of the five African regions (Eastern, Western, Northern, Southern and Central) selected to be a Lead Partner. CIT manages and coordinates this project in Uganda and acquired high-tech infrastructure for example production equipment, VSAT Antenna, studio equipment, among others. This equipment is handy in facilitating teaching in the Faculty.

4.7 AVOIR KEWL.NextGen E-Learning Project for African Universities

CIT received equipment worth approximately \$1.5M. This was funded by USAID & SUN Systems. The project is a collaboration with several African Universities and the University of the Western Cape (UWC) in South Africa as the driving force behind the “African Virtual Open Initiatives and Resources” (AVOIR) network. Equipment received include: seven seas technologies, 3 Sun Fire X 4200 servers, 4 Sun Fire x 2200 servers, a sun storage, a Sun Ultra 20, a Sun storage tape auto loader 24 slots, 20 Sun Ray Thin Clients, 21 LCD Monitors and a Sun Radc 1000-38.

4.8 The Memorandum of Understanding (MOU) Between Makerere University Faculty of Computing & IT and the First Exec Company of Mauritius

In 2008, Makerere University Faculty of Computing and IT signed an MOU with The First Exec Company which is based in Mauritius. This company is committed to coordinating the gathering of requirements from Mauritian companies and communicating such requirements to CIT in Uganda. Such requirements include cooperating in the recruitment of IT professionals from Uganda through the Faculty to be recruited in Mauritius.

5.0 Project Success Stories

5.1 Project Recommended as Successful by the mid-term review team in 2006

Two experts from The Netherlands - Dr. K.L.L.M Dittrich (NVAO) and Dr. H.J. van Linde (former director of SURF Foundation) - and one from the UK - Prof. D.K. Patel (LSBU) - were appointed to the board for mid term review of the project in 2006. They carried out the mission and in their report ascertained that the project had had a substantial, although varying impact in all the four areas of: educational development, staff development, research development and ICT policy.

In the advisory board's opinion, the project was an outstanding success unanimously confirmed through document review and discussions with key project stakeholders ranging from University Vice Chancellors to the students. This success was attributed to the vision, the motivation and the management skills of Professor Venansius Baryamureeba, the Overall Coordinator / Project Leader in Uganda.

5.2 Institutional Growth of the Four Public Universities

All the units supported by the project have gone through Institutional transformation in terms of programmes offered, the number of students, staff and infrastructure development:

Makerere University Faculty of Computing and Information Technology (CIT)

- Was still an Institute of Computer Science with only one department and is now a fully fledged Faculty with four academic departments of Computer Science, Information Systems, Information Technology and Networks.
- CIT now runs four PhD programmes, 4 Master's programmes, 5 Postgraduate Diploma Programmes in addition to the 2 undergraduate degree and one diploma programmes all aimed at building ICT human capacity for both the private and public sectors including Universities.
- CIT also hosts the Annual International Conference on Computing and ICT Research that begun in 2005 and takes place in August of every year.
- In 2006, the Faculty of Computing and IT started an International Journal of Computing and ICT Research (www.ijcir.org)-- ISSN 1818-1139, which is both online and in print version, and attracts high quality papers from many researchers and managers in the field of Computing and ICT from all over the world.
- There has been tremendous Institutional growth in the number of students, staff and infrastructural development. Currently, *CIT is the largest Computing Faculty in Africa* with a student population of 5,000. In addition CIT has taken the lead in producing excellent IT graduates in the region and through collaborations at hand the Faculty is destined to reap big. For instance the government of Mauritius has signed a memorandum of understanding on among others external recruitment of IT experts to help fill their human resource gap. The first batch comprising of 300 Ugandans with IT expertise will have an opportunity of working in the Indian Ocean Island of Mauritius in 2008.
- The Faculty has over 247 lecturers including Professors.
- CIT has the largest computing facilities in Africa housed in 15,000meters of space worth \$17million (UGX 30 billion). Its two buildings can accommodate up to 10,000 students in one sitting. In the new state-of-the-art building alone there are: 6 computer labs each accommodating 700 students of which one is fully equipped; 4 smaller computer labs each accommodating 120 students of which two are fully equipped; and 14 small and big lecture theatres.
- The student labs are currently equipped with 3000 new computers and an assortment of ICT equipment.

- It has specialized labs such as Multimedia Lab, Advanced GIS Lab, Mobile Computing lab, Software Incubation lab, E-Learning Lab, Multi-Media Studio, software engineering lab; and Computer Engineering lab. Other Public Universities are encouraged to use these resources. Plans are underway to establish a fully fledged Desktop publishing Unit.

Mbarara University of Science and Technology (MUST)

- Has also experienced institutional growth since 2004. The Department of Computer Science has been transformed into an Institute of Computer Science.
- MUST has since begun two undergraduate degree programmes: Bachelor of Information Technology and B.Sc in Computer Engineering programme bringing undergraduate Programmes to three.
- To date, the Institute of Computer Science has an average number of four hundred and twenty (420) students.
- The Institute of Computer Science has 15 permanent staff members, of whom 7 (Seven) are on PhD Training programmes under the Nuffic project (s).
- It also has 4 qualified technicians to manage its ICT infrastructure.
- The Institute of Computer Science has 4 computer laboratories with a capacity of 80 and 50 and 40 and 100 respectively.
- MUST has had a very positive impact on the surrounding communities especially in sensitization and training of women in ICT.

Kyambogo University

- Existing academic programmes have been strengthened. Kyambogo University has two more academic programmes i.e. Postgraduate Diploma in Computer Science and Bachelors degree in Information Systems which are planned to commence in August / September 2009.
- Student enrollment on the existing programmes has steadily been increasing for the last two years. Currently 370 students are enrolled (270 on Bachelor of Information Technology and Computing and 100 on Diploma in Computer Science).
- Though staffing is still a problem, it has improved since the merger of the three institutions. Currently, The Department of Computer Science has 11 full time staff members and 1 part-time staff member. Four of these have masters degrees, three are on training for a master's degree, and four on PhD training under the Nuffic project II.
- Currently the Department of Computer Science has four computer laboratories one with 30, 40, 50 and 40 respectively.
- There are other 5 computers laboratories around the campus supplementing in the teaching of basic skills for all the university students.

Gulu University

- Has indeed experienced growth since the inception of the project. Two undergraduate programmes were begun as had been proposed at the start of the project: B.Sc. in Computer Science and Bachelor of Information Technology. The B.Sc in Software Engineering is planned to commence in August 2009. Plans are underway to begin Master of Science in Computer Science Programme.
- The capacity to run these programmes results from infrastructural developments that have been put in place such as two fully furnished computer Laboratories with 50 and 32 computers; printing and photocopying services.

- Gulu University (Department of Computer Science) currently has 198 students enrolled (73 on B.Sc. in CS, 72 on B.IT and 53 on Diploma in CS).
- The Department of Computer Science has a total of five (5) full time academic staff. One of the staff members is undertaking a PhD in The Netherlands under the Nuffic project, and two others undertaking PhD programmes at Makerere University.
- GU has successfully designed and adopted its ICT Policy and Master Plan.

5.3 Awards / Nominations for the UG Project Overall Coordinator / Project Leader (Linked to the Project)

Through the four Public Universities in Uganda, the project has extended the much-needed ICT support in terms of training and research not only to the academic community but also to the local communities in Uganda. This has put the four Public Universities in Uganda and specifically Makerere University Faculty of Computing University which is the coordinating institution in the South at the forefront of ICT innovations and service. Subsequently, Professor Venansius Baryamureeba who is the Dean of Makerere University Faculty of Computing and Information Technology and the Overall Coordinator / Project Leader was awarded / nominated for the following awards:

5.3.1 Presidential Science Awards 2008

Professor Baryamureeba received a 2nd Runners-Up Award for the Presidential Science and Technology Education Excellence Award at the Uganda Presidential Science Awards 2008. This event was organized by the National Council of Science & Technology, Uganda and it took place on 19th September 2008 at the Kampala Serena Hotel. This presidential award was in recognition of innovative approach to institutional and human resource capacity development in computer science.

5.3.2 'Top ICT Educator / Academic' Award in Africa for 2007

On 17th November 2007, Prof. Venansius Baryamureeba received the 'Top ICT Educator / Academic' Award in Africa for 2007 at a Gala Event at the Sandton Convention Centre, Johannesburg, South Africa. This event was organised by ForgeAhead and the South African Department of Communications, South Africa. The African Achievers who were given awards at this ceremony are those who have proven achievement in business excellence, innovation, entrepreneurship, or through having touched the lives of others who are less fortunate. They have also proven that their interaction continues to leverage ICTs to make a difference across Africa.

5.3.3 Nomination for Professional of the Year 2005 – British Council

This award was mainly for achievers and inspirational managers who have contributed to local as well as International communities. The project on 'Building a Sustainable ICT Training Capacity in four (4) Public Universities in Uganda' has contributed greatly to this achievement through the Project Overall Coordinator / Project Leader providing the services of mentorship, result oriented leadership, project coordination and management in an efficient and harmonious manner to the satisfaction of all parties involved.

5.3.4 Nomination for the 2005 presidential Science Award Cycle

The Uganda National Council for Science and Technology organized awards for professionals and institutions that have put in effort to integrate ICT for learning and for Building ICT Capacity in Higher Institutions of learning. The project on 'Building a Sustainable ICT Training Capacity in four (4) Public Universities in Uganda' has contributed greatly to this achievement in terms of extending ICT services to the Ugandan community and also spearheading ICT training, research and consultancy services in sub-Saharan Africa.

5.4 Florence Tushabe (Project Sponsored Ph.D Student) Receives 'The Best Student Paper' Award

Florence Tushabe, a female staff of Makerere University and Ph.D student at RUG won the best student paper award for her paper entitled, 'Image Preprocessing for Compression: Attribute Filtering' at the International Conference on Signal Processing and Imaging Engineering 2007, in San Francisco, USA.

5.5 Other Awards Since 2004 when the Project Began

Due to the support and facilitation the project has rendered to Makerere University, the Faculty of Computing and Information Technology (CIT) has demonstrated excellent teaching, research and consultancy services not only to Uganda but to the rest of the world. As a result, CIT has been honored with awards and nominations nationally and internationally in recognition of; commitment to quality, innovations, excellence, technology transfer and customer service. These include:

5.5.1 Best Cisco Regional Academy-East Africa 2008 - On 8th April 2008, Makerere University Faculty of Computing and IT (CIT) received the Best Regional Academy-East Africa 2008 from Cisco Systems. This award was handed over by the Cisco systems Regional Manager; Nevine Elkadi to the Faculty Dean, Prof. Venansius Baryamureeba who was the CIT Legal Main Contact of the academy. This was during the closing ceremony for the Cisco annual conference which was hosted by CIT. This award was given to CIT due to: high student enrollment every year; excellent support to the local academies; focus on student impact initiatives; high female enrollment figures and expanded academy curricula.

5.5.2 The International Quality Crown Award: Makerere University Faculty of Computing and IT was awarded 'The International Quality Crown Award 2007 in recognition of commitment to Quality, leadership, Technology and Innovation' September 2007 by Business Initiative Directions that focuses on building a better business reputation worldwide. This event took place in London and was presided over by Jose E. Prieto, President and CEO of Business Initiative Directions, along with outstanding personalities from business world and the diplomatic corps in the United Kingdom.

5.5.3 CIT Cisco Academy Won International Award: At the Cisco E&EM Academy Conference 2007, coinciding with the 10th anniversary of the Cisco Networking Academy program celebrations which were held at the Istanbul Teknik Üniversitesi in Istanbul, Turkey from 7 – 9 October 2007, Makerere University was hailed as the best Regional Academy of the year. The theme was strengthening community partnerships and Teamwork. Makerere University Faculty of Computing and Information Technology Cisco Academy was singled out from amongst other Academies in over 164 countries as the Regional Academy that has clearly contributed to the development of the program for the entire Europe and Emerging Markets (the latter comprising of Middle East and Africa).

5.5.4 Frances Baliza from Makerere University, Uganda was named student of the year: This was at the Cisco Academy Recognition Event, held at the Sait Halim Pasa Mansion, supported by Vice President Amy Christen, global head of the programme, and public sector VP Yvon Le Roux. Frances is a former Cisco Certified Network Associate (CCNA) student of CIT and an on-going Bachelor of Information Technology (BIT) student at CIT.

5.5.5 Regional Excellency Award, East Africa, 2007: Makerere University Faculty of Computing and IT was awarded for consistently maintaining highest student enrolment on CCNA in Africa, Consistently maintaining more

than 30% female on CCNA programme, over 2,700 CNNA 4 graduates, expanded Cisco Networking Academy Program and Excellent Communication.

5.5.6: CIT Produced 2 Best Students for the Convocational Award: Mr. Engineer Bainomugisha and Mr. Paul Ssekagya, former students of Bachelor of Science in Computer Science at Makerere University Faculty of Computing and IT received the Convocation Awards after emerging the overall best students with a CGPA of 4.85 and 4.88 respectively on a scale of 5.0 for the 56th and 57 graduation ceremonies held at Makerere University. The Convocation Award is awarded to the overall best student in the entire University each year at the graduation ceremony.

5.5.7 CIT Students Excelled at the IEEE 'ICT & Engineering Students Exhibition 2007' Exhibition: At this exhibition which took place in September 2007 in Nairobi, Kenya, 3 projects by CIT students were selected and won awards in different categories. A number of world class innovations were among the 122 entries of which 57 were in ICT, 34 in electronics and 31 in mobile technology - from 18 institutions in Bulgaria, Kenya, Malawi, Sudan and Uganda. The theme of the exhibition was "ICT in Rural Development".

5.5.8 The International Diamond Star Award for Quality in the Diamond Category: In April 2006 in Paris, France, Makerere University Faculty of Computing & IT was awarded "The International Star Award for Quality in the Diamond category". The award was in recognition of Excellence in Leadership and Business Management; Quality and Excellence; and Technological Innovations and Expansion. For further information: <http://www.bid-star.com/>

5.5.9 Highest Female Enrolment Award: In February 2006, CIT received an Award of \$10,000 for having the highest a admission of Female students on the Postgraduate Diploma in ICT Policy & Regulation which is a course resulting from a collaboration between Makerere University and NetTel@Africa. This award was used in procuring computer and reference sources to support the NetTel@Africa programmes in CIT (<http://www.nettelafrica.org/>).

5.5.10 International Arch of Europe Award for Quality and Technology in the Diamond Category: CIT, formerly Makerere University Institute of Computer Science and ICT Consults Ltd (which is a private ICT company comprising of highly qualified consultants from CIT) were selected by BID and JBAN (www.bid-euro.com) to receive the International Arch of Europe Award for Quality and Technology in the Diamond category in February 2005.

6.0 Assessment of the Project Approach (Strategy) on the Effectiveness and Efficiency - Highlighting the Risk Assumptions Made at the Start, the Bottlenecks, Recommendations and the Lessons Learned for Future Projects

6.1 Project Approach Strategy on the Effectiveness and Efficiency

6.1.1 Creation of a Coordination Committee in Uganda

For effective project coordination, a project coordination committee was formed consisting of the Overall Coordinator / Project Leader in Uganda as Chairperson, project sub-coordinators from all the four Public Universities, the Dutch Long Term Expert (Dr. Patrick Ogao) from 1st July 2005 until 30th June 2007 and a representative from each of the four Public Universities to supplement and strengthen coordination and project monitoring. This committee was also charged with overseeing project implementation in their respective Universities under the supervision of the Overall Coordinator / Project Leader.

6.1.2 Monthly Coordination Committee meetings

The coordination committee held monthly meetings in the four Public Universities on rotational basis. At every meeting a maximum of two members of top management and one academic staff member would be invited to participate whenever it was held at that particular University.

6.1.3 Involvement of Top Management Staff of the Four Public Universities, Private Universities and Other Stakeholders in Uganda

Top level management staff of the four Public Universities such as Vice Chancellors and Academic Registrars were involved and availed with information on the project through projects reports and minutes. Other stakeholders in Education, ICT and business were also involved in the project matters through participation in workshops and conferences organised under the project. This made the project results more relevant to the Public, meeting the demands of society.

6.1.4 UG-NL , NL-UG Leader missions

Under the project, Project Leader and Coordinators missions were planned for both the Northern and Southern Institutions. These missions were mainly to facilitate partners to discuss and design the project plan and implantation strategies.

6.1.5 Project Coordination Committee, The Netherlands

A project team in NL advised on the effective planning and implementation of project activities. This team consisted of the Board of the University of Groningen: the President, the Rector and the Vice-President, the Project Coordinator, the Dutch academic supervisor, the Dutch consortium representatives from the Dutch Team, which includes, next to the Dutch academic supervisor the following academics: Prof. Renardel de Lavalette (RUG), Prof. Dr. Erik Proper (RUN), Drs. Robert Janz (RUG Computing Centre) and Ing. Willem Benjaminse (HHG).

6.2 Table 22: Risk Assumptions and the Recommendations

Risk Assumptions	Recommendations
<ul style="list-style-type: none"> - All experts identified during proposal writing stage would be available during the entire project period. 	<ul style="list-style-type: none"> - Expert names should be tagged on missions in advance and made to commit to the mission regardless of the institutions they will be serving in at the implementation time of the said mission. This is more committing and makes mission follow up more manageable. - Project role assignment should be spread across the involved institutions not just at the coordinating centre. This increases project ownership and eases activity implementation.
Bottlenecks	Recommendations
<ul style="list-style-type: none"> - Lack of meaningful project formulation in line with budgeting leading to weak follow up on projects. - Lack of timelines in missions planning. - Delay of Procurements caused by bureaucracy in institutions. 	<ul style="list-style-type: none"> - Follow up of projects should be encouraged if critical – for the success, relevance and sustainability of the project supported. - Need for agreement on mission period between involved institutions for appropriate address of mission activities. - All Procurement activities should be done in the early phase of the project life to allow sufficient time to allow ample time for procurement procedures.
Lessons Learned: For Future Projects	
<ul style="list-style-type: none"> - There is need for clarity of project activities such as qualifications of mission experts; both project partners should be in agreement on such critical matters. - There is need for appreciation of change of needs during the project period, thus creating room for flexibility in implementation of project activities. - Realisation of the importance of Dutch and UG local quality inputs needed for project success such as quality of students and supervisors. 	

7.0 Conclusion

The NPT project 'Building a Sustainable ICT Training Capacity in the Public Universities in Uganda' was a great success. This success is attributed to the cooperation of the project partners both in Uganda and in the Netherlands. The support offered by the Institutions in the Netherlands was great. The project greatly impacted on the institutions in the South in a number of areas including but not limited to curriculum development, research development, human capacity development, Infrastructure development, gender balance promotion and in general institutional development.

Indeed the outputs of this project are enomuous. A Centre of Excellence for ICT Training and Research has been established at Makerere University, Faculty of Computing and Information Technology to address the human resource gaps within the tertiary institutions, the public and private sectors. The quality and quantity of the ICT human resource capacity in the Public Universities has been adequately improved; New and revised Bachelor, Master and Doctorate Programmes in ICT have been established; The already existing Research Capacity has been duly strengthened; Working Relations (cooperation) between the four Public Universities have been developed and/ or further strengthened and an acceptable gender balance amongst teaching staff and students has been achieved.

The approval and subsequent commencement of the Project 'Strengthening ICT Training and Research Capacity in the Four Public Universities in Uganda' from 1st June 2007 has added more meaning to the achievements of the project 'Building a Sustainable ICT Training Capacity in the Public Universities in Uganda'. This also concretises implementation of the Sustainability mechanisms.

8.0 Statement of approval

June 2008

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Prof. John Nerbonne
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9.0 Appendices

Appendix 1:	ICT Educational Needs Assessment
Appendix 2:	Report of the ICT Educational Needs Assessment
Appendix 3:	Proceedings of the ICT Stakeholder's Workshop
Appendix 4:	List of Staff Publications- Authors and Publication Titles
Appendix 5:	Inception Report of the ICT Policy and Master Plans for MUST
Appendix 6A:	Report of the ICT Policy and Master Plans for MUST, GU and KYU
Appendix 6B:	Report of the ICT Policy and Master Plans for GU
Appendix 6C:	Report of the ICT Policy and Master Plans for KYU
Appendix 7:	Report on Network and Infrastructure Assessments and Upgrades
Appendix 8:	Proceedings of the Higher Education Stakeholders' Workshop
Appendix 9:	Proceedings of the Closing Ceremony of Nuffic I
Appendix 10:	Mid-term Evaluation Report