

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



STRENGTHENING ICT TRAINING AND RESEARCH CAPACITY IN THE FOUR PUBLIC
UNIVERSITIES IN UGANDA

FINAL PROJECT REPORT

Period: 1st June 2007 – 31st May 2011

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

University of Groningen
Radboud University Nijmegen
Eindhoven University of Technology

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
KYU	Kyambogo University
MAK	Makerere University
MUST	Mbarara University of Science and Technology
NL	The Netherlands
RUG	University of Groningen
RUN	Radboud University Nijmegen
SE	Software Engineering
TUE	Eindhoven University of Technology
UG	Uganda

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PROJECT INFORMATION

1. **Location**
Four Public Universities in Uganda
2. **Project Name**
Strengthening ICT Training and Research Capacity in the Four Public Universities in Uganda
3. **Project number**
Uganda: UGA/238 (Party A)
Netherlands: UGA/245 (Party B)
Grant number: CF 4143
4. **Participating institutions**
Uganda:
Makerere University Faculty of Computing and IT (CIT) - **Lead Institution**
Mbarara University of Science and Technology (MUST)
Kyambogo University (KYU)
Gulu University (GU)

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5. **Project Period:** 1st June 2007 – 31st May 2011, budgetary extension until 31st July 2011
6. **Reporting Period:** 1st June 2007 – 31st May 2011
7. **Amount available from NPT programme:** EUR 5,700,000

1.0 PROJECT OVERVIEW

1.1 Introduction

The Project, 'Strengthening ICT Training and Research Capacity in the Four Public Universities in Uganda' was based in Uganda under The Netherlands Programme for Institutional Strengthening of Post-Secondary Education and Training Capacity (NPT) Programme. The lead institution in the South was Makerere University Faculty of Computing and Information Technology¹ (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; and Kyambogo University in the South and; Radboud University Nijmegen (RUN) and Eindhoven University of Technology (TUE) in the North.

The project was concerned with strengthening ICT training and research capacity within the education sector, one of the selected intervention areas of the NPT programme in Uganda. The project's aim was 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 in the field of ICT. The target group was university staff and students in the above institutions and ICT policy makers. The main activities required expertise from The Netherlands for support in educational programmes implementation, development of research capacity, training of staff of the four universities at PHD level in ICT either in The Netherlands or in Uganda; and strengthening of a center of excellence for computing and ICT training and research at Makerere University. Other activities included; development of ICT infrastructure at the four public Universities in Uganda, promotion of gender balance in staff and students population, and enhancing ICT awareness and promotion among the policy makers and the general public. The ultimate goal of the project was to enable the recipient institutions to contribute through ICT towards the national struggle for poverty alleviation, rural and economic development in Uganda.

The project was implemented in a period of four (4) years and it commenced on 1st June 2007. The maximum amount of the grant from Nuffic was 5,700,000 Euros and the period of the grant is from 1st June 2007 to 31st May 2011. The Southern Institutions contributed approximately 500,000 Euros in form of financial and material inputs such as complementary funding and equipment, physical infrastructure and human resource. Thus at the end of four years the project was worth at least 6,200,000 Euros.

¹ The Faculty name changed to Faculty of Computing and Informatics Technology in 2009 and later to School of Computing and Informatics Technology in 2010 in the College of Computing and Information Sciences following the transformation of Makerere into a Collegiate University.

1.2 Overall Objectives of the Project

The overall objective of the project is to strengthen the capacity of Makerere University Faculty of Computing and Informatics Technology, 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.

1.3 Specific Objectives of the Project

The specific objectives of the project are the following:

- a. To build a sustainable ICT human resource capacity at all the four public universities;
- b. To strengthen ICT educational programmes at the four public universities;
- c. To strengthen a joint (for all Public Universities) research programme;
- d. To improve the ICT and teaching infrastructure at the four public universities;
- e. To strengthen the centre of excellence in computing and ICT at Makerere University;
- f. 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 ICT/ science and technology;
- g. To strengthen relations and collaboration among the universities, ICT industry and the government.

1.4 Project Coordination Committee, Uganda

For effective project coordination, monitoring and peer evaluation, a project coordination committee was put in place as follows:

- **Chairperson-** Overall Project Coordinator/Project Leader in Uganda² (Prof. Venansius Baryamureeba) former Dean CIT and now Ag. Vice-Chancellor, Makerere University.
- **Members:**
 - Faculty of Computing and IT Dean (Dr. Josephine Nabukenya)
 - Faculty of Computing and IT Deputy Dean in charge of Graduate Studies and Research (Dr. Jude Lubega, Project Coordinator at Makerere University);
 - Director Institute of Computer Science at MUST (Ms. Theodora Twongirwe Mwebesa, Project Coordinator at MUST);
 - The Academic Registrar MUST (Mr. Stephen Bazirake)
 - Dean, Faculty of Science at Kyambogo University (Mr. Aaron Wanyama)

² In November 2009, Prof. Baryamureeba Dean Faculty of Computing and IT was appointed Ag. Vice-Chancellor, Makerere University. Subsequently CIT got a new Dean, Dr. Josephine Nabukenya. Since the NPT project is on institutional capacity building, the new Dean CIT was brought on board to be part of the project management team so as to sustain the already existing collaborations.

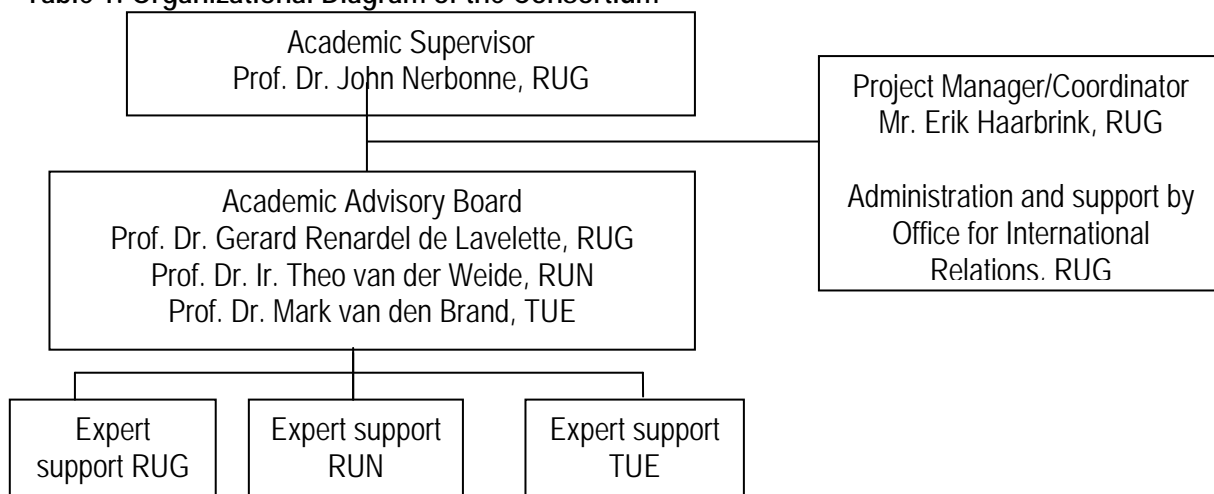
- Head of Department of Computer Science at Kyambogo University (Mr. Henry Matovu, Project Coordinator at Kyambogo University);
- Head Department of Computer Science at Gulu University (Dr. Geoffrey Andogah, Project Coordinator at Gulu University);
- Representative of the Dean, Faculty of Science at Gulu University (Assoc. Prof. Elizabeth Opiyo);
- Head, Corporate Relations Office at the Faculty of Computing and IT Makerere University (Mr. Michael Niyitegeka);
- Project's Financial Officer and Faculty of Computing and IT Accountant (Ms. Consolate Komugisha)- recorded in attendance;
- Project Secretary/Administrator and Registrar CIT (Ms. Peace Buhwamatsiko Tumuheki).

The committee met quarterly (every three months) and meetings were held at all the four public Universities on a rotational basis. The host university would invite at least one member of top management/Academic staff to the Project Coordination Committee meeting when it was being held at that particular university.

1.5 Project Coordination Committee, The Netherlands

Prof. Dr. John Nerbonne was the Overall Academic Supervisor of the project/ Chair Academic Advisory Board and was responsible for the overall progress and quality of the project. He worked closely with the Academic Advisory Board comprising of professors from the Dutch consortium: University of Groningen (Prof.Dr. Gerard Renardel de Lavelette); Radboud University Nijmegen (Prof. Dr. Ir. Theo van der Weide); and Eindhoven University of Technology (Prof. Dr. Mark van den Brand). The Board advised the Academic Supervisor on PhD research issues and other academic affairs, and mobilized staff from their institutions for project activities. The Academic Supervisor and the Academic Advisory Board received assistance for coordination of all day-to-day project affairs from the project management team at the Office for International Relations of RUG headed by Mr. Erik Haarbrink, Project Coordinator, assisted by Ms. Gonny Lakerveld. The Project Coordinator took responsibility for regular liaison between the Ugandan and Dutch partners. The office for International Relations coordinated all project administrative and financial matters for the project team, and acted as the liaison with Nuffic for the Dutch consortium.

Table 1: Organizational Diagram of the Consortium



1.6 Executive Summary

All the project activities and objectives were completed except for the continuing 10 PhD students in the Netherlands and 19 PhD students in Uganda. One of the PhD candidates- Paul Muyinda Birevu already completed his training and graduated in January 2010. About 6 students studying at Makerere University are expected to finish in 2011, 20 in 2012 and 3 in 2013. The table below shows the summary of level of achievement of the specific objectives of the project since the project started on 1st June 2011.

Table 2: Summary of Achievements [1st June 2007- 31st May 2011]

Sn	Specific Objective	Expected Output	Progress
1	To Build a Sustainable ICT Human Resource Capacity at all the Four Public Universities;	By 2011, ten (10) members of staff (1 from Gulu University, 1 from Kyambogo University, 2 from Mbarara University of Science and Technology and 6 from Makerere University) will obtain PhD Degrees in ICT disciplines from the institutions (s) in The Netherlands.	<p>10 members of staff from the four public universities were awarded PhD scholarships to study in The Netherlands as follows:</p> <ul style="list-style-type: none"> • GU- 1 • KYU-2 • MUST-2 • MAK- 5 <p>In 2007 all the 10 undertook a 2 months research exposure visit to Institutions in NL</p> <p>All the 10 above are progressing well.</p> <p>✓ 100% on recruitment and progress</p>
		By 2011, twenty (20) members of staff (3 from Gulu University, 2 from Kyambogo University, 3 from Mbarara University of Science and Technology and 12 from Makerere University) will obtain PhD Degrees in ICT disciplines from	<p>20 members of staff from the four public universities were awarded PhD scholarships to study at Makerere University. The distribution is as follows:</p> <ul style="list-style-type: none"> • GU-1 • KYU-1 • MUST-3 • MAK- 15 <p>✓ 100% on recruitment</p> <p>✓ On progress, 1 student has completed, 6 are expected to complete in 2011, 10 in 2012 and 3 in 2013.</p>

		<p>Makerere University.</p> <p>Each of the 20 Ph.D. Students will have three short research visits of two months to an institution in The Netherlands during the four years of the project.</p> <p>Purchasing 30 laptops for PhD students.</p>	<p>In 2007, 18 of the 20 members of staff awarded PhD scholarships to study at Makerere University had a 2 months research exposure visit to NL [October – December '07].</p> <p>In 2008, only 12 of the 20 students had their research visits to Institutions in NL. 6 students did not take their research visits because they did not meet the minimum requirements (did not show commendable progress) and other 2 undertook research visits in other Institutions.</p> <p>In 2009 10 students had research visits of 2 to 6 months at all the three institutions in NL.</p> <p>UG PhD students not based at Makerere (7) received Internet connectivity to facilitate regular contact with their supervisors.</p> <p>In 2010, 12 students have had research visits to the institutions in NL</p> <p>All the 30 PhD students were given laptops to facilitate their PhD training.</p> <p>✓ 100% complete</p>
2	To Strengthen ICT Educational Programmes at the 4 Public Universities;	<p>By 2011, Ugandan lecturers will have acquired better methods of teaching and course delivery.</p>	<p>In 2007, the first Quality Assurance workshop was held from 2nd to 4th November '07 at Colline Hotel Mukono.</p> <p>In 2008, the 2nd Quality Assurance workshop was held from 4th-6th September 2008 at Colline Hotel Mukono</p> <p>In 2009, the Quality Assurance workshop was held at each of the 4 universities as follows:</p> <ul style="list-style-type: none"> • Makerere- 21st May 2009, 27th August 2009 • MUST- 2nd -3rd July 2009 • Gulu- 7th to 10th August 2009 • Kyambogo- 19th December 2009 <p>In 2010, the fourth Quality Assurance workshop was held at Lake Victoria Hotel, Entebbe on 1st July 2010.</p> <p>4 out of 4 workshops held</p> <p>✓ 100% on completion</p>
		<p>By 2011, Ugandan Lecturers will have gained the competency to teach courses delivered by the</p>	<p>In 2007, there were no missions by Dutch experts to Uganda.</p> <p>In 2008 4 teaching missions from Dutch experts were delivered in Uganda, combined with research activities.</p> <p>In 2009, 8 teaching missions (combined with research activities) from Dutch experts were delivered in</p>

		Dutch experts.	<p>Uganda.</p> <p>In 2010, 9 teaching missions (combined with research activities) from Dutch experts have been delivered in Uganda.</p>
		By 2011, the competencies of the graduates from the public Universities completing degree programmes supported by the project will be comparable to those of graduates from similar programmes in the Northern Institutions.	<p>In June 2008, CIT Students competed in the Microsoft Regional Imagine Cup 2008 Competition held at the Hilton Hotel, Nairobi, Kenya and won the Winner and 2nd Runner up positions.</p> <p>In September 2008, CIT students competed in the 10th IEEE students Exhibition 'ICT and Mobile Applications Category' in Nairobi and won the Winner and 2nd Runner up positions.</p> <p>In 2009 the Development++ team composed of CIT students excelled in the Design for Development Award Software Design category that competed in the 7th Imagine Cup 2009 World Finals in Cairo, Egypt from July 3-7, 2009.</p> <p>For the 3rd Year running, the winning team of the East African Microsoft Imagine Cup 2010 Competition came from CIT. The winning team represented the region at the Imagine Cup 2010 World Competition finals held in Warsaw, Poland from July 3 - 8, 2010. Three other teams from the Faculty were among the best top five in the region and received various prizes, including a laptop, a desktop computer and mobile phones.</p> <p>Paul Muyinda Birevu one of the PhD beneficiaries of Nuffic II was the overall winner of the Uganda Communication Commission best postgraduate researcher of the year 2010 award. He is due to graduate in January 2011</p>
		By 2011, the performance objectives of the degree programmes supported by the project will be comparable to those at the Northern Institutions.	<p>There is continuous improvement in the quality of our graduates, curricula and facilities in all the Universities</p> <p>Universities carry out Self Assessments at Departmental level and are involved in Peer external programme evaluation set by the Inter University Council for East Africa.</p> <p>As per the Webometrics rankings of July 2010, Makerere University is now the top most university in Africa outside South Africa and Egypt.</p> <p>CIT is perceived to be among the top 3 Computing Faculties in Africa.</p>

		By 2008, the status of former ICT graduates including their employment status and a Tracer Study report will be in place.	In 2007, Terms of Reference were drafted and the activity was extended to 2008. The tracer study-advert came out on 8 th December 2008. In 2009, The final tracer study was carried out and a report was submitted in November 2009
3	To Strengthen a Joint (for all Public Universities) Research Programme;	By 2011, at least 120 papers (30 papers per year) will be published in refereed international journals and books.	In 2007, a total of 61 papers were published of which 16 were in Journals; 29 as Book Chapters; and 16 as Conference Proceedings. In 2008, a total of 63 papers were published of which 22 are in Journals; 21 as Book Chapters; and 20 as Conference Proceedings. In 2009, a total of 30 papers were published of which 8 are in Journals; 22 as Book Chapters; and 10 as Conference Proceedings. In 2010, a total of 23 papers have been published of which 6 are in Journals and 17 are Book Chapters. ✓ 177 publications are in place already ✓ Over 100% on completion
		By 2011, four (4) International Conferences on Computing and ICT Research Proceedings books would have been produced.	In 2007, the 3 rd annual international conference on Computing and ICT Research was held from 5 th to 8 th August 2007. http://cit.mak.ac.ug/iccir/ In 2008, the 4 th annual International conference on Computing and ICT Research (ICCIR'08) was held from 3 rd -5 th August. http://cit.mak.ac.ug/iccir/ In 2009, the 5 th annual International conference on Computing and ICT Research (ICCIR'08) was held from 2 nd -4 th August. http://cit.mak.ac.ug/iccir/ In 2010, the 6 th annual International conference on Computing and ICT Research (ICCIR'08) was held from 1 st -4 th August. In 2007, One Book 'Special Topics in Computing and ICT Research Vol.3' was published and is available freely at CIT in electronic form (CDs) and online' http://cit.mak.ac.ug/iccir/ In 2008, One Book 'Special Topics in Computing and ICT Research Vol. IV' was published and is now available freely at CIT in electronic form (CDs) and online' http://cit.mak.ac.ug/iccir/ In 2009, One Book 'Special Topics in Computing and ICT Research Vol. 5' was published both in electronic form (CDs) and online' http://cit.mak.ac.ug/iccir/ In 2010, One Book 'Special Topics in Computing and

		<p>ICT Research Volume VI, ISBN 978-9970-25-015-8 was published both in electronic form (CDs) and online' http://cit.mak.ac.ug/iccir/</p> <p>In 2007, 5 members of staff from the 4 public universities were facilitated to attend and present papers at international conferences (outside Uganda).</p> <p>In 2008, 10 members of staff from the 4 public universities were facilitated to attend and present papers at international conferences (outside Uganda).</p> <p>In 2009, 5 members of staff from the 4 public universities have been facilitated to attend and present papers at international conferences (outside Uganda).</p> <p>In 2010, 8 members of staff from the 4 public universities have been facilitated to attend and present papers at international conferences (outside Uganda).</p> <ul style="list-style-type: none"> ✓ 4 conferences out of 4 have been held ✓ 4 ICT Research Proceeding Books have been published in series ✓ 100% complete
	<p>By 2011, at least eight (8) issues of an International Journal on Computing and ICT Research would have been produced.</p>	<p>In 2007, 2 issues of the journal were published. Volume 1 issues 1 in June 2007 and volume 1 issues 2 in December 2007. The June issue had a collection of ten (10) papers and the December issue had a collection of eight (8) papers.</p> <p>In 2008, 3 issues were published. Volume 2, Issue 1 and 2 were published in June and December 2008 respectively. The June issue had a collection of six (6) papers and the December issue had a collection of nine (9) papers. In addition to the two issues a special issue was published in October 2008 to cater for the best papers (9) presented at the Annual International Conference on Computing and ICT Research (ICCIR'08).</p> <p>In 2009, 3 issues were published. Volume 3 issue 1 was published in June 2009 with a collection of 8 papers. Volume 3 Issue 2 was published in December 2009 with a collection of 7 papers. A special issue was published in October 2009 with a collection of 9 papers presented at the Annual International Conference on Computing and ICT Research (ICCIR'09).</p> <p>Visit http://www.ijcir.org/home/</p> <p>In 2010, 3 issues were published. Volume 4 issue 1 was published in June 2010 with a collection of 6 papers. Volume 4 Issue 2 was published in December 2010 with a collection of 5 papers. A special issue was</p>

		<p>published in October 2010 with a collection of 8 papers presented at the Annual International Conference on Computing and ICT Research (ICCIR'10). Visit http://www.ijcir.org/home/</p> <p>The IJCIR has received a new status of being included in the prestigious EBSCO database</p> <p>✓ 11 issues have been published</p> <p>✓ Over 100 % completion</p>
	<p>By 2011, twenty (20) experienced Ugandan Researchers (non-students) (5 per year) would be in place as result of Dutch Experts mentoring.</p>	<p>In 2007 and 2008, 7 Ugandan researchers visited institutions in NL.</p> <p>In 2009, so far 5 Ugandan researchers visited institutions in NL.</p> <p>In 2010, 5 Ugandan researchers have visited institutions in NL</p> <p>In 2008, 9 Dutch researchers visited Institutions in Uganda and as a result 17 PhD holders were mentored</p> <p>In 2009, 7 Dutch researchers visited Institutions in Uganda.</p> <p>In 2010, 7 Dutch researchers have visited Institutions in Uganda with two of them coming for 2 missions.</p> <p>✓ 100% complete</p>
	<p>By 2008 a joint research program with researchers from the Universities, ICT Industry and Policy Makers shall be in place and this program is expected to last 4 years. At the end of each year, a joint research dissemination workshop will be organized (See results on collaboration among the universities and ICT Industry and the Government).</p>	<p>In 2007, the first Modern University and Research Management Workshop was held from 23rd to 25th Nov'07 at Colline Hotel Mukono</p> <p>In 2008, the 2nd Modern University and Research Management Workshop was held from 16th -18th October 2008 at Colline Hotel Mukono.</p> <p>In 2009, the Modern University and Research Management workshop was held at each of the 4 project universities as follows:</p> <ul style="list-style-type: none"> • MUST- 9th July 2009 • Makerere- 28th August 2009 • Gulu- 7th October 2009 • Kyambogo- 18th December 2009 <p>In 2010, the 4th Modern University and Research Management workshop was held on 2nd and 3rd July 2010 at Lake Victoria Hotel Entebbe</p> <p>✓ 4 out of 4 workshops held</p> <p>✓ 100% complete</p> <p>Makerere University Faculty of Computing and IT is collaboratively implementing the national research agenda with government departments such as</p> <ul style="list-style-type: none"> • National Information Technology Authority

			<p>NITA (U)- Directorate of Research and Development</p> <ul style="list-style-type: none"> • Ministry of ICT- Directorate of Research and Development • Uganda Communications Commission (UCC)- department of Research and Development • National Council of Science and Technology (NCST)-Department of Research and Development • Uganda National Research Institute (UNRI)- Department of Research and Development
		<p>By 2008 there will be strengthened contract research (research partnerships with the private and public sectors).</p>	<p>In 2007, informal Interactions were held between Universities and the Private Sector and Public Sectors over possible future collaborations (ICT incubation Projects).</p> <p>In 2007, a Memorandum of Understanding was signed between CIT and Uganda Police Force on 21st December 2007.</p> <p>In 2008, CIT received a tremendous response with regard to collaborations with the Private Sector.</p> <p><u>MAK:</u></p> <ul style="list-style-type: none"> • A Joint Digital Laboratory was set up at CIT • A National Software Incubation Centre was set up and trained 100 incubatees • Collaboration with Nokia Mobile, HP, Google, IBM, Microsoft, Newvision, Rhodes University, South Africa on Firefox Mozilla Translation, The Council for Scientific Industrial Research (CSIR)-Meraka Institute, East African Business Week, FAST Scanning, D-Mark Mobile Ltd, Yo Uganda Ltd, Jobs ICT Bangladesh, Centre for International E-Governance Solutions Ltd, State University of Zanzibar, Government of Mauritius- First Exec Company, Uganda Peoples Defense Forces, Uganda Police Force, <p>In 2009, more collaborations were on board as follows:</p> <ul style="list-style-type: none"> • Dell Academy, Enterprise Uganda, MTN Uganda, Zain Uganda, Igongo Cultural Center, Ministry of Foreign Affairs, Government of Uganda, Ministry of Health. Government of Uganda, Partners under OMEVAC e.g University of Bergen, Amity University, University of Hertfordshire,

			<p>International Telecommunications Union (ITU), Orange, SAP Inc, and EMC Inc.</p> <p><u>MUST</u></p> <ul style="list-style-type: none"> • Collaboration between MUST and MTN • Collaboration between MUST and URA <p><u>GU:</u></p> <ul style="list-style-type: none"> • A GIS Lab was set up at Gulu University in collaboration with USAID and Wild Life Conservation Society. <p>In 2010, more collaborations are on board as follows:</p> <p><u>MAK:</u></p> <ul style="list-style-type: none"> • Google, British Council, Digimation, TASO, PACE, Kampala District Private Educational Institutions Association, TATA, Human IT (Karlstad University), Orange Uganda, Ministry of Foreign Affairs, UPDF, UPF, University of Hertfordshire. <p><u>MUST</u></p> <ul style="list-style-type: none"> • Collaboration with Uganda Police Force and Mbarara Municipal Council <p><u>GU:</u></p> <ul style="list-style-type: none"> • Collaboration with Microsoft <p><u>KYU:</u></p> <p>Collaborations with Afroeducare Uganda Ltd, Hi-tech Systems and Millennium Science Initiative</p> <p>✓ 100% complete</p>
		By 2008, 70 computers and UPS will have been purchased to support researchers at the four public Universities.	<p>All equipment for research staff at the four public Universities were procured, delivered and distributed to the respective Universities as follows:</p> <p>MAK- 40 laptops MUST- 10 laptops KYU- 10 laptops Gulu- 5 laptops & 5 desktop computers.</p> <p>✓ 100% completed</p>
4	To Improve the ICT and Teaching Infrastructure at the Four Public Universities;	By 2007, a networked computer laboratory of 1000 computers will be in place at Makerere University Faculty of Computing and IT; a networked computer	<p>All equipment was delivered and installed at the four public Universities. The 1150 computers were divided into 855 Desktops (including 5 computers for Gulu research staff) and 300 Thin clients and distributed as follows:</p> <ul style="list-style-type: none"> • MAK- 700 desktops and 300 Thin Clients • MUST- 50 desktop computers • GU- 50 desktop computers • KYU- 50 desktop computers <p>1150 UPS (800 Small UPSes (750Va and Two Heavy</p>

		laboratory of 50 computers will be in place at each of the other universities (MUST, Kyambogo and Gulu).	Duty (10KVA) were delivered distributed among the four Universities. ✓ 100% completed
		By 2007, four (4) interactive white boards and 4 projectors will have been procured for distribution equally to the four public universities.	Four interactive white boards and 9 projectors were procured and distributed among the Universities as follows: <ul style="list-style-type: none"> • MUST- 1 whiteboard and 1 projector • GU- 1 whiteboard and 1 projector • KYU-1 whiteboard and 1 projector • MAK- 1 whiteboard and 6 projectors 6 projectors were procured for Makerere University to cater for the GIS lab (1), Multimedia lab (1), 300 seater Thin Clients lab (1) and for the 700 seater lab (3). ✓ 100% completed
		By 2009, at least 2000 (academic) staff will have trained in ICT skills.	In 2007, no ICT training workshops were conducted. In 2008, All the 4 Universities conducted ICT Training Workshops for their staff as follows: <ul style="list-style-type: none"> • MAK: E-Learning training took place on 18th and 19th August 2008. Basic Training in ICDL of 1000 Makerere staff was held between the months of September and December 2008. • MUST: 200 staff were trained from 14th May 2008 up to 30th June 2008. • GU: 51 staff were trained from 14th – 28th April 2008. • KYU: 82 staff were trained from 1st-15th September 2008; In 2009 more ICT skills training for staff were done as follows <ul style="list-style-type: none"> • GU- Other 49 were trained from 19th -20th January 2009 • KYU- more 25 staff were trained in ICDL from 9th to 20th February 2009 bringing the total to 107. • MUST- Other 30 were trained on 4th December 2009 In addition, Pedagogical skills training workshops were held at MUST, Busitema and Makerere Universities. By the end of 2009 a total of 1437 academic staff had been trained.

			<p>In 2010 more 50 staff were trained at Mbarara University of Science & Technology in the months of November and December.</p> <p>✓ 74% complete</p>
5	To Strengthen the Centre of Excellence in Computing and ICT at Makerere University;	By 2007 a Desktop Publishing Unit will be in place to enable publication of handbooks, proceedings books, books including theses and dissertations, journal issues, fliers, news paper supplements, reports e.g. annual reports and workshop/ project reports etc.	<p>This item was under-budgeted and has been put on hold due to lack of sufficient funds.</p> <p>100% funds required for this unit are being sought from other sources.</p>
		By 2007 an advanced Multimedia laboratory that will support innovation and research in multimedia technology and applications will be in place.	<p>Equipment was procured. Laboratory fully operational.</p> <p>✓ 100% completed</p>
		By 2007 an Advanced Geographical Information Systems (GIS) laboratory to be used for scientific investigations, resource management, asset management,	<p>Equipment was procured. Laboratory fully operational.</p> <p>✓ 100% completed</p> <p>In addition, Using 10 computers from the students' laboratory provided by Nuffic, Gulu University set up a GIS lab in the Department of Computer Science, Faculty of Science in collaboration with the Wild Life Conservation Society (WLCS). The lab has the following equipment: 10 computers and UPS', map Plotter, a scanner, a printer and four GPS sets.</p>

		Environmental Impact Assessment, Urban planning, cartography, criminology, sales, marketing, and route planning will be in place.	
		By 2007 the floor to house the Centre of Excellence on the new Faculty of Computing and IT Building under construction will be completed and furnished.	<ul style="list-style-type: none"> • Furnishing of the floor for the Centre of Excellence was completed. • Network installations were done and LAN is fully operational. ✓ 100% completed In 2010, MUST has successfully set up a Computer Engineering Laboratory to support teaching of Bachelor of Science in Computer Engineering programme.
6	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 ICT/ Science and Technology;	By end of 2007, at least 40% of the PhD training scholarships will be filled by the female academic staff.	Out of the 29 continuing PhD Students, 14 are female [48.27%]. The percentage of female academic staff studying in NL is 50% whereas that for Uganda is 40%. ✓ 100% completed
		By 2008, good policies on gender will be in place at the four public Universities	A Gender Awareness and Promotion Strategy is in place to guide Universities in implementation of this activity. ICT Staff at Universities are actively participating in gender policy dialogues at national level. Makerere University has in place an anti sexual Harassment Policy which protects both students and staff.
		By 2009, gender will have been mainstreamed in teaching and research at the public Universities	<u>MAK:</u> Number of female graduates has increased steadily and females equally compete in performance at CIT. Gender in ICT is one of the courses taught in the computing programmes at the universities. Every research group has at least one female PhD holder or female PhD student. This will to influence the research agenda in the faculty. <u>MUST:</u> 50% of Lecturers in the Institute of Computer Science

			<p>at MUST are females.</p> <p><u>KYU and GU:</u> The female-male staffing ratio at the two Universities is also improving.</p>
		<p>By 2011, reports on good practices on gender awareness and promotion, and gender and ICT will be in place.</p>	<p><u>MAK:</u> Gender Promotion Strategy is in place 2009: 600 women were trained in basic ICT skills between May and August 2009 In 2010, 7 female PhD students on the project were given funds to undertake projects in empowering women and papers are/have been written out of these projects.</p> <p><u>MUST:</u> Brochures on this activity are in place. In November 2008, gender promotion and awareness was conducted in fifteen (15) schools in the districts of Mbarara, Ntungamo, Isingiro, Ibanda, and Bushenyi. A report by MUST on Gender Awareness Promotion in Secondary Schools is in place. In 2009, MUST carried out 2 activities aimed at promoting gender balance. In 2010, gender promotion at MUST was done through Media Promotions, School Visitation Projects, and developing a model of "Promoting innovative start-up (incubator) projects for women as ICT entrepreneurs". More women (entrepreneurs) were trained in basic ICT skills.</p> <p><u>GU:</u> Training of women in and around Gulu in ICT Awareness was held for 2 weeks beginning on 11th August 2008. 2009: More 46 female secondary school teachers, LCV Women Councillors Police and Prisons Female Officers in Gulu district was done for two weeks from 1st to 15th July 2009 In 2010, ICT Survey and ICT Seminars in 23 Girl's/Mixed schools in Northern Uganda were done in October 2010 ICT Skills Training for High School Girl's in Gulu Municipality in November 2010</p> <p><u>KYU:</u> In the period 26th October – 25th November 2009 KYU carried out an ICT sensitization campaign in 5 districts of Uganda. Also distributed Department of computer science brochures to all schools visited. In November 2010, the Department of Computer</p>

			Science run an essay competition in selected girls schools in five districts of Uganda on topics such as ICT in Education, ICT in Health.
		By 2011 there will be a likely improvement in male: female staff ratio at the public universities as a result of the good gender policies and affirmative action.	<p><u>MAK:</u></p> <ul style="list-style-type: none"> • Dr. Josephine Nabukenya is the Dean CIT • Dr. Agnes Rwashana is the Head Department of Information systems • Dr. Florence Tushabe is the head Department of Information Technology • Dr. Julianne Sansa Otim is the Head Department of Networks • 47% of females teaching at CIT are females. • Out of 5 service departments in CIT, 3 are headed by females. <p><u>MUST:</u></p> <ul style="list-style-type: none"> • The Director Institute of Computer Science at MUST is a female -Ms. Theodora Mwebesa Twongirwe. • 50% of Lecturers in the Institute of Computer Science at MUST are females. <p><u>KYU and GU:</u></p> <p>The female-male staffing ratio at the two Universities is also improving.</p>
		By 2011, the number of female students on ICT/ Science and Technology programmes is likely to have improved as a result of the gender awareness and promotion programs targeting primary and secondary school leavers (prospective University students).	<p>Efforts have been directed towards attracting quality students to ICT programmes through running News paper supplements and publishing ICT Awareness Brochures. Radio talk shows have also been held.</p> <p>For 2008, open days were held as follows:</p> <ul style="list-style-type: none"> • Makerere held a 2 day open day event on 8th and 9th August • MUST held an open day on 31st October <p>For 2009:</p> <ul style="list-style-type: none"> • Makerere- 21st and 22nd August • Gulu- 29th October • MUST- 28th November <p>For 2010, open days were held as follows:</p> <ul style="list-style-type: none"> • Makerere- 20th and 21st August • Gulu- 20th- 24th September • MUST- 27th November <p>The performance of female students in ICT programmes is equally good For instance at CIT the two best performing students in BSc Computer</p>

			Science were females: Nansamba Barbara and Nakacwa Barbara Wamala who got CGPA of 4.90 and 4.89 respectively and Oduor O. Magdaline who got CGPA of 4.60 on the Bachelor of Information Technology Programme. The three students are due to graduate in January 2011.
		By 2011 the ICT departments/ institutes/faculties will have positively influenced gender policy at national level	ICT Staff at Universities are actively participating in gender policy dialogues at national level. For a policy to be passed it must have a gender component integrated in its operations.
7	To Strengthen Relations and Collaboration Among the Universities, ICT Industry and the Government .	By 2011 at least 80% of the ICT advisors on Government projects will be from the Universities.	<p>In 2007, the first Consultative workshop on ICT Training and Research Partnerships in Uganda was held on 18th Dec 2007 at Serena hotel, Kampala. For 2008, the 2nd Joint research dissemination and consultative workshop was held on 5th December 2008 at Grand Imperial Hotel, Kampala. 25 projects were exhibited at the workshop by students from Makerere University, Kyambogo University, Gulu University and Mbarara University of Science and Technology.</p> <p>For 2009 Makerere and Kyambogo held a Consultative breakfast meeting on 20th November. MUST held a consultative workshop on 8th July 2009 Gulu held a consultative workshop on 8th December 2009</p> <p>In 2010, the third joint Consultative workshop on ICT Training and Research Partnerships in Uganda was held on 10th December at Protea Hotel Kampala. MUST held a Visibility Strategy workshop in October 2010 at which a team of champions (staff) was enacted and these will be working out the Visibility Strategy of the University. A follow up workshop for a team of key faculty representatives was held on 12th November 2010 to look at the draft strategy.</p> <p>CIT is already advising government, on ICT related matters. The Faculty has been invited and consulted on several occasions on the same. CIT provided technical advice on ICT to the President of Uganda at a conference in Ethiopia between 31st January and 2nd February 2010.</p> <p>Public universities are represented at every single ICT and related meetings held in the country. CIT has been</p>

			represented at several international meetings. The public Universities are becoming points of reference in their respective locations and they provide expertise especially in ICT related matters.
		By 2011 more than 50% of the ICT consultancies will be undertaken by local experts either from the Universities or the private sector	<p>There is sufficient local ICT expertise created in the Universities, government and the private sector. Most of the experts in the government departments have been trained by CIT which has enhanced the working relations with the public universities.</p> <p>CIT is already undertaking consultancy projects and providing expertise to government and other universities. CIT has partnered with the government of Uganda to provide Business Process Outsourcing (BPO) training to over 3000 selected applicants. The capacity built at Makerere University is being spread to other Universities.</p>
		By 2011 there will be at least 10 spinoff companies from ICT incubation centres based at Universities	<p>The National Software Incubation centre was set up at CIT in 2008 and as a result spin off companies by graduates have been set up. In 2008 4 Spin-Off Companies were started by the Incubation Centre graduates. The centre graduates 100 software developers every year. As these students graduate more spin off companies will be created. The centre works hand in hand with the Department of Innovations and Software Development to support the graduates start off companies.</p> <p>Different collaboration projects are being/have been undertaken by students from CIT. These projects will later be taken up by the companies and revenue sharing models will be agreed upon between the students and the companies.</p>
		By 2011 value addition on research outputs would have tremendously improved.	A Joint Digital Laboratory has been set up at CIT with support from Nuffic, Google, Nokia, HP and Dell. Prospects of more partners getting on board are very high as several proposals continue to be received.
		By 2011 there will be strengthened cooperation and collaboration between ICT	North-South collaborations have taken off with strengthened collaborations between the north and south researchers. There is also strengthened cooperation between the public universities in Uganda. Joint degree programmes are running

		academic institutions in The Netherlands and in Uganda and between the four public universities in Uganda.	between the public universities as well as staff exchange programmes.
		By 2011 commendable funding from the private sector to the Universities' programs will be in place.	Joint projects with the private sector are already in place where the private sector is providing support both monetary terms and in kind. More proposals have been received where there will be cost-sharing between Universities and private sector companies.
		By 2011 collaborative research projects funded by the private sector will be in place.	Collaborative research projects funded by the private sector are already in place at the public universities e.g. at Makerere university 'Using State-of-the-art Wireless and Mobile Technologies to Deliver Mobile Computing Courses' project funded by HP, the "Mobile Computing, Networking and Application software development project" supported by Google, "the Machine Learning Techniques for Prediction of Cholera Outbreaks" supported by IBM among others. MUST Institute of Computer Science wrote a joint proposal with the Medical School on Community Outreach and MTN provided 15,000 USD for the same. The Department of Computer Science at Gulu University was selected as a Microsoft Academy Centre The Department of Computer Science at Kyambogo University won a grant from Millennium Science Initiative in regard to enhancing the capability of science and mathematics teachers to use ICTs in teaching
		By 2011 more ICT jobs will be in place.	Due to a conducive investment climate the number of telecommunication companies has gone up and more are getting on board. Those already operating include UTL, MTN, Airtel, Warid and Orange. These have increased the employability index in the ICT sector in Uganda. The government of Uganda in collaboration with CIT is committed to establishing call centers in different parts

			<p>of the country which will provide employment to the ICT graduates.</p> <p>Spin off companies started by graduates of the National Software Incubation Centre will also create more jobs.</p>
		<p>By 2011 delivery of government services will have improved as a result of the collaboration among the government and the Universities and the private sector.</p>	<p>CIT signed an MoU with the Uganda Police Force to enable the Force improve its service delivery. CIT trained police officers in Office Applications using the CCA course content from 21st July -1st August 2008. From 15th – 26th September 2008 CIT provided training in basic ICT skills to 120 Uganda Peoples Defense Forces Army officers. 2009: More collaborations on board Collaboration between Makerere University-CIT (on behalf of Government of Uganda) and the Government of Burundi.</p> <p>In 2010, CIT accomplished a project with Uganda Police. This project involved developing a Human Resource System that should help the Force account for all their Police constables by click of a button. The system was deployed in November 2010 and will be commissioned in February 2011.</p> <p>CIT also trained more 100 Police officers in Computer Applications Skills in October 2010.</p> <p>CIT also accomplished a project with Ministry of Foreign Affairs. This project related to converging all government foreign missions into one location through one umbrella called www.mofa.go.ug. This web portal will help store, manage and disseminate all foreign missions information more effectively than has been the case previously. The portal was developed tested, deployed and will be commissioned in February 2011. Mapping Crime Project -GIS Training of Police Officers and army officers was held in October 2010 at MUST.</p> <p>Mbarara portal was developed and launched on Friday 12th November 2010. In addition, the Institute of Computer Science has been contracted by the Mbarara Municipal Council to develop a tool that will support them in activity planning and weekly management reporting.</p>

2.0 DESCRIPTION OF THE PROJECT ACTIVITIES [1ST JUNE 2007 – 31ST MAY 2011]

2.1 Component IP: Inception Phase

2.1.1 IP 1: Coordination and Management Mission to Uganda

Prof. John Nerbonne (Overall Academic Supervisor) and Mr. Erik Haarbrink (Project Coordinator) visited Uganda shortly after the start of the project (6th- 14th June 2007). The mission basically addressed the organization of the project, the plan of operations and the activities for 2007. During their visit they held meetings with Prof. Livingstone Luboobi, the Vice-Chancellor Makerere University, Prof. Baryamureeba, Dean CIT and prospective PhD Students from all the four public Universities and CIT Academic Staff and Researchers. They also visited Mbarara University of Science and Technology and Kyambogo University where they held meetings with the Vice-Chancellors and Academic Registrars to discuss project related issues.

2.1.2 IP 2: Academic Advisory Board Mission to Uganda

The Dutch Academic Advisory Board visited Uganda from 24th – 31st August 2007. The Board consisted of Prof. Dr. John Nerbonne, Chair (RUG), Prof. Dr. Gerard Renardel de Lavelette (RUG), Prof. Dr. Mark van den Brand (TUE), Prof. Dr. Ir. Theo van der Weide (RUN) and Prof. Dr. H.A. Erik Proper (RUN). The purpose of the mission was to interview candidates for the PhD Scholarships. The interviews were held from 27th-29th August 2007. During their visit they also held meetings with the Co-Supervisors at Makerere University; the Overall Project Coordinator and the Project Coordinator from Kyambogo University. Meetings with coordinators from MUST and Gulu University were planned but unfortunately could not take place.

2.1.3 Launching of the NPT Project

Launching of the Project 'Strengthening ICT Training and Research Capacity in the Four Public Universities in Uganda' was held on 27th August 2007 at Makerere University Faculty of Computing and IT. The Guest of Honor was the Commissioner for Higher Education, Mrs. E.K.M Gabona. Other Invited Guests were: The Netherlands Embassy in Uganda; the Executive Director, National Council for Higher Education; Academic Advisory Board from NL; Vice-Chancellors for all the Public Universities in Uganda; Academic Registrars for all the Public Universities in Uganda; Director Institute of Computer Science at MUST, Heads of Computer Science at Gulu and Kyambogo Universities; Makerere University Management; Director and Deputy Directors School of Graduate Studies Makerere University; Dean, Faculty of Science (KYU); CIT Management, and CIT Senior Members of Staff.

Each Vice-Chancellor was given a bag containing the relevant Project Documents and Proceedings of the ICT Stakeholders Workshop held from 3rd-4th May 2007 at Ridar Hotel Seeta, Mukono.

2.2 Component A: Building a sustainable ICT Human Resource Capacity

2.2.1 A1: 30 PhD Programmes Commence

The application process of the PhD candidates started in July 2007 and the selection exercise was done in August based on interviews that were held from 27th to 29th August 2007 for all the shortlisted applicants from the Four Public Universities of Makerere, Mbarara, Kyambogo and Gulu. The exercise was done by the Academic Advisory Board chaired by Prof. John Nerbonne (RUG), the Overall Academic Supervisor of the Project for the three institutions in The Netherlands. Other members present were Prof. Dr. Gerard Renardel de Lavelette (RUG); Prof. Dr. Ir. Theo van der Weide (RUN); Prof. Dr. Mark van den Brand (TUE); and Prof. Dr. H.A. Erik Proper (RUN). Mr. Erik Haarbrink (the Project Coordinator in NL) and his team provided administrative support to the Board. All the selected candidates were initially admitted at Makerere University so that those who would not be selected to study in The Netherlands would have a fallback. Thereafter the selected candidates had a research visit of two months (October- December 2007/January 2008) to Institutions in The Netherlands for which they were selected in line with their research interests and the research groups at those Universities.

Table 3: Selection and Distribution of the 30 PhD Positions in NL and UG

S N	Institution	Planned Distribution (As per the Proposal)		Total (30)	Actual Distribution (As per Final Selection in 2007)		Total (30)	Current Distribution (As at the Close of Project 2011)		Total (30)
		NL (10)	UG (20)		NL (10)	UG (20)		NL (10)	UG (20)	
1	Makerere University	6	12	18	5	13	18	5	15	20
2	Mbarara University of Science & Technology	2	3	5	2	4	6	2	3	5
3	Kyambogo University	1	2	3	2	1	3	2	1	3
4	Gulu University	1	3	4	1	2	3	1	1	2
	Total	10	20	30	10	20	30	10	20	30

At the time of selection Makerere University obtained 18 positions (5 in The Netherlands and 13 at Makerere University); Mbarara University of Science and Technology obtained 6 positions (2 in The Netherlands and 4 at Makerere University); Kyambogo University obtained 3 positions (2 in The Netherlands and 1 at Makerere University); and Gulu University obtained 3 positions (1 in The Netherlands and 2 at Makerere University). Mbarara University of Science and Technology got excess of one candidate where as Gulu University got a shortage of one candidate vis-à-vis the original proposed distribution. Mr. Jimmy Omony (from Gulu University) who was selected and actually went for the two months visit at University of Groningen turned down the offer during the

visit citing preference to be registered in The Netherlands rather than in Uganda as had been approved by Gulu University, which option was not possible at the time. He was immediately replaced with Ms. Esther Namirembe (Mbarara University of Science and Technology) since Gulu University did not have any other candidates available for selection. Makerere University had originally given its 18th position to Kyambogo University but later on got it back after Ms. Regina Awor Komakec who was initially selected declined the offer. This position was filled by Mr. Ernest Mwebaze of Makerere University. Mr. Caesar Ogole who was initially selected for Mbarara University of Science and Technology was immediately replaced with Ms. Annabella Dorothy Habinka of the same University after realization that Mr. Ogole would not be able to complete his M.Sc degree training in time to take on the PhD position. However, Ms. Habinka was not able to take her visit to The Netherlands in 2007 as it required more time to match her with a supervisor and research group at RUG.

During their research visits at Institutions in The Netherlands, candidates were put in research groups from which 10 candidates were selected to study at Institutions in The Netherlands and the remaining 20 at Makerere University with regular research visits to their respective Universities of study in The Netherlands as shown below:

Table 4: List of 30 PhD Students at the Selection Time in 2007 Per University

Makerere University				
Sn	Name	Sex	Training Institution at Selection	Training Institution at Project Closure
1	Agnes Nakakawa	F	Radboud University Nijmegen	Radboud University Nijmegen
2	Fiona Penlope Tulinayo	F	Radboud University Nijmegen	Radboud University Nijmegen
3	John Kizito	M	University of Groningen	Scholarship cancelled
4	Johnson Mwebaze	M	University of Groningen	University of Groningen
5	Peter Nabende	M	University of Groningen	University of Groningen
6	Fred Noah Kiwanuka	M	Makerere University	University of Groningen
7	Richard Ssekibuule	M	Makerere University	Makerere University
8	Rose Nakibuule	F	Makerere University	Makerere University
9	Emily Bagarukayo	F	Makerere University	Makerere University
10	Irene Nakiyimba	F	Makerere University	Makerere University
11	Mercy Rebecca Amiyo	F	Makerere University	Makerere University
12	Peter Khisa Wakholi	M	Makerere University	Got another Scholarship
13	Richard Mayanja	M	Makerere University	Scholarship cancelled
14	Aminah Zawedde Sebagala	F	Makerere University	Makerere University

15	Ernest Mwebaze	M	Makerere University	Makerere University
16	Mary Komunte	F	Makerere University	Makerere University
17	Raymond Mugwanya	M	Makerere University	Makerere University
18	Drake Patrick Mirembe	M	Makerere University	Makerere University
Mbarara University of Science and Technology				
1	Joyce Nakatumba	F	Eindhoven University of Technology	Eindhoven University of Technology
2	John Businge	M	Makerere University	Eindhoven University of Technology
3	Annabella Dorothy Habinka	F	Makerere University	University of Groningen
4	Martin Ngobye	M	Radboud University Nijmegen	Makerere University
5	Esther Namirembe	F	Makerere University	Scholarship Cancelled
6	Evarist Nabaasa	M	Makerere University	Makerere University
Kyambogo University				
1	Jackline Ssanyu	F	Eindhoven University of Technology	Eindhoven University of Technology
2	Denis Ssebuggwawo	M	Radboud University Nijmegen	Radboud University Nijmegen
3	Loy Muhwezi Abaine Kakuri	F	Makerere University	Scholarship Cancelled
Gulu University				
1	Proscovia Olango	F	University of Groningen	University of Groningen
2	Geoffrey Tabo-Olok	M	Makerere University	Scholarship Cancelled
3	Raphael Aregu	M	Makerere University	Makerere University

It is important to note that Students who failed to progress had their scholarships terminated and replaced with others as shown in A2 and A3 below.

2.2.1.1 Laptops for PhD Students

All the selected 30 PhD Students were given laptops to assist them while undertaking their PhD training. These laptops are properties of the respective institutions where these students are members of staff and are forth required to be returned in case one ceases to be a member of that Institution. All the laptops are IBM Lenovo ThinkPads.

2.2.2 A2: Continuation of 10 PhD programmes at RUG, RUN and TUE

At the end of the first research visit in The Netherlands, the Academic Advisory Board in NL on the advice of the research leaders of each research group with which the students were working selected 10 candidates to study in The Netherlands as follows: RUG- 4, RUN- 4 and TUE- 2. However this status has changed as follows: John Kizito who had been selected to study at University of Groningen was replaced by Fred Noah Kiwanuka after being advised by his supervisor to return and continue in Uganda. The latter did not happen. Mr. Martin Ngobye of MUST who was selected to study at Radboud University Nijmegen was replaced by John Businge to study at Eindhoven University of Technology. Ngobye is now studying at Makerere University. These changes have put the distribution of the 10 positions as follows: RUG- 4, RUN- 3 and TUE- 3. Progress status of the 10 PhD students in NL is also elaborated in table 5 below.

Table 5: 10 PhD Positions at RUG, RUN and TUE/Progress Status as at May 2011

Sn	Name /Home Institution	Sex	Training Institution in NL	Supervisors/ Promotors	Academic Progress /Expected Date of Completion
1	Fred Noah Kiwanuka [Makerere University]	M	University of Groningen		
2	Johnson Mwebaze [Makerere University]	M	University of Groningen		
3	Peter Nabende [Makerere University]	M	University of Groningen		
4	Proscovia Olango [Gulu University]	F	University of Groningen		
5	Agnes Nakakawa [Makerere University]	F	Radboud University Nijmegen		
6	Denis Ssebuggwawo [Kyambogo University]	M	Radboud University Nijmegen		
7	Fiona Penlope Tulinayo [Makerere University]	F	Radboud University Nijmegen		
8	John Businge [Mbarara University of Science & Technology]	M	Eindhoven University of Technology		
9	Jackline Ssanyu [Kyambogo University]	F	Eindhoven University of Technology		
10	Joyce Nakatumba [Mbarara University of Science & Technology]	F	Eindhoven University of Technology		

2.2.3 A3: Continuation of 20 PhD programmes at Makerere University

In 2007, 20 students were selected to pursue their PhD Studies at Makerere University as shown in Table 3. The 20 have Supervisors both in Uganda and in NL with exception of a few. The distribution of the 20 positions among the southern Universities was as follows: MAK- 13, MUST- 4,

KYU- 1 and GU- 2. However along the way some candidates have had to be dropped from the project due to none progress and replaced with others. As such the distribution of positions among the four universities has had to change as follows: MAK- 15, MUST- 3, KYU- 1 and GU- 1. The following students had their scholarships terminated due to failure to show commendable progress: Loy Muhwezi Abaine Kakuru of Kyambogo University- December 2008, Geoffrey Tabo of Gulu University-December 2008, Richard Mayanja of Makerere University-May 2009 and Esther Namirembe- September 2010. Peter Khisa Wakholi got another scholarship. These were replaced by other PhD students who were progressing well so that the end result is 30 PhD holders: Paul Muyinda Birevu, Paul Ssemaluulu, Ismael Wadembere, Fridah Katushemerewe, Agnes Freda Namulindwa Lumala and Emmanuel Mugejjera. Some students have been identified to complete their studies from University of Groningen: Ernest Mwebaze, Paul Ssemaluulu are confirmed.

Table 6: 20 PhD Positions at Makerere University/Progress Status as at May 2011

Sn	Names/NL Institution	Sex	Status of Academic Progress	Supervisors	Expected Date of Completion
Students from Makerere University					
1	Paul Muyinda Birevu [RUN]	M	Student successfully defended his PhD on 29 th September 2010 and is due to graduate in January 2011. He received an award for his work from a re-known publisher called Emerald. He also won a UCC award for the best graduate research project of the year 2010 on 29 th Oct 2010.	Dr. Jude T. Lubega Prof. Theo van der Weide	Completed and graduates on 21 st January 2011
2	Agnes Namulindwa Lumala [RUG]	F	Approved proposal with 4 publications, another journal paper under review , finalizing thesis writing	Dr. Jose Quenum Prof. Marco Aiello	On track to complete by March 2011.
3	Aminah Zawedde Sebagala [TUE]	F	Approved proposal and two publications. Student's progress is commendable. There is a possibility of transferring to complete from NL	Dr. Ddembe Williams Prof. Mark van den Brand	On track to complete in 2012.
4	Drake Patrick Mirembe [RUN]	M	Approved proposal, with three publications. Another paper is under review for submission to a journal. Student's progress is commendable.	Prof. Fisseha Mekuria, Prof. H.N. Musingi Prof. Bart Jacobs Prof. Richard	On track to complete by March 2012.

				Buisman	
5	Emily Bagarukayo [RUN]	F	Approved proposal, with two publications. Another paper accepted for presentation at a conference. Student's progress has improved tremendously.	Dr. Jude T. Lubega Prof. Theo van der Weide	On track to complete in 2012.
6	Emmanuel Mugejjeru [RUG]	M	Approved Proposal with one publication. Has refocused his research direction to suit the new supervisor's guidelines. There is a possibility of transferring to complete from NL.	Dr. Josephine Nabukenya Prof. Henk Sol	On track to complete in 2012.
7	Ernest Mwebaze [RUG]	M	Approved proposal, four publications. Another paper has been accepted for presentation to a conference Student's progress is commendable. There is a possibility of transferring to complete from NL.	Dr. John A. Quinn Prof. Michael Biel	On track to complete in 2011.
8	Fridah Katushemererwe [RUG]	F	Approved proposal, with two publications. Student's progress is commendable.	Prof. Arvin Hurskainen Prof. Irina Zlotnikova Prof. John Nerbonne	On track to complete in 2012.
9	Irene Nakiyimba [RUG]	F	Approved proposal, with one publication. Another paper has been submitted to a conference for review.	Dr. Ddembe Williams Prof. Marco Aiello	On track to complete in 2012.
10	Mary Komunte	F	Approved proposal, working on a paper.	Dr. Josephine Nabukenya Dr. Agnes Rwashana Semwanga	On track to complete in 2012.
11	Mercy Rebecca Amiyo [RUG]	F	Approved proposal, with two publications. Another paper has been submitted to a conference for review. The supervisors are generally happy with her progress. There is a possibility of transferring to complete from NL.	Dr. Josephine Nabukenya Prof. Henk Sol	On track to complete in 2011.
12	Paul Ssemaluulu [RUG]	M	Approved proposal, three publications have been made. The student is writing thesis and	Dr. Josephine Nabukenya Prof. Henk Sol	On track to complete by April 2011.

			testing the results from the field. There is a possibility of transferring to complete from NL.		
13	Raymond Mugwanya [UCT]	M	Approved proposal, with three publications. Student's progress is commendable.	Dr. John A. Quinn Prof. Gary Marsdon (South Africa) Prof. Mark van den Brand	On track to complete in 2011.
14	Richard Ssekibuule [RUN]	M	Approved proposal, with five publications. Student's progress is very commendable and has been the key pillar in establishing the security research group.	Dr. John A. Quinn Dr. John Ngubiri	On track to complete by June 2011.
15	Rose Nakibuule [RUG]	F	Approved proposal, two publications Student's progress is commendable.	Dr. John A. Quinn Prof. Michael Wilkinson	On track to complete in 2012.
Students from Mbarara University of Science and Technology					
16	Annabella Habinka Dorothy [RUG]	F	Approved proposal with two publications. There is a possibility of transferring to complete from NL.	Dr. Josephine Nabukenya Prof. Henk Sol	On track to complete in 2011.
17	Evarist Nabaasa	M	Approved proposal, one paper under review for publication. Student's progress is now commendable.	Dr. Tony Bulega	On track to complete in 2012.
18	Martin Ngobye	M	The student has settled in well after relocating his research undertaking from NL to Uganda. He is completing his research proposal so as to gain full admission at Makerere University. Has one publication.	Dr. Benjamin Kanagwa	On track to complete in 2012.
Student from Kyambogo University					
19	Ismail Wadembere [RUG]	M	Approved proposal, three publications already made. Student's progress is commendable, he is doing thesis write up.	Dr. Patrick Ogao Prof. Jos Roerdink	On track to submit by March 2011.
Student from Gulu University					
20	Raphael Aregu [RUG]	M	Approved proposal, with one publication. Working on another	Dr. Agnes Rwashana	On track to complete in

			paper. There is a possibility of transferring to complete from NL.	Semwanga Prof. John Nerbonne	March 2012.
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2.2.3.1 PhD Students Research Missions to NL

The project provided that each of the 20 Ph.D. Students takes three short research visits of two months to an institution in The Netherlands during the four years of the project. During the meeting held on 2nd July 2008 between the Project Management team at Makerere University and the Dutch Academic Supervisor and Dutch Project Coordinator, it was agreed that except for special cases, students studying at Makerere University should only be allowed to travel to NL after having an approved proposal so that they can maximally utilise their visit time. Following is a table showing research visits undertaken by each of the 20 students on the Ugandan side for the four years of the project.

Table 7: Taken Research Missions for the 20 PhD students at Makerere University

Sn	Name	Institution in NL	Sex	2007	2008	2009	2010	2011
Makerere University								
1	Paul Muyinda Birevu	[RUN]	M			Yes		
2	Agnes Namulindwa Lumala	[RUG]	F				Yes	
3	Aminah Zawedde Sebagala	TUE]	F	Yes	Yes		Yes	Yes
4	Drake Patrick Mirembe	[RUN]	M	Yes	Yes		Yes	
5	Emily Bagarukayo	[RUN]	F	Yes			Yes	Yes
6	Emmanuel Mugejjera	[RUG]	M				Yes	Yes
7	Ernest Mwebaze	[RUG]	M		Yes	Yes	Yes	
8	Fridah Katushemererwe	RUG]	F			Yes	Yes	
9	Irene Nakiyimba	[RUG]	F	Yes	Yes			Yes
10	Mary Komunte		F	Yes				
11	Mercy Rebecca Amiyo	[RUG]	F	Yes		Yes	Yes	Yes
12	Paul Ssemaluulu	RUG]	M			Yes	Yes	Yes
13	Raymond Mugwanya	[TUE]	M	Yes				

14	Richard Ssekibuule	[RUN]	M	Yes		Yes		
15	Rose Nakibuule	[RUG]	F	Yes	Yes			Yes
Mbarara University of Science and Technology								
16	Annabella Habinka Dorothy	[RUG]	F		Yes	Yes	Yes	Yes
17	Evarist Nabaasa	[RUG]	M	Yes	Yes			
18	Martin Ngoby		M	Yes				
Kyambogo University								
19	Ismail Wadembere	[RUG]	M			Yes	Yes	
Gulu University								
20	Raphael Aregu	[RUG]	M	Yes		Yes	Yes	Yes

2.2.3.2 Facilitation of PhD Students from MUST, Gulu and Kyambogo Universities

Accommodation- With effect from 1st May 2008, two rooms were obtained in the Postgraduate Hall at Makerere University for two PhD students Ms. Anabella Dorothy Habinka from MUST and Mr. Raphael Aregu from Gulu University. At the time there was hope that more 4 rooms could be obtained to accommodate the other 4 students of the two Universities. In the meantime the remaining 4 students were given facilitation of accommodation of 1 night and transport refund each time they came to meet with their supervisors at Makerere University up to a tune of 3 times in a month. These arrangements were meant to help the students meet with their Supervisors physically to discuss research issues.

Mobile Internet Connectivity- The Project Management team kept receiving complaints from students of MUST, Gulu and Kyambogo Universities about poor internet access and connectivity at their respective Universities which kept necessitating them to travel often to Makerere University to access internet. In lieu of the above management agreed to facilitate them with mobile Internet connectivity through GPRS (General Packet Radio Service), provided by MTN Uganda Ltd. This facilitation became effective from December 2008. The beneficiaries are Annabella Dorothy Habinka, Evarist Nabaasa, and John Businge from MUST; and Raphael Aregu from Gulu University.

In addition students from Gulu and MUST were facilitated to attend one physical meeting of 2 days every month with their supervisors at Makerere University.

2.3 Component B: Strengthening ICT Educational Programmes

2.3.1 B1: Teaching and Academic Support 2007

Within the framework of the project, Institutions in Uganda were to receive teaching and academic support from experts in NL. This activity was combined with activity C1, B2 and A1. Summary of the missions is combined in tables under activity C1.

2.3.1.1 B1: Teaching and Academic Support 2007

There were no teaching and academic support missions in 2007. The staff who were to carry out these missions were also (co)Supervisors of the PhD students. The PhD students together with UG PhD holders had visits to institutions in The Netherlands between October and December 2007/January 2008 which visits required the inputs of NL staff. This made it practically impossible to have these missions take place in Uganda. However, the teaching and academic support missions were executed in 2008, 2009, 2010 and 2011 as detailed below:

2.3.1.2 B1: Teaching and Academic Support 2008

Prof. Henk G. Sol, Dean Faculty of Economics and Business at the University of Groningen came to Uganda from 16th -19th April 2008. During his visit Prof. Sol delivered a talk entitled: The Global Arena for Education in Economics, Business and IT. During his visit he also met with PhD Supervisors and the PhD Students among whom was Ms. Annabella Habinka, a PhD Student and member of staff at Mbarara University of Science and Technology.

An 'Academic Writing and Presentation Skills Workshop' was conducted by University of Groningen under the facilitation of Dr. Femke Kramer assisted by Dr. J.K Ssewanyana and Ms. Florence Tushabe (Makerere University) between 30th June and 4th July 2008. A total of 24 participants attended the course and were awarded certificates of attendance by Dr. George Nasinyama, the Deputy Director School of Graduate Studies, Makerere University.

Prof. John Nerbonne of University of Groningen visited from 1st -5th July 2008. During the visit he met with PhD Students and Supervisors to discuss their research activities as well as with the Project Management team to discuss the research progress and way forward on research visits to NL for PhD holders and students registered at Makerere University. Prof. Nerbonne also came to Uganda for the Euro ICT workshop from 21st - 22nd October 2008 at Protea Hotel, Kampala.

Prof. Thijs van der Hulst conducted a research mission from 9th to 18th July 2008 within the framework of the Nuffic Project 'Building a Sustainable ICT Training Capacity in the Public Universities in Uganda'. He was hosted by Dr. Idris A. Rai his counter part in Uganda in regards to Supervision of Ms. Julianne Sansa. During his visit he also delivered 2 talks on the following topics: 'Network and Database Requirements in Astronomy' and 'Visualization & Pattern Recognition Techniques in Astronomy'.

A 'Gender Issues in ICT Course' was conducted by Radboud University Nijmegen from 11th -15th August 2008 under the facilitation of Prof. Theo van der Weide and Ms. Nicole Flipsen (Radboud University Nijmegen), Prof. Joan Fairhurst (University of Pretoria-South Africa), Dr. Rekha Pande (University of Hyderabad- India) and Mr. Aramanzan Madanda (Makerere University). They were

assisted by PhD students; Rory du Plessis (University of Pretoria), M.N. Rajesh (University of Hyderabad), Ms. Mary Komunte, Ms. Emily Bagarukayo, Mr. Benedict Oyo and Ms. Esther Namirembe from Makerere University. The course was opened by Honorable Lukiya Nakadama Isanga, Minister of State for Gender and Culture. In this course, the impact of new ICT technology on society in general, and on gender issues in particular, was studied. Via an intensive workshop programme the participants interpreted theory as reflected in daily life situations. Participants were awarded a Certificate of Attendance at the completion of the course and a final Course Certificate after submitting and passing the course assignment reports.

Prof. Erik Poll a Researcher in the Digital Security (DS) group - formerly the Security of Systems (SoS) group - at the Computing Science Department of the Radboud University Nijmegen visited from 24th Nov- 5th December 2008. During his visit he conducted a 3 day seminar on the following topics: Ongoing Research at Radboud University Nijmegen; Software and Hardware Security Issues, Smart Cards & RFID tags; J2ME MIDP Programming of Mobile Phones; and Security in Software Development Platforms, Threat Modelling. In collaboration with staff in the Department of Software Development and Innovations he conducted an Epihandy workshop on Friday 28th November 2008 at Protea Hotel. He also held individual meetings with PhD students: Peter Wakholi, Drake Mirembe and Richard Ssekibuule; and with PhD Holders: Prof. Fisseha Mekuria (host), Dr. John Quinn and Dr. Jose Quenum.

2.3.1.3 B1: Teaching and Academic Support 2009

Prof. Erik Barendsen from Radboud University Nijmegen - visited Uganda from 9th -16th January 2009 for Curriculum review and training. Erik managed to enrich the staff members for Mbarara, Makerere and Kyambogo with vital skills in the area. He spent two days in Mbarara and one day for both Makerere and Kyambogo. He pledged further support in trying to make the curriculum better for all the universities involved in the project.

Prof. Marco Aiello from University of Groningen - visited Uganda from 9th -24th February 2009 for two weeks. He offered several research seminars in the area of Service Oriented Architecture. This research mission was very vital for several students who are researching in the area. He taught the master computer science class for one week where he introduced the students on several concepts related to algorithms.

Prof. Henk Sol from University of Groningen - visited Uganda from 11th -17th February 2009 for one week and offered several seminars on the Design Science Approach for undertaking PhD research. This research visit was very beneficial to so many students who have now refocused their research into Design Science. The visit also benefited so many PhD prospective students who exchanged ideas with the professor and received several tips on how to undertake research.

Prof. John Nerbonne from University of Groningen- visited Uganda from 19th -24th February 2009 and offered two seminars on linguistics and language processing. He also visited Gulu University on a research mission.

Dr. Michael Biehl from University of Groningen visited Uganda from 2nd -6th March 2009. During the visit his main activities were teaching a special course- Neural Networks for PhD and MSc students in the evenings throughout the week and having academic meetings in the afternoons. On Thursday 5th March 2009 he delivered a seminar on the topic 'Learning Vector Quantization and Relevance Learning: Classification of Adrenal Tumors Based on Steroid Profiles'. The target group was Academic staff and research students, interested in health informatics and artificial intelligence.

Mr. George A Mulder, the Director of Academic Affairs University of Groningen paid a visit to Uganda from 28th June – 2nd July 2009. During his visit he facilitated at the Quality Assurance Workshop organized by Mbarara University of Science at Technology on 2nd and 3rd July 2009 under the theme 'Enhancing Quality Assurance at Mbarara University of Science and Technology'. He also held meetings with the staff at Makerere University and discussed quality assurance related matters.

Prof. Henk Sol visited Uganda again from 29th July- 4th August 2009. During this visit he gave a keynote address during the 5th Annual International Conference in ICT Research hosted by Makerere University. He also held supervisory meetings with PhD students (Annabella Habinka from MUST, Mercy Amiyo, Paul Ssemaluulu, Richard Mayanja, Grace Ssekakubo, Daniel Luzinda, Rehema Baguma, and Emmanuel Mugejjera); and prospective PhD student- Ms Fiona Ssozi.

Dr Henny van der Meiden from Radboud University Nijmegen, NL made a research mission for one week from 7th -14th November 2009. She was focusing on ICT for Education specifically Distance Learning. In one of her activities she visited Kyambogo University where she offered a mini workshop on how to provide effective distance education through technology. She also undertook supervision of some students especially those working in the areas of ICT for education.

2.3.1.4 B1: Teaching and Academic Support 2010

The following staff from Institutions in the Netherlands carried out teaching and academic support missions to Institutions in Uganda in 2010:

Prof. Dr. Ir. Theo van der Weide from Radboud University Nijmegen visited Makerere University Faculty of Computing and Informatics Technology and delivered a web science course on 19th January 2010 to Masters and PhD students and other interested members from the faculty. On 21st January 2010 he held supervisory meetings with his PhD students and provided academic guidance to prospective PhD students.

Prof. Dr. Mark van den Brand from Eindhoven University of Technology visited Makerere University Faculty of Computing and Informatics Technology and delivered an MDE & DSL course on 19th January 2010 to Masters and PhD students and other interested members from the faculty. He also provided academic guidance to PhD students. On 21st January 2010, during his visit to MUST,

Prof. Mark van den Brand also had a discussion with John Businge on the progress of his research. The outline of a paper was discussed based on his current results.

Prof. John Nerbonne visited Gulu University on 20th January 2010. During the visit he discussed the academic progress of the PhD students from Gulu University. He met individually all the students. He also held a meeting with all staff of the department of computer science at which he emphasized the need to establish and hold regular research meetings.

Prof. Michael Biehl from the University of Groningen visited Makerere University Faculty of Computing and Informatics Technology from 14th -19th March 2010. During the week he gave a three day course on Modeling and Simulation to the Masters Class and interested members from the faculty. On the fourth day he gave a talk/seminar to the Machine Learning research group and other interested members in the faculty. On the last day he held meetings with several students.

Prof. Jos Roerdink from University of Groningen visited the Faculty of Computing and Informatics Technology from 28th May to 4th June 2010. He was hosted by Dr. Patrick Ogao with whom he undertook visits to Mulago Hospital and Mbarara University of Science and Technology. Prof. Roerdink offered lectures to the medical school students in MUST and to the Pattern Recognition Group at CIT.

Prof. Dr. Ir. Theo van der Weide of Radboud University Nijmegen also came for a research visit from 18th-22nd July 2010. During his visit he attended the Phd Defenses for Mr. Paul Muyinda Birevu and Ms. Priscilla Tidenderana on 19th July 2010. He also visited Mbarara University of Science and Technology and held meetings with senior staff at Makerere University and supervisory meetings with his students.

Prof. Henk Sol from University of Groningen visited Makerere University Faculty of Computing and IT from 20th -23rd March 2010. During the visit he held supervisory meetings with his PhD students; Mercy Amiyo, Raphael Aregu and Paul Ssemaluulu. He also conducted a Design Science workshop that was attended by several PhD students and other upcoming researchers. It was observed that several students in CIT were using the design science approach to undertake their research and establishment of such a research group was very important.

Prof. Henk Sol also visited from 31st July -9th August 2010. During this visit he held meetings with several PhD students: Philip Ayoo Ouma, Richard Batte, Annabella Habinka, Emmanuel Mugejjera Aminah Zawedde, Mercy Amiyo, Raphael Aregu and Paul Ssemaluulu; and prospective PhD student Pros Katumba. He also conducted a workshop on Decision Enhancement Services on 9th August 2010. This workshop was attended by several PhD students and other upcoming researchers including master students.

Martijn Wieling of University of Groningen visited the Faculty of Computing and Informatics Technology from 19th -24th September 2010 and delivered a course 'Some Topics in Language

Technology and Information Retrieval" together with Dr. Geoffrey Andogah of Gulu University and Peter Nabende of Makerere University.

2.3.1.5 B1: Teaching and Academic Support 2011

Prof. Henk G. Sol of University of Groningen held a mission from 23rd – 30th January 2011. During this mission he met with his PhD students- Mercy Amiyo, Annabella Habinka, Paul Ssemaluulu, Emmanuel Mugejira, Raphael Aregu, Proscovia Katumba and Senior members of staff at Makerere University, Gulu University and Mbarara University of Science and Technology. He also held consultative meetings at National Water and Sewerage Corporation organizations where some of his PhD students are carrying out research.

Prof Kees Hemerik of Eindhoven University of Technology visited Makerere University from 21st - 31st January 2011. During his visit he held supervisory meetings with his PhD student- Jackline Sanyu of Kyambogo University. He also delivered a talk on his experience on effective teaching of Computing, Research and gave a one to one advise to PhD students. He was hosted by Dr. John Ngubiri.

Prof. Erik Proper of Radboud University Nijmegen visited Makerere University between 11th and 15th April 2011. He held meetings with PhD students on PhD research proposal, with senior researchers on research strategy and delivered 3 lectures on Enterprise Architecture Modeling. **He also held meetings with** College management and Nuffic Management team on future research collaboration. He was hosted by Dr. Josephine Nabukenya.

2.3.1.6 Teaching Support to MUST, Gulu and Kyambogo Universities

In a bid to strengthen south to south collaborations and in consideration of the two months research visits by PhD students to Institutions in NL coupled with inadequate staffing levels at the above institutions, it became only natural to provide teaching support to these institutions with support from the project.

In **2008**, two teaching support missions were extended to the three Universities with the first one from 18th February 2008 to 18th June 2008 (Semester II 2007/2008) and the second one from 25th August 2008 up to 25th December 2008 (Semester I 2008/2009) as follows:

- Gulu University: Alberto Asaba, Arthur Anthony Ashaba, and Andrew Egwar Alunyu;
- Kyambogo University: Felix Bwire;
- MUST: Robert Mugonza and Ruth Nakato

In **2009**, the project facilitated teaching support missions during Semester II 2008/2009 and semester I 2009/2010 as follows:

- Gulu University: Ashaba Anthony Arthur and Alunyu Andrew Egwar (February- June 2009 for semester II 2008/2009) and Ashaba Anthony Arthur, Alunyu Andrew Egwar and Isaac Okello (August –December 2009 for semester I 2009/2010).

- MUST: Robert Mugonza and Ruth Nakato (February- June 2009 for semester II 2008/2009 and August –December 2009 for semester I 2009/2010).

In 2010, the project facilitated teaching support missions during Semester II 2009/2010 and semester I 2010/2011 as follows:

- Gulu University: Ashaba Anthony Arthur, Alunyu Andrew Egwar and Okello Isaac (30th January 2010 up to 16th May 2010 for semester II 2009/2010) and David Byansi, Dan Abudu and Isaac Okello (14th August 2010 to 18th December 2010 for semester I 2010/2011).
- MUST: Robert Mugonza and Ruth Nakato (February- May 2010 for semester II 2009/2010 and August –December 2010 for semester I 2010/2011).

2.3.2 B2: Quality Assurance Workshop

Four workshops were planned under this activity and all the four were held, as follows:

2.3.2.1 B2: Quality Assurance Workshop 2007

The first Quality Assurance workshop was held from 2nd -4th November 2007 at Colline Hotel, Mukono district. The theme of the workshop was 'Enhancing Quality Assurance in Higher Education in Uganda'. The main objective of the workshop was to inculcate good quality assurance practices in the areas of teaching, research and assessment. The workshop was a great success in terms of both attendance and deliberations. In total 57 participants attended the workshop out of the 60 invited. Opening remarks were delivered by Prof. Livingstone S. Luboobi, Vice-Chancellor Makerere University and closing remarks were delivered by Prof. Nozmo Mukibi of Mbarara University of Science and Technology. Participants were from Public and Private Universities in Uganda as well as the Public sector: National Council for Higher Education; Makerere University; Mbarara University of Science and Technology; Kyambogo University; Gulu University; Busitema University; and Islamic University in Uganda.

2.3.2.2 B2: Quality Assurance Workshop 2008

The second Quality Assurance workshop was held from 4th -6th September 2008 at Colline Hotel, Mukono. The theme of the workshop was 'Achieving Quality in Low Resource Environment'. The objectives were: to enable Universities understand and appreciate their own environments; to sensitize participants on the possibility of attaining quality in their current resource settings; and to share experiences from different university environments. The workshop was a great success in terms of both attendance and deliberations. All the invited (41) participants attended the workshop. The Opening and closing remarks were delivered by Prof. J. Opuda-Asibo, Deputy Vice-Chancellor (Academic Affairs), Kyambogo University. Participants were from the five public universities and from the private sector in Uganda.

At the closure of this workshop funds were committed to enable Mr. Ambrose Kibuuka conduct workshops for staff in the Five Public Universities in Uganda on how best universities can provide

quality education in the 21st century. This was meant to prepare universities to embark on implementation of the workshop recommendations. Busitema University held this workshop on 11th October 2008, Mbarara University of Science and Technology on 5th November 2008, Makerere University on 20th January 2009, Kyambogo University on 27th February 2009 and Gulu University on 20th March 2009.

2.3.2.3 B2: Quality Assurance Workshop 2009

During the 7th NPT Coordinators' meeting of the NPT project 'Strengthening ICT Training and Research Capacity in the Four Public Universities in Uganda' held on 30th April 2009 at Kyambogo University, it was agreed that as a way of building capacity at each of the universities, for 2009 the Quality Assurance workshop should be organized at individual university level. The third quality Assurance workshop (s) were therefore held at individual universities as follows:

- Makerere University- 21st May, 2009 and on 27th August 2009 at Rider hotel.
- Mbarara University of Science and Technology- on 2nd -3rd July 2009 at Mbarara University Guest House.
- Gulu University- from 7th to 10th August 2009 at Gulu University.
- Kyambogo University- from 7th to 9th June 2009 at Colline hotel Mukono.

2.3.2.4 B2: Quality Assurance Workshop

In 2010, a joint residential workshop on Quality Assurance, and Management and Leadership was organized for all the Public Universities in Uganda from 1st to 3rd July at Lake Victoria Hotel Entebbe. Quality assurance matters were discussed on 1st July 2010 with guidance from a team of experts in Quality Assurance: Dr. Andrew Mwanika and Dr. Moses Galukande. The workshop was a great success in terms of attendance and deliberations. 37 participants attended the workshop. Among the participants were Vice- Chancellors and Deputy Vice Chancellors, Academic Registrars and Senior members of staff from the five public universities in Uganda. The Opening remarks were delivered by Prof. Venansius Baryamureeba, Ag. Vice Chancellor, Makerere University and the closing remarks by Prof. J. Opuda-Asibo, Deputy Vice-Chancellor (Academic Affairs), Kyambogo University.

2.3.3 B3: ICT skills training

In order to strengthen ICT educational programmes at the four public universities it was deemed important to build and strengthen ICT skills of staff in each of the Universities. This activity was executed as follows:

2.3.3.1 B3: ICT skills training- Makerere University

- E-Learning training workshop- a 2 day e-learning workshop was conducted for CIT staff on 18th and 19th August 2008 to equip them with further skills on how to use technology for education. The target group of the training was tutors who teach on both graduate and undergraduate courses in CIT. The workshop was facilitated by four e-learning specialists (Jude Lubega, Paul Birenvu, Juma Kasozi and Ali Ndiwalana). Participants were trained in

several concepts that included: Planning an e-learning course from scratch; Learning objects as a new concept for online content; The Blackboard Learning Management System Environment; Assessment and evaluation in e-learning and Blending Training Solutions. The trained tutors were encouraged to develop content for their courses and these would be placed on the already existing e-learning environment.

- Training in ICDL of 1000 members of staff at Makerere University was held between the months of September and December 2008. The aim of this training was to equip staff members with both initial and advanced skills through raising their level of; general knowledge about Information Technology (IT); competence in using personal computers; and common computer applications in their daily educational activities. The certificate awarding ceremony was held on 9th January 2009.

2.3.3.2 B3: ICT skills training- Mbarara University of Science and Technology

The first phase of ICT Skills training was conducted from 14th May 2008 up to 30th June 2008. 200 members of staff were trained. Second phase of ICT Skills training for MUST staff was done on 4th December 2009, in which more 30 members of staff were trained.

2.3.3.3 B3: ICT skills training- Gulu University

First phase of ICT Skills training was conducted from 14th – 28th April 2008. 51 members of staff were trained. In the second phase of ICT Skills training, the remaining 49 members of staff were trained from 19th-20th January 2009.

2.3.3.4 B3: ICT skills training- Kyambogo University

The ICT Skills training took place from 1st-15th September 2008 and 82 staff were trained. Other 25 staff were trained in ICDL from 9th to 20th February 2009 bringing the total to 107.

2.4.4 B4: Tracer study of ICT graduates

It was felt important that a tracer study on the ICT graduates that benefited from the NPT project on “Building a Sustainable ICT Training Capacity in the Public Universities in Uganda” be carried out so that the findings can feed into curricula review and implementation, and collaborations with the private sector and government with the aim of producing better graduates. This activity was delayed so as to accommodate the graduates from Gulu University in the study. Gulu University had its first graduates in January 2009. Terms of Reference for the study were drafted in 2007, the tracer study-advert came out on 8th December 2008 and closing date for submission of bids was on 20th January 09. Pre-bidding meeting was held on January 2009. The tracer study for computing graduates in the four Public Universities in Uganda was successfully carried out by ICT Integrated solutions in collaboration with JOBS-ICT Limited and the final report was submitted in December 2009.

The following are the **major conclusions** which also address the research questions that the study set out to answer.

- i. The private sector is the major employer in Uganda compared to the public sector.

- ii. From cross-tabulations, it was established that both male and female graduates have fairly equal opportunities for employment and career development although some sectors seem to employ more of one sex than the other. Unlike in other studies where women were found to earn less than men in similar positions, in Uganda women earn the same remuneration packages as men in similar positions.
- iii. Generally the knowledge and skills got by computing graduates were relevant for the world of work to a high extent at the time of graduation.
- iv. Most organizations have developed in-house training programmes aimed at equipping fresh graduates with desired job related skills through orientation and continuous training.
- v. The four public universities need to acquire appropriate tools/equipment and computers to facilitate learning in all programs. This is based on recommendations by 72% of the firms that were covered in the study.

From the validation workshop held on 2nd December 2009, the following **major recommendations** were made:

- i. Universities should consider adopting policies that promote participation of students in research and their involvement in policy formulation, review and/or implementation;
- ii. Universities should develop policies that encourage the industry to influence study programs in those institutions;
- iii. While gender mainstreaming seems to be taking ground in the labour market, it is important that the affirmative action is continued at Universities for some more time;
- iv. Curriculum issues need to be looked into by each University. However, during the period when the study was carried, most Universities had just completed review of their curricula. The respondents may have been referring to curricula already changed;
- v. The public universities still need support to be able to produce appropriately skilled human resource in ICT as they are not enough on the market. This is justified by the high percentage of graduates who get in employment within their first year of graduation;
- vi. Universities do not maintain records on their graduates. For instance, the study population was initially to be generated from the “where are they” lists obtained from respective universities. However, out of the four universities, only Gulu University had these lists with graduate contacts;
- vii. Many employers are interested in establishing or strengthening job attachment programmes for students, since they see this as a more efficient way of improving quality. For such interaction between the private sector and tertiary institutions to be effective a policy framework for national student job attachment should be developed. Many graduate students still prefer work in the public sector. The skills and experiences gathered through job attachments could help them decide on their career goals more efficiently;
- viii. Re-organization of public universities: This should involve curriculum review; detailed analysis of comparative advantage among the universities that will lead to productive and cost-effective specialization among them;

- ix. The private and public sector institutions should be more willing to allow university students to undertake internship within their organizations. Currently, organizations are not very receptive;
- x. University programmes allocate less time to students to think about other practical oriented issues due to a very compact curriculum of study. Universities should review their curricula and provide for free time to allow students to do practical work outside lecture rooms;
- xi. Many Information technology and computer science graduates exhibit lack of soft skills both at interview stage and during like at work. Universities should therefore create an environment where students have opportunities to acquire the much needed soft skills that would help them become better employees after graduation. The Tracer Study Report is in **Appendix A**.

2.4 Component C: Strengthening Joint Research Programme

2.4.1 C1: Research Working Visits: Dutch Experts to Uganda

2.4.1.1 C1: Research Working Visits: Dutch Experts to Uganda 2007

There were no research working visits of Dutch Experts to Uganda in the year 2007. This was because the selection of the PhD positions ended in October 2007, which then required that the selected students and UG Supervisors have their visits to The Netherlands between October and December 2007. The planned activities of the mission were carried out in the subsequent years of the project.

2.4.1.2 C1: Research Working Visits: Dutch Experts to Uganda 2008

Table 8: Summary of Teaching/ Research Visits of Dutch Experts to Uganda in 2008

Sn	Names	University	Visit Dates
1	Prof. Henk. G. Sol	University of Groningen	16 th -19 th April 2008
2	Dr. Marc. A.C. Petit	University of Groningen, NL	31 st May- 15 th June 2008
3	Dr. Femke Kramer	University of Groningen	30 th June and 4 th July 2008
4	Prof. John Nerbonne	University of Groningen, NL	1 st - 5 th July 2008, 21 st - 22 nd October 2008
5	Prof. Koos Duppen	University of Groningen, NL	2 nd - 6 th July 2008
6	Dr. Robert Janz	University of Groningen, NL	2 nd - 6 th July 2008
7	Prof. Thijs van der Hulst	University of Groningen, NL	9 th - 18 th July 2008
8	Prof. Dr. Ir. Theo van der Weide (assisted by Ms. Nicole Flipsen)	Radboud University, Nijmegen, NL	8 th - 17 th August 2008
9	Prof. Erik Poll	Radboud University, Nijmegen, NL	24 th Nov- 5 th December 2008

2.4.1.3 C1: Research Working Visits: Dutch Experts to Uganda 2009

Table 9: Summary of Teaching/ Research Visits of Dutch Experts to Uganda in 2009

Sn	Names	University	Visit Dates
1	Prof. Erik Barendsen	Radboud University Nijmegen, NL	9 th -16 th January 2009
2	Prof. Marco Aiello	University of Groningen, NL	9 th -24 th February 2009
3	Prof. Henk. G. Sol	University of Groningen, NL	11 th -17 th February 2009 29 th July- 4 th August 2009
4	Prof. John Nerbonne	University of Groningen, NL	19 th -24 th February 2009
5	Dr. Michael Biehl	University of Groningen, NL	2 nd -6 th March 2009
6	Mr. George A. Mulder	University of Groningen, NL	28 th June – 2 nd July 2009
7	Dr Henny van der Meiden	Radboud University Nijmegen, NL	7 th -14 th November 2009

2.4.1.4 C1: Research Working Visits: Dutch Experts to Uganda 2010

Table 10: Summary of Teaching/ Research Visits of Dutch Experts to Uganda in 2010

Sn	Names	University	Visit Dates
1	Prof. Dr. Ir. Theo van der Weide	Radboud University Nijmegen, NL	19 th &21 st January 2010 18 th – 22 nd July 2010
2	Prof. Dr. Mark van den Brand	Eindhoven University of Technology , NL	19 th &21 st January 2010
3	Prof. Dr. John Nerbonne	University of Groningen, NL	20 th -21 st January 2010
4	Prof. Michael Biehl	University of Groningen, NL	14 th -19 th March 2010
5	Prof. Jos Roerdink	University of Groningen, NL	28 th May to 4 th June 2010
6	Prof. Henk. G. Sol	University of Groningen, NL	20 th -23 rd March 2010 31 st July -9 th August 2010
7	Martijn Wieling	University of Groningen, NL	19 th -23 th September 2010

2.4.1.5 C1: Research Working Visits: Dutch Experts to Uganda 2011

Table 11: Summary of Teaching/ Research Visits of Dutch Experts to Uganda in 2011

Sn	Names	University	Visit Dates
1	Prof. Henk G. Sol	Radboud University Nijmegen, NL	23 rd – 30 th January
2	Prof Kees Hemerik	Eindhoven University of Technology , NL	21 st -31 st January 2011
3	Prof. Erik Proper	University of Groningen, NL	11 th -15 th April 2011

2.4.2 C2: Research Working Visits: Uganda Experts to NL

As part of strengthening research supervision for PhD students on the project and to encourage joint research and publications among the southern and northern researchers, PhD holders from Makerere University visited their counterparts at the partnering Institutions in The Netherlands. In most cases these visits were planned in such a way that they coincide with the time when the PhD

students would be undertaking their research visits in The Netherlands. Below are summary tables of the visits made in the different years of the project.

2.4.2.1 C2: Research Working Visits: Uganda Experts to NL 2007

Table 12: Summary of Research Working Visits of UG Experts to NL in 2007

Sn	Name	Host Institution	Visit Dates	Research Group/Research Area	Host/Co-Supervisor	Students
1	Dr. John A. Quinn	University of Groningen	1 st -9 th Nov 2007	Intelligent Systems	Michael Biehl & Michael Wilkinson	Ms. Rose Nakibuule
				Computational Linguistics	Prof. John Nerbonne	Mr. Peter Nabende, Mr. John Kizito
2	Dr. Martin Bagaya	Eindhoven University of Technology	7 th - 23 rd Nov 2007	Process Mining and Software Engineering	Prof. Dr. Mark van den Brand/ Prof. Dr. W.M.P. van der Aalst	Acquaintance with 6 Ugandan Students Research
3	Dr. Jose G. Quenum	University of Groningen	12 th – 22 nd Nov 2007	Distributed Systems	Prof. Marco Aiello	Ms. Aminah Zawedde Sebagala, Mr. Richard Mayanja, Mr. Fred Kiwanuka
4	Dr. Idris A. Rai	Eindhoven University of Technology	22 nd – 26 th Nov 2007	<ul style="list-style-type: none"> o Attended a mini-symposium organized for PhD students from Uganda to present their PhD proposal work. o Attended an interesting and inspiring presentation on Visualization by Prof. Dr. Ir. J. J. Wijk 		
		University of Groningen	27 th - 29 th Nov 2007	Astronomy/ Extreme Distributed Data Lineage Transport Protocols	Prof. Edwin Valentijn Prof. Thijs	Mr. Johnson Mwebaze Ms. Julianne Sansa
		Radboud University Nijmegen	26 th Nov, 30 th – 5 th Dec 2007	Wireless Sensor Networks	Prof. Frist Vaandrager	Mr. Evarist Nabaasa,
5	Dr. Patrick Ogao	University of Groningen	30 th Nov – 7 th Dec 2007	Scientific Visualization & Computer Graphics	Prof.Dr. Jos Roerdink Prof. dr. Alexandra Telea	Ms. Mariam Sensalire

2.4.2.2 C2: Research Working Visits: Uganda Experts to NL 2008

Table 13: Summary of Research Working Visits of UG Experts to NL in 2008

Sn	Staff Name	Host Institution	Visiting Dates
1	Dr. Martin Bagaya	Radboud University Nijmegen	12 th - 26 th May, 2008
2	Dr. Patrick Ogao	University of Groningen	1 st -12 th June 2008
3	Dr. John Quinn	University of Groningen	7 th -13 th September 2008
4	Prof. Fisseha Mekuria	Radboud University Nijmegen	22 nd September- 5 th October 2008
5	Dr. Jude Lubega	University of Groningen Radboud University Nijmegen, and Eindhoven University of Science &Technology	3 rd -14 th November 2008

2.4.2.3 C2: Research Working Visits: Uganda Experts to NL 2009

Table 14: Summary of Research Working Visits of UG Experts to NL in 2009

Sn	Staff Name	Host Institution	Visiting Dates
1	Prof. Irina Zlotnikova	Radboud University Nijmegen	31 st May - 20 th July 2009
2	Dr. Jose G. Quenum	University of Groningen	27 th June - 12 th July 2009
3	Dr. John Quinn	University of Groningen	9 th - 13 th November 2009
4	Dr. Josephine Nabukenya	University of Groningen	23 rd Nov - 1 st December 2009
5	Dr. Patrick Ogao	University of Groningen	13 th - 23 rd December 2009

2.4.2.4 C2: Research Working Visits: Uganda Experts to NL 2010

Table 15: Summary of Research Working Visits of UG Experts to NL in 2010

Sn	Staff Name	Host Institution	Visit Dates
1	Prof. Irina Zlotnikova	Radboud University Nijmegen	11 th - 26 th April 2010
2	Dr. Jude T. Lubega	Radboud University Nijmegen	10 th - 17 th April 2010
3	Dr. Idris A.Rai	University of Groningen	19 th - 22 nd May 2010
4	Dr. Josephine Nabukenya	University of Groningen	14 th - 30 th November 2010
5	Dr. Agnes Rwashana Semwanga	University of Groningen	14 th - 30 th November 2010

2.4.2.5 C2: Research Working Visits: Uganda Experts to NL 2011

Table 16: Summary of Research Working Visits of UG Experts to NL in 2011

Sn	Staff Name	Host Institution	Visit Dates
1	Dr. Julianne Sansa Otim	University of Groningen/TUE	24 th April -4 th May 2011
2	Dr. John Quinn	University of Groningen	26 th April- 14 th May 2011
3	Dr. Josephine Nabukenya	University of Groningen	14 th -29 th May 2011
4	Dr. Agnes Rwashana	University of Groningen	14 th -29 th May 2011

	Semwanga		
5	Dr. Jude T. Lubega	Radboud University Nijmegen	4 th July -15 th July 2011

2.4.3 C3: Research Conference

From the humble beginning in 2005 when the first conference was held, the conference grew from strength to strength each year attracting more international and local participants. Within the framework of the project, Makerere University organized and hosted four International conferences in the area of Computing and ICT Research under the theme 'Strengthening the Role of ICT in Development'. The conference provided an international forum for researchers and practitioners to present and discuss the state-of-the-art research practices in disciplines of Computing and ICT such as Information Systems, Computer Engineering, Computer Science, Information Technology, Data Communications & Computer Networks, Software Engineering and ICT for Sustainable Development. It brought together the world's most respected authorities in the above disciplines. Details are available at <http://cit.ac.ug/iccir/home/>. Proceedings of the conference were published by Fountain Publishers in a book series titled 'Special Topics in Computing and ICT Research: Strengthening the Role of ICT in Development'. All books are available at: www.cit.mak.ac.ug/iccir.

2.4.3.1 C3: Research Conference 2007

Makerere University successfully organized and hosted the 3rd Annual International Conference in the area of Computing & ICT from 5th-7th August 2007. The conference recorded participants from East & South Africa, Asia, Australia, Europe and North America. Fountain Publishers published the accepted papers presented in the conference as book chapters. The book titled, 'Special Topics in Computing and ICT Research Vol.3' was published in electronic form (CDs) and online <http://srec.cit.ac.ug/srecc07/home/>.

2.4.3.1 C3: Research Conference 2008

The 4th annual international conference on Computing and ICT Research (ICCIR 2008) was held from 3rd- 5th August 2008 at Makerere University. Participants of the conference were from all the six continents of the world. As part of the activities for the conference (ICCIR 2008) a Satellite Workshop titled '*Innovative Mobile Technology & Services for Developing Countries*' was organized as a pre-conference event. This was intended to provide a platform for sharing knowledge in the area of mobile technology. The Satellite Workshop brought together international and local experts from Massachusetts Institute of Technology (MIT); Uganda Communications Commissioner (UCC); Helsinki University of Technology, Finland; Grameen Foundation; World Wide Web Consortium (W3C) and mobile service providers in Uganda. The 1-day workshop took place on Friday, August 1, 2008, at Makerere University. The workshop was opened by Dr. Kibuuka representing the Minister of ICT. The book titled, 'Special Topics in Computing and ICT Research Vol.4' was published in electronic form (CDs) and online <http://srec.cit.ac.ug/srecc08/home/>.

2.4.3.3 C3: Research Conference 2009

Makerere University hosted the 5th annual *International Conference on Computing and ICT Research* (ICCIR) from August 2 - 4, 2009. The official opening ceremony of the conference was held on August 3, 2009 beginning at 2.00pm at CIT grounds. The Guest Speaker was Charles D. K. Senabulya, Director, IBM Sub-Saharan Africa. Dr. Yolanda A. Rankin from IBM also spoke at the conference. The keynote speakers included: Prof. Henk Sol, Groningen Nederland Netherlands & the Technical University Delft, the Netherlands; Prof. André Paul Calitz, Nelson Mandela Metropolitan University, South Africa; Prof. Jean Greyling, Nelson Mandela Metropolitan University, South Africa; Prof. Joseph Kizza Migga, University of Tennessee - Chattanooga, Tennessee, USA; and Prof. Anthony. J. Rodrigues, University of Nairobi, Kenya. 28 papers were presented and participants came from all over the world to attend and present papers. Such countries presented include: The Netherlands, South Africa, Cameroon, India, Kenya, Sweden, Australia, USA, UK, Finland, and Uganda. The book titled, 'Special Topics in Computing and ICT Research Vol.5' was published in electronic form (CDs) and online <http://srec.cit.ac.ug/srecc09/home/>

- **July 30, 2009-** A pre-satellite Workshop short course was organized. This was a 1- day intensive course on Google Android platform
- **July 31, 2009-** In addition, a 2nd Satellite Workshop titled '*Innovative Mobile Technology & Services for Developing Countries*' was organized as a pre-conference event. This was intended to foster the development of innovative and secure mobile services for solving societal needs and promote economic development. The Satellite Workshop brought together International and local experts to provide indications on the 'high-tech' innovations in mobile technologies as services for developing countries.
- **August 02, 2009-** A PhD colloquium was arranged alongside the conference to give an opportunity to PhD students in computing to get feedback from the world's renowned professors.
- **August 05, 2009-** A Post Conference Workshop on 'Research Leadership and Innovation' was conducted by Professor Dilip Patel and Professor Shushma Patel from London South Bank University.

2.4.3.4 C3: Research Conference 2010

Makerere University hosted the 6th annual International Conference on Computing and ICT Research (ICCIR'10) from August 1 - 4, 2010. 27 papers were presented and participants came from all over the world to attend and present papers. Such countries include: Ghana, Nigeria, South Africa, Senegal, Tanzania, Kenya, Malawi, India, The Netherlands, USA, UK and Uganda. The official opening ceremony of the conference was held on August 2, 2010 at Protea Hotel Kampala. The Guest Speaker was Hon. Aggrey Awori, Minister of ICT. The keynote speakers at the conference were: Prof. Joseph Migga Kizza, University of Tennessee, USA; Prof. Rodrigues Anthony, University of Nairobi, Kenya; Prof. Janet L. Wesson, and Assoc Prof. Darelle Van Greunen of Nelson Mandela Metropolitan University in Port Elizabeth, South Africa; and Joshua J. Bloch, software engineer, Google. Accepted papers in the conference were published by Fountain

Publishers as book chapters in a book entitled Special Topics in Computing and ICT Research: Strengthening the Role of ICT in Development, Volume VI, ISBN 978-9970-25-015-8.

- **July 31, 2010-** The 3rd mobile satellite Workshop on Innovative Mobile Technology & Services for Developing Countries (IMTS-DC'10), was held as a pre-conference event. The theme of the event was 'Advancing Localized Innovative Mobile Applications and Services'.
- **August 01, 2010-** A PhD colloquium was arranged alongside the conference to give an opportunity to PhD students in computing to get feedback about their works from the world's renowned professors.
- **August 3, 2010-** A tutorial workshop on Java was offered by one of the best and founders of the Java programming language Josh Bloch from the USA. Members who attended the workshop felt that it was necessary to have Josh brought back for a longer training to the Ugandan students.
- **August 4-5, 2010-** A post conference workshop on the development of the African Computer Science Curriculum was held. This event was specifically sponsored by Google.

2.4.3.5 C3: Research Publications in Refereed International Journals and Books

One of the outputs of the objective 'Strengthening a Joint (for all Public Universities) Research Programme; is to have staff in the four public Universities publish 30 papers every year in refereed international journals and books. With the support of the project Academic staff members were encouraged to showcase their work in a variety of events, such as seminars, roundtable meetings and conferences. Research has been more visible in and out of the faculty through Conferences, Journals and Websites. Most new publications have thus been presented to a broad audience. In total 177 were published by Staff of the four public Universities.

In **2007** a total of 61 papers were published as follows: 16 in Journals; 29 as Book Chapters; and 16 as Conference Proceedings.

In **2008**, a total of 63 papers were published as follows: 22 in Journals; 21 as Book Chapters; and 20 as Conference Proceedings.

In **2009**, a total of 30 papers have been published as follows: 8 in Journals; 12 as Book Chapters; and 10 as Conference Proceedings.

In **2010**, a total of 23 papers were published as follows: 6 in Journals; 17 as Book Chapters.

2.4.4 C4: Staff Attending Conferences Abroad

Within the framework of the project members of staff who had accepted papers at both the local and International conferences to present were facilitated to attend and present papers at International conferences.

2.4.4.1 C4: Staff Attending Conferences Abroad 2007

Table 17: Details of Staff who Attended Conferences Abroad in 2007

Sn	Name	Institution/ Department	Conference Name/ Venue	Dates	Title of the Paper Presented
1	Ms. Agnes Rwashana Semwanga	MAK/IS	The 25 th International System Dynamics Conference/ Boston, USA	29 th July - 2 nd Aug 2007	Is Immunization Demand Equal to Immunization Coverage? A Case Study on Uganda Healthcare Provision
2	Ms. Emily Bagarukayo	MAK/IS	6 th European Conference on E-Learning (ECEL)/ Copenhagen, Denmark	4 th - 5 th Oct 2007	Enhancing the Attainment of Higher Order Cognitive Skills Through Multi-media E-Learning
3	Ms. Mariam Sensalire	MAK/NW	5 th ACM International Conference on Virtual Reality, Computer Graphics, Visualization and Interaction in Africa/ Grahamstown, South Africa	29 th - 31 st Oct 2007	Tool Users Requirements Classification: How Software Visualization Tools Measure Up
4	Ms. Rehema Baguma	MAK/IS	2 nd International Conference for Internet Technologies and Applications (ITA07)/ West Wales, United Kingdom	4 th -7 th Sep 2007	Relating Visual Disability and the Web
5	Ms. Theodore Mwebesa Twongirwe Mondo	MUST/ICS	ACM International Conference on Information and Knowledge Management 2007/ Lisboa, Portugal	6 th -9 th Nov 2007	Collaborative Framework for Supporting Indigenous Knowledge Management

MAK-Makerere University; **IS**- Department of Information Systems; **NW**- Department of Networks;

MUST- Mbarara University of
Science and Technology; **ICS**- Institute of Computer Science

2.4.4.2 C4: Staff Attending Conferences Abroad 2008

Table 18: Details of Staff who Attended Conferences Abroad 2008

Sn	Name	Institution/ Department	Conference Name/ Venue	Dates	Title of the Paper Presented
1	Dr. John A. Quinn	MAK/CS	International Conference on Acoustics, Speech and Signal Processing, Las	30 th March – 4 th April, 2008	'Signal Masking in Gaussian Channels'

			Vegas- USA		
2	Mr. Gilbert Maiga	MAK/IT and a third year PhD student	one month training workshop at Saarlandes University, Germany	March 2008	The aim of the visit was to facilitate timely completion of the ongoing aspects of his research: Building the ontology model and evaluation tool using protégé as the selected tool.
3	Ms. Rehema Baguma	MAK/IS	IEEE International Cross Disciplinary Conference on Web Accessibility 2008 (W4A) co-hosted with the 17 th International World Wide Web Conference Beijing China.	21 st -25 th April 2008	'A Web Design Framework for Improved Accessibility for People with Disabilities (WDFAD).
			International Conference on Hybrid Learning (ICHL 2008) in Hong Kong.	13 th -15 th August 2008	Web Design Requirements for Improved Accessibility for the Blind
4	Mr. Raphael Aregu	Gulu University	An IST-Africa Conference and Exhibition in Windhoek, Namibia.	7 th - 9 th May 2008	'An ICT based Digital Content Information Access Framework in Developing Countries: the Case of Agricultural Informatics Access and Management in Uganda'.
5	Prof. Fisseha Mekuria	MAK/NW	World-Wide Web Consortium (W3C) in Sao Paulo, Brazil	2 nd - 3 rd June 2008	'Educating the Architects of the Mobile Economy'.
6	Dr. Jose G. Quenum	MAK/CS	World Wide Developer Conference in San Francisco, California	9 th -13 th June 2008	-
			IEEE/ACM, Sydney Australia	9 th -12 th Dec 2008	Generic Protocol Configuration and Execution within Coalition
7	Dr. Patrick J. Ogao	MAK/IS	Interactive Computer Graphics Conference (ACM SIGGRAPH 2008) in Los Angeles USA	9 th -17 th August 2008	ACM SIGGRAPH Cartographic Visualization (Carto) Project -Biomedical visualization
8	Dr. John Ngubiri	MAK/CS	EUROPAR'08 in Las Palmas de Gran Canaria, Spain	26 th -29 th August 2008	Co-allocation with Communication Considerations in Multi-Cluster Systems'
9	Mr. Drake P.	MAK/NW	IEEE Conference on	8 th -10 th	'Threat Modeling Revisited:

	Mirembe		Simulation and Modeling 'EMS2008' at Liverpool Hope University, England	September 2008	Improving Expressiveness of Attack Nets'
10	Ms. Emily Bagarukayo	MAK/IT	iiWAS / ERPAS – MOMM, Linz Austria	24-26 th November 2008	Impact Of Multimedia Instructional Materials On The Attainment Of Higher Order Cognitive Skills: A Literature Review

2.4.4.3 C4: Staff Attending Conferences Abroad 2009

Table 19: Details of Staff Who Have Attended Conferences Abroad in 2009

Sn	Name	Conference Name/ Venue	Dates	Title of the Paper Presented
1	Ms. Annabella D. Habinka (MUST)	3 rd European Conference on Entrepreneurship and Innovation (ECIC 2009), INHolland University of Applied Sciences, Haarlem, The Netherlands	28 th and 29 th April 2009	Knowledge Management For SME's In Developing Countries-Uganda: A Studio Based Approach
2	Ms. Rehema Baguma (Makerere University)	HCI 2009 International Conference, San Diego, California, USA	19 th to 24 th July 2009	Integrating Accessibility and Functional Requirements
3	Ms. Agnes Namulindwa (Makerere University)	2009 World Congress on Services (SERVICES 2009) - The 3 rd International Workshop on Software Engineering for Adaptive Service-oriented Systems (SEASS 2009) in conjunction with the 7 th IEEE International Conference on Web Services (ICWS 2009), Los Angeles, California, USA	6 th -10 th July 2009	A distributed Problem Solving Approach for Service-oriented Computing Systems
4	Ms. Fiona Ssozi Mugarura (Makerere University)	The International Symposium on Engineering Education and Educational Technologies (EEET2009) in the context of The 2 nd International conference on Engineering and	10 th – 13 th July 2009	'Learning Without Borders: Community Based Learning in a Development setting

		Technological Innovation (IMETI 2009), Orlando, Florida (USA).		
5	Assoc. Prof. Idris A. Rai (Makerere University)	The 5 th IASTED International Conference on Internet and Multimedia Systems and Applications (EuroIMSA 2009), Cambridge , UK	13 th -15 th July 2009	End- User Based Band Width Management Scheme For Low-Speed Access Links
		18 th IEEE on communication and Network (ICCCN09), Sanfrancisco, CA, USA	2 nd -6 th August 2009	Power Aware Differentiated Routing (PADR) In Wireless Sensor Networks

2.4.4.4 C4: Staff Attending Conferences Abroad 2010

Table 20: Details of Staff Who Have Attended Conferences Abroad in 2010

Sn	Name	Conference Name/ Venue	Dates	Title of the Paper Presented
1	Mr. Ismail Wadembere (Kyambogo University)	MSV 10:Modeling,Simulation and Visualisation Methods/Las Vegas Nevada, USA	12 th -15 th July 2010	Geometry Adjustment For Geospatial Data Integration.
2	Mr. Paul Muyinda Birevu (Makerere University)	IADIS Mobile Learning 2010,Porto,Portugal	18 th - 21 st March 2010	Mobile learning objects deployment and utilization in developing countries
3	Mr. Richard Ssekibuule (Makerere University)	9th Annual Information Security South Africa Conference (ISSA 2010)	2 nd -4 th August 2010	Secure Publish-Subscribe Mediated Virtual Organisations
4	Dr. Florence Tushabe (Makerere University)	2nd International Conference on Digital Image Processing/Singapore	26 th -28 th Feb 2010	Effect of Selected Attribute Filters on Watermarks
5	Mr. Ernest Mwebaze (Makerere University)	AAAI Spring Symposium on Artificial Intelligence for Development/California, USA	22 nd - 24 th March 2010	Causal Structure Learning for Famine Prediction
		18 th European Symposium On Artificial Neural Networks, Computational Intelligence and Machine Learning Bruges/Belgium	28 th -30 th April 2010	Divergence based Learning Vector Quantization
		In workshop on Data Mining in	12 th -14 th	Automated Vision-Based

		Agriculture (DMA 2010), Berlin, Germany	Jul 2010	Diagnosis of Cassava Mosaic Disease
6	Dr. Julianne Sansa Otim	International Conference on Networks/Menuires, France	11 th -16 th April 2010	F-TCP:A Delay - Based Protocol with fair Co-existence
7	Ms. Mercy Rebecca Amiyo	Group decision and Negotiation 2010/The Netherlands	20 th - 23 rd June 2010	A Decision Enhancement Studio Design for Improving Business Process Agility
8	Mr. Johnson Mwebaze	3 rd International Provenance and Annotation Workshop, IPAW 2010, Troy New York.	15 th -16 th June 2010	Using data lineage for sub image processing
		2010 Annual Research Conference of the South African Institute for Computer Scientists and Information Technologists, Bela Bela, South Africa	11 th – 13 th October 2010	A Provenance Framework for Sub-image processing of Astronomical Data.

2.4.5 C5: Publishing Journal Issues

In June 2007, Makerere University launched a bi-annual open-access journal. It is a peer reviewed International Journal hosted by Makerere University with an objective of providing a medium for academics to publish original cutting edge research in the field of computing and ICT. IJCIR publishes two issues per year in June and December. The journal's main aim is to highlight new research developments, experiences and best practices in computing and the use of information communication technologies (ICT) in development. These papers came from every corner of Africa and beyond, giving the journal an extended domain of researchers and practitioners to draw expertise from and to disseminate and grow with new ideas and techniques. The journal is available on-line, at www.ijcir.org.

2.4.5.1 C5: Publishing Journal Issues 2007

The maiden issue came out in June 2007 with a collection of 9 papers covering a broad range of interests in Computing and ICT issues and the second one in December 2007 with a collection of eight papers.

2.4.5.2 C5: Publishing Journal Issues 2008

The first issue for 2008 (Volume 2 Issue 1 (2008)) came out in June and the second one (Volume 2 Issue 2 (2008)) in December 2008. The June issue had a collection of six (6) papers and the December issue had a collection of nine (9) papers covering a broad range of interests in Computing and ICT issues. In addition to the two issues, a special issue was published in October

2008 to cater for the best papers (9) presented at the Annual International Conference on Computing and ICT Research (ICCIR'08).

2.4.5.3 C5: Publishing Journal Issues 2009

In June 2009, Volume 3 issue 1 was published and Volume 3 Issue 2 in December 2009. A special issue was published in October 2009. The special issue catered for the best papers presented at the 5th Annual International Conference on Computing and ICT Research (ICCIR'09). Selection was in consideration of quality of the different papers presented in all the tracks of the conference.

2.4.5.4 C5: Publishing Journal Issues 2010

In June 2010, Volume 4 issue 1 was published and Volume 4 Issue 2 in December 2010. A special issue was published in October 2010. The special issue catered for the best papers presented at the 6th Annual International Conference on Computing and ICT Research (ICCIR'10). Selection was in consideration of quality of the different papers presented in all the tracks of the conference.

2.4.6 C6: Modern University and Research Management Workshop

Five workshops were organised and held in 2007, 2008, 2009, 2010 and 2011 as follows:

2.4.6.1 C6: Modern University and Research Management Workshop 2007

The first Modern University and Research Management workshop was held from 23rd -25th November 2007 at Colline Hotel, Mukono district. The theme of the workshop was 'Enhancing Modern University and Research Management Practices in Institutions of Higher Learning in Uganda'. The main objective of the workshop was to accentuate modern practices in the areas of research, leadership and management. The Modern University and Research Management Workshop was a great success in terms of both attendance and deliberations. 56 participants attended the workshop out of the 60 invited. Opening remarks were delivered by Prof. David J. Bakibinga, Deputy Vice-Chancellor (Finance and Administration) Makerere University and Dr. Peter Ndemere, Executive Secretary, Uganda National Council for Science and Technology. Closing remarks were delivered by Mrs. Sophie Alum Acon, Dean of Students at Busitema University. Participants were from the five Public Universities in Uganda; Makerere University, Mbarara University of Science and Technology, Kyambogo University, Gulu University, Busitema University; and from Uganda National Council for Science and Technology.

2.4.6.2 C6: Modern University and Research Management Workshop 2008

The second Modern University and Research Management workshop was held from 16th -18th October 2008 at Colline Hotel, Mukono. The theme of the workshop was 'Towards the 21st Century Public University' with focus on management and research issues. The workshop was a great success in terms of both attendance and deliberations. 40 participants attended the workshop. Opening remarks were delivered by Prof. Michel LEJEUNE, Deputy Executive Director (Uganda) National Council for Higher Education (NCHE) and the Closing remarks were delivered by Sr. Dr. Mary Gorret Kaahwa a Lecturer in the Faculty of Education at Kyambogo University. Participants

were from the five public universities and from the private sector in Uganda. Participants came up with points of action and implementation in each of their Universities with specific attention to the areas of Branding, Management- Leadership, Management- Resources, and Research. It was agreed that each University should strive to:

- Create a first class student experience
- Be a world class university with an effective and efficient management system driven by people-centered leadership
- Be a self sustaining university
- Conduct research that is relevant to the society/industry/community'.

2.4.6.3 C6: Modern University and Research Management Workshop 2009

For the last two years (2007&2008) the Modern University and Research Management workshop was organized and coordinated centrally by Makerere University on behalf of the other Universities. However, during the 7th NPT Coordinators' meeting of the NPT project 'Strengthening ICT Training and Research Capacity in the Four Public Universities in Uganda' held on 30th April 2009 at Kyambogo University, it was agreed that as a way of building capacity at each of the universities, for 2009 Modern University and Research Management workshop should be organized at individual university level.

2.4.6.3.1 Makerere University

The Modern University and Research Management workshop was held during the Faculty management retreat on 28th August 2009 at Rider hotel Seeta. Topics of discussion were: reflecting on cit management practices: 2005-2009 in the context of current practices/Challenges; integration of academics and administration- experiences of an Academic and Manager at Makerere University; CIT organizational analysis which focused on streamlining & harmonizing the roles of different offices; and operationalisation of the Proposed Faculty Establishment. Where as papers were presented, there were intentional prolonged group and general brainstorming discussions to allow deeper appreciation and reaching sensible conclusions. 23 members attended and a total of 3 papers were presented.

2.4.6.3.2 Mbarara University of Science and Technology

The Modern University and Research Management workshop was held on 9th July 2009 at Mbarara University Guest House. Participants were different units of the university including top management. Facilitators were very experienced people and ratings from the conference survey forms were high for all of them.

2.4.6.3.3 Gulu University

The modern university management workshop took place on 7th October 2009. Theme of the workshop was "University for Community Transformation". The main objective was to find ways of improving university management by engaging Departmental Heads, Deans of Faculties and

university's top management in open discussions. The workshop also aimed at achieving better understanding of the dynamics of university functions and performance measurements.

2.4.6.3.4 Kyambogo University

The Modern University and Research Management workshop was held on 18th December 2009 at Colline hotel Mukono. The guest of honor was Prof. Isaiah Omoro Ndiege, Vice Chancellor of Kyambogo University. The theme of the workshop was: 'Towards a Productive Research Environment'. In total, six papers were presented. A total of 36 participants attended the workshop.

2.4.6.4 C6: Modern University and Research Management Workshop 2010

In 2010, a joint residential workshop on Quality Assurance, and Management and Leadership was organized for all the Public Universities in Uganda from 1st to 3rd July at Lake Victoria Hotel Entebbe. Management related matters were discussed on 2nd and 3rd July 2010 with guidance from a team of experts in the area: Wilber Turyasingura and Mr. Lazarus Nabaho. Topics of discussion were: Leadership in the Modern Era: The Power of Emotional Intelligence; Improving Organizational Performance for Client Satisfaction; Building Dynamic Teams for Effective Performance; Results Based Planning and Implementation Issues; and Institution Evaluation and Feedback. The workshop was a great success in terms of attendance and deliberations. 37 participants attended the workshop. Among the participants were Vice- Chancellors and Deputy Vice Chancellors, Academic Registrars and Senior members of staff from the five public universities in Uganda. The Opening remarks were delivered by Prof. Venansius Baryamureeba, Ag. Vice Chancellor Makerere University and the closing remarks by Prof. J. Opuda-Asibo, Deputy Vice-Chancellor (Academic Affairs), Kyambogo University.

At the closing of the workshop, the Overall Coordinator and Project Leader in Uganda, Prof. V. Baryamureeba, committed funds to each of the five universities to carry out a similar training in leadership and management. For Makerere University, the workshop targeted top management and Senate members and for the other universities Deans and Heads of Departments. Consequently, MUST held a similar workshop on 3rd August 2010, Makerere University on 5th August 2010, Gulu University on 11th August 2010, Busitema University on 31st August 2010 and Kyambogo University on 16th October 2010. From the reports submitted the workshops were very beneficial to staff in the respective universities.

2.4.6.5 C6: Modern University and Research Management Workshop 2011

The 5th Modern University and Research Management workshop was held on 4th and 5th February 2011 at Lake Victoria Serena Resort under the theme 'Building and Sustaining Partnerships among the Public Universities in Uganda'. The NPT-ICT project on 'Strengthening ICT Training and Research Capacity in the Four Public Universities in Uganda' was being used as a case study but the aim of the workshop was to discuss how the public universities in Uganda can collaborate and have partnerships among themselves not only in ICT but in other areas of interest to institutions of higher learning. Participants were the top managers of the five public universities in Uganda. The

Vice-Chancellors from each of the Public Universities presented a paper. The Vice Chancellor Makerere University presented a paper on 'The NPT-ICT Project in the Public Universities in Uganda: Achievements, Challenges, Lessons Learnt and the Way Forward' and the Vice-Chancellors of the other four public universities presented on the topic 'Building & Sustaining Partnerships among the Public Universities in Uganda' with a focus on their respective universities.

Participants came up with the following **Resolutions/Recommendations** on how they can move forward together as universities. The resolutions were made based on the key areas identified for collaborations. These recommendations will be discussed further at each Public University with a team of consultants that will come up with a report and an operational framework for consideration by the Vice-Chancellors Forum.

1. Each Public University should provide space on its website for visibility of other Public Universities. Universities need to appeal to their webmasters to always update, manage and maintain websites.
2. Each Public University should provide scholarships in their respective niche areas to recommended staff from other Public Universities. Universities which are already doing this should share information with other Universities.
3. Recommended formalization of staff exchanges among the Public Universities. Institutions should encourage their staff working in other public universities to provide information to them (mother institutions).
4. Recommended operationalisation of the Credit Accumulation and Transfer System for students in Public Universities whose frame work is already in place.
5. Recommended regular peer review meetings among the Public Universities.
6. Recommended consortium procurement of equipment among the Public Universities.
7. Recommended joint discipline research and knowledge dissemination among the public universities through such activities as joint conferences and joint discipline journals.
8. Recommended joint inter-university proposal writing.
9. Recommended establishing of multi –disciplinary Research Centers.
10. Recommended establishment of joint career guidance programmes through joint exhibitions, open days and shared career guidance among the universities.
11. Recommended joint Industrial Engagements among the public Universities in Uganda.

2.4.7 C7: Purchasing 70 computers and 70 Ups for research staff

Purchasing of computers for research staff at the four Universities was successfully done. Procurement was conducted in accordance with the Public Procurement and Disposal of Assets (PPDA) Act (www.ppda.go.ug) of the Government of Uganda. In Total 100 IBM Lenovo ThinkPad laptops were procured. 95 of these were distributed to the PhD Students and Research Staff at the four Universities. The remaining 4 were distributed to the Academic Registrars of the Universities and 1 to the Overall Project Coordinator to aid them in their day today administration and management activities including activities of the NPT project.

Most of the Academic Staff in the Public Universities in Uganda are non PhD holders and therefore a good number of them are pursuing either PhD or M.Sc training under Nuffic funding and other sources. It was therefore preferred that Staff be given laptops rather than desktop computers since it would make it easier for them to work from other places other than office. It was therefore agreed that these laptops be of high quality and as such IBM ThinkPad laptops were purchased since IBM is known to have durable equipment. This was done in consultation with all the Universities three of which switched fully from computers to laptops with exception of Gulu University which preferred to retain 5 desktop computers and supplement them with 5 laptops. However, this whole arrangement attracted a higher cost than originally budgeted.

2.4.8 C8: Operational Costs

Under this activity, staff and students were facilitated to undertake various missions with the aim of enabling smooth execution of research activities at institutional level. Following are highlights of this activity:

2.4.8.1 Operational National Research programme 2008

- Ms. Emily Bagarukayo a staff member at Makerere University and a PhD Student took a research visit of 6 months from 15th February to 15th August 2008 at Southern University and A&M College, USA where she closely worked with the Multimedia Research Group.
- Ms. Rehema Baguma undertook an academic visit to the Department of Computer Science at Loughborough University UK, from 1st March to 1st July 2008. While visiting she worked with the Web Accessibility Research Group, which is the area of focus for her PhD Studies.
- A Supervision workshop was held from 25th - 27th April 2008 for all senior academic staff (PhD holders), Heads of Departments, Assistant Heads of Departments and PhD students in the Faculty of Computing and IT. The key note address was delivered by Associate Professor George Nasinyama (Deputy Director School of Graduate Studies, Makerere University). Topics of discussion were: Introduction to Graduate Research; Research Supervision; 5 Norms of Scientific Writing; Research Project Planning; Quantitative Research Methodology; Qualitative Research Methodology; Scientific Writing; From Proposal to Dissertation; and Research Documentation Tools.
- 10 Masters Students from CIT travelled to Radboud University Nijmegen for 10 days from 1st-12th June 2008 on a research mission. While at Radboud University they visited ICT related companies and institutions in NL: University of Groningen, Getronics, CAP, AIA*2, and KPN among others. They also met and discussed with Radboud University Staff and gave presentations on their research areas in E-governance, Software Development and Mobile and Wireless Telecommunication.
- Ms. Harriet Birungi Nyakaana, a Research Administrator in the Faculty of Computing and IT was supported to finish her MA training in Public Administration at Makerere University. Since CIT will remain the main ICT Research Centre in Uganda and shall continue to play

the role of the National Research Coordinator, Ms. Nyakaana's training was found relevant to the National Research Programme under the project and in building the coordination and management capacity not only for the project but also the country.

2.4.8.2 Operational National Research programme 2009

- Ms. Rehema Baguma undertook an academic visit to the Department of Computer Science at Loughborough University UK, from 22nd April to 22nd May 2009. While visiting she worked with Dr. Roger.G. Stone, head of the Web Accessibility Research Group, which is the area of focus for her PhD Studies.
- In collaboration with Radboud University Nijmegen, and the local NGO Rwenzori Information Centers Network (RICNET), CIT is empowering Information Centers in the Rwenzori Region to provide specific information like organic farming techniques, soil improvement, agro-forestry, seed security issues and post harvest management. 3 students from NL arrived on 30th July 2009 and will be in Uganda up to 24th August 2009. A total of 8 Ugandan students are involved in this project. 1 CIT student is sponsored by RICNET and 7 others have been facilitated by the project to undertake this activity. They will leave for Fort portal on 2nd August 2009 and will return on 16th August 2009. From 17th to 21st August the group will visit 3 secondary schools in Kampala and the National Curriculum Development Centre to demonstrate a developed tool on Incorporation of ICT in Secondary Education.
- A two- day Graduate students Research Workshop was held on 5th and 6th December 2009. The workshop aimed at helping masters' students in attaining further skills that would help them accomplish their pending research projects. It was established that many of the students get stuck at research level due to lack of the appropriate research skills. In total, 40 students attended the workshop.

2.4.8.3 Operational National Research programme 2010

- Two Research workshops were held in July and August 2010 for graduate students. These were meant to help masters' students to attain further skills that would help them accomplish their pending research projects. On average 45 students attended each workshop indicating the need for such workshops to uplift students. These students who attended were offered an opportunity to complete their research by November 2010 or else be recommended for the award of a terminal diploma.
- CIT in collaboration with Radboud University Nijmegen completed a Community Outreach Project (COP). The project was coordinated by Dr. Jude Lubega and Dr. Rehema Baguma and utilized 8 CIT second year students and 2 students from Radboud University Nijmegen. This project was meant to teach both primary and secondary teachers how to integrate ICT in education. The project was undertaken in two weeks and two primary and two secondary schools were considered. These schools included Kibuli Senior Secondary School, St. Kizito Bugolobi Secondary School, St. Anthony Kajjansi Primary School and St. Peter Nsambya Primary School. Over 100 teachers in total were trained in different ICT

applications including the use of UBUNTU that has been developed specifically for primary and secondary education. The students also managed to repair some of the computers that were not functioning within the schools. The full report of this project was presented to CIT management on 27th August 2010.

2.5 Component D: Improvement of ICT and Teaching Infrastructure

It is imperative to note that during the procurement of the equipment for both activities D1 and E1, equipment was categorised in lots. Different suppliers were selected to supply different lots because of benefits in terms of costs and specialisation. For instance, a company would quote cheaply on computers and expensively on UPS' where as another company would be cheap on UPS' and expensive on computers. In making an analysis it was found imperative that its better to allow different companies supply those particular items where they have quoted cheaply so as to get value for money.

2.5.6 D1: Investments- ICT Training Infrastructure

Table 21: Procurement of ICT Training Infrastructure

Equipment	Supplier	Manufacturer	Status
Purchasing 70 computers and 70 Ups for research staff (40 for MAK, 10 for MUST, 10 for GU and 10 for KYU)	International Business Solutions Ltd	Lenovo	Equipment delivered and distributed to the respective Universities as follows: MAK- 40 laptops MUST- 10 laptops KYU- 10 laptops Gulu- 5 laptops & 5 desktop computers
1150 computers (1000 for MAK, 50 for MUST, 50 for GU and 50 for KYU)	International Business Solutions Ltd	Lenovo	<ul style="list-style-type: none"> • 855 Desktop Computers (including 5 for Gulu research staff) all delivered and distributed to the Universities as follows: • 50 for Mbarara University • 55 For Gulu University • 50 for Kyambogo University • 700 for Makerere University <p>All computers above were delivered, installed and students' laboratories are fully operational.</p>
	Computer Point Uganda Ltd	Sun Microsystems	300 thin clients for Makerere University were delivered, installed and networked.

1150 UPS (1000 for MAK, 50 for MUST, 50 for GU and 50 for KYU)	Technology Associates	Tripplite	1000 UPS' (800 Small UPSes (750Va) and Two Heavy Duty (10KVA) were procured.
	Southern Business Solutions	Tripplite	155 UPS' (including 5 for Gulu research staff) were procured.
4 Interactive White Boards (one per University) , 4 Laptops to be used with white boards, 4 Projectors to be used with white boards	ICT Consults Ltd	Smart Technologies/ NEC	All Equipment were procured and distributed to all the Universities.
	NCR Service & Computer Industries Ltd	DELL	For Makerere University more 5 projectors were procured to cater for the GIS lab, Multimedia lab, 300 seater Thin Clients lab and for the 700 seater lab.

2.5.1.1 Verification of Nuffic I and II Equipment at MUST, Kyambogo and Gulu Universities

During the 4th Coordinators meeting held in August 2008 at Makerere University it was agreed that Mr. Arthur Kwesiga, a Systems Administrator at the Faculty of Computing and IT be given a verification assignment of Nuffic I and II Equipment at MUST, Gulu and Kyambogo Universities under the following terms:

- check if the equipment allotted to each university is in place and was installed;
- check if the equipment allotted to each university is in the right locations;
- check if the equipment allotted to each university is being used for what it was intended;

Mr. Kwesiga did the assignment immediately and submitted a report on 15th September 2008, which report was discussed at the 5th Coordinators meeting held on 19th December 2008 at Mbarara University of Science and Technology.

2.5.1.2 Networking of Labs at MUST and Gulu University

MUST and Gulu University requested for support towards installation of Local Area Network in the Nuffic II Lab and Bachelor of Information Technology Lab respectively. Each university was given support of 19 million Uganda Shillings with an understanding that each university would pay the remaining balance on the quotation.

2.6 Component E: Strengthening the Centre of Excellence in Computing and ICT

2.6.1 D1: Investments- Centre of Excellence

Table 22: Procurement of Equipment for Centre of Excellence

Equipment	Supplier	Status
Purchasing a Desktop Publishing Unit	-	This item was under-budgeted and has been put on hold due to lack of sufficient funds. Additional funds are being sought from other sources.
Setting up an Advanced Multimedia lab	CAL Uganda Ltd	Equipment was procured. Laboratory fully operational.
Setting up an Advanced GIS lab	Technology Associates Ltd / GIS and Mapping Centre Ltd.	Equipment and software were procured. Laboratory is fully operational.
Finishing and Furnishing the floor for the Centre of Excellence; Installing LAN for the floor of Centre of Excellence	COMPLANT	Furnishing of the floor for the Centre of Excellence was completed. Network installations were done and LAN is fully operational.

2.7 Component F: Promotion of Gender Balance

2.7.1 F1: Promote Gender Balance

The target of the project in as far as gender balance is concerned was to have at least 40% of the PhD scholarships go to female candidates. Out of the 30 PhD Scholarships 14 (47%) were awarded to females and the 16 (53 %) to males. The target of those to study in The Netherlands was at least 40%. Out of the 10 students selected to study in The Netherlands 5 are females (50%) and 5 are males (50%). Out of the 20 who were selected to study in Uganda, 9 students are females (45%) and 11 are males (55%).

2.7.1.1 F1: Promote Gender Balance- Makerere University

In 2007, Makerere University run two supplements about the Faculty of Computing and Information Technology in terms of programmes offered and also highlighted successes that had been achieved by the female students and staff at CIT. In addition several adverts on gender promotion were run using University funds. The aim was to enlighten the public and potential students so as to raise the chances of attracting good female students to join the Faculty to pursue computing and ICT related programmes.

The target for 2008 is to come up with a Gender Awareness Strategy for the whole project period which may be adopted by each University for implementation according to their needs. Then activities for 2008 will follow the strategy.

In 2008, the target was to come up with a Gender Awareness and Promotion Strategy for the whole project period which may be adopted by each university for implementation according to their needs. This gender strategy was indeed put in place and distributed to all the Universities.

Radboud University Nijmegen and CIT jointly organised the course 'Gender Issues in ICT Course'. It was held from 11th -15th August 2008 held at Faculty of Computing and IT, Makerere University

In addition, members of staff from the four departments in the Faculty of Computing and IT teamed together and came up with a proposal in which gender balance promotion activity would be implemented under different activities during the coming year January – February 2009. This proposal emphasized training Women in ICT, women who can serve as role models or change agents in their communities. These include women in non governmental organizations (NGOs) and civic organizations; health sector; media industry; women teachers and administrators in primary, secondary and tertiary institutions; women student leaders in secondary and tertiary institutions; women in higher positions of responsibility as role models like Members of Parliament (MPs), Ministers, Commissioners and head teachers; gender activists in Parliament, government ministries, NGOs, private and public sectors; business sector and women entrepreneurs in manufacturing. The training was offered in the form of workshops and short training sessions for women role models in the surrounding areas only. The trainings focused on basic ICT Skills and IT Essentials.

In **2009**, Makerere University Faculty of Computing and IT trained 150 women majority of who were teachers in ICT skills. The training took place from 4th-15th May 2009 and included skills in the use of Microsoft Word, Spreadsheets, Email, introduction to computers and Power point Presentations. The certificate handover ceremony for this group was held on 10th July 2009. Another group of 350 female members of staff from Mulago Hospital were trained from 30th May up to 1st August 2009.

In **2010**, 7 female PhD students on the project were given funds to undertake projects in empowering women. These were Aminah Zawedde, Irene Nakiyimba, Mary Komunte, Mercy Amiyo, Emily Bagarukayo, Rose Nakibuule and Fridah Katushemererwe. All with exception of Mary have written papers as part of their PhD research.

2.7.1.2 F1: Promote Gender Balance- Mbarara University of Science and Technology

In **2007** Mbarara University of Science and Technology planned implementation of gender awareness and promotion activities in three phases. The first phase involved holding talk shows on local radio stations. The second phase involved compilation of information on ICT gender awareness and promotion to be published in Brochures for distribution in secondary schools. The brochures got ready in December 2007.

In **2008**, brochures developed in phase two were distributed to secondary schools after providing Training of Trainers (TOT) with special focus on Head teachers, Career Teachers and Students Leaders so that in effect they sensitise the rest of the students in their respective schools. In phase three that was carried out in November 2008, gender promotion and awareness was conducted in fifteen (15) schools in the districts of Mbarara, Ntungamo, Isingiro, Ibanda, and Bushenyi.

In 2009, MUST carried out two activities on promotion of gender balance: one as an assessment of effectiveness of Gender Promotion Strategy on visit to schools (Phase II) with the following activities:

- Designing Questionnaires and conducting survey
- Holding Meeting with Local Councils and women leaders
- Revisiting schools and holding meetings with staff and Head teachers

and another on gender promotion awareness with the following activities:

- Training of influential women,
- Policy advocacy workshop, and
- Gender promotion career guidance campaign in Primary and Secondary Schools in 5 districts of the South Western Region.

In 2010, gender promotion at MUST was done through Media Promotions, School Visitation Projects, and developing a model of "Promoting innovative start-up (incubator) projects for women as ICT entrepreneurs"

2.7.1.3 F1: Promote Gender Balance- Gulu University

In 2008, The proposal on training women was approved and training of women in and around Gulu in ICT Awareness was held for 2 weeks beginning on 11th August 2008. The participants included Nurses, Local Council women, Police women and Prisons women.

In 2009, ICT skills training for female secondary school teachers, LCV Women Councillors Police and Prisons Female Officers in Gulu district was done for two weeks from 1st to 15th July 2009. In total 46 females were trained and certificates were issued at the end of the training.

In 2010, the following activities were done:

- ICT Survey in 23 Girl's/Mixed schools in Northern Uganda was done in October 2010
- ICT Seminars in 23 Girl's/Mixed schools in Northern Uganda were done in October 2010
- ICT Skills Training for High School Girl's in Gulu Municipality was held in November 2010
- Department of Computer Science developed School Websites as a reward for commitment in use of ICT in Education for the followings schools: Ediofe Girls (Arua), St. Catherine Girls (Lira) & St. Mary's Girls (Soroti).

2.7.1.4 F1: Promote Gender Balance- Kyambogo University

In 2008, the gender proposal whose focus was on career guidance and essay writing competition in ICT areas was approved. However the commencing activity of essay competition could not take off because the timing collided with preparations for examinations for students in the primary and secondary schools. The activity could neither be held earlier as the University was closed due to a students' strike. The strike created a shift in the closure and reporting dates of the University. The local project committee at Kyambogo however designed and printed brochures that were used during sensitization in schools during term one of 2009.

In 2009, 8 staff members of Department of Computer Science at Kyambogo University carried out an ICT sensitization campaign in 9 primary schools and 17 Secondary Schools in 5 districts of Masaka, Jinja, Mukono, Wakiso and Iganga from 26th October – 25th November 2009..

In 2010, the Department of Computer Science run an essay competition in selected girls schools in five districts of Uganda i.e. Masaka, Wakiso, Mukono, Jinja and Iganga.. Essay questions on ICT topics such as ICT in education, ICT in health were set. Winning candidates were given prizes.

2.8 Component G: Collaboration among Universities, ICT Industry and Government

2.8.1 G1: Joint Research Dissemination and Consultative Workshop

A total of four joint research dissemination and consultative workshops were held during the project period as follows:

2.8.1.1 G1: Joint Research Dissemination and Consultative Workshop 2007

The first Consultative Workshop on ICT Training and Research Partnerships was held on 18th December 2007 at Serena Hotel, Kampala. The theme of the workshop was ‘Strengthening Partnerships between the Academia, the Private and Public Sectors’. The workshop was guided by the following objectives in line with ICT training and research: Identifying the roles of the Universities, Private and Public Sectors; Exploring the opportunities for partnerships; Receiving Experiences from the Industry on the quality of ICT Graduates; Brain storming on strategies to address and formulate an action plan to mitigate the existing gaps. At the end of the workshop an action plan was drawn for implementation by all the stakeholders of the workshop. Participants were from Universities, the Private and Public Sectors in Uganda; and from international organizations. In total 91 participants attended the workshop out of the 100 targeted.

2.8.1.2 G1: Joint Research Dissemination and Consultative Workshop 2008

The second Consultative Workshop on ICT Training and Research Partnerships was held on 5th December 2008 at Grand Imperial Hotel, Kampala. The theme of the workshop was “Building Synergies for an Outstanding Computing Graduate”. The objectives of the workshop were to: 1) demonstrate the capability of the public universities in fostering ICT Development in Uganda, 2) identify the missing gap in the computing training programs, 3) interest the industry to avail their ICT challenges as potential projects for university students and 4) identify strategies that would enable the universities to improve their visibility. The workshop was a great success in terms of both attendance and deliberations. 102 participants attended the workshop. Opening remarks were delivered by Prof. Charles Kwesiga, Executive Director, Uganda Industrial Research Institute. Participants were from Universities, the Private and Public Sectors in Uganda; and from international organizations such as IBM, Microsoft and Google.

2.8.1.3 G1: Joint Research Dissemination and Consultative Workshop 2009

In the spirit of building capacity at individual University level, Gulu University and MUST were supported to hold consultative workshops in their respective locations so as to help them come closer to the private sector in Mbarara and Gulu. This they did in collaboration with the Head of Corporate Relations Office at CIT. Makerere University and Kyambogo University being located in the same location agreed to host a breakfast meeting.

2.8.1.3.1 Makerere University in partnership with Kyambogo University

Makerere University in partnership with Kyambogo University hosted a consultative breakfast meeting on ICT training and partnerships on 20th Nov 2009 at Serena hotel, Kampala. This meeting was aimed at understanding how people from the industry would contribute to the existing training within these two institutions and how they could partner to work together on different activities. Stakeholders were from the ICT industry and ICT academicians. MUST and Gulu coordinators were also invited to this meeting.

2.8.1.3.2 Gulu University

The ICT Stakeholders Consultative Workshop took place on 8th December 2009 at Churchill Courts Hotel in Gulu. The main objective of the Workshop was to 'Strengthen Partnership and Collaboration between Gulu University and Private Sector/Industry'. The partnership sought to adequately prepare Gulu University graduates for career opportunity in the private sector/industry. Mr. Michael Niyitegeka, Head of Corporate Relations Office, Faculty of Computing and Information Technology (FCIT), Makerere University was the main facilitator.

2.8.1.3.3 Mbarara University of Science and Technology

MUST hosted a workshop on creation of linkages with the private sector on 8th July 2009 under the theme 'Strengthening Partnerships and Collaboration between MUST and the Industry'. The workshop mainly focused on sensitisation of MUST staff on how they can attract and also engage the private sector in the University agenda. The main facilitator was Mr. Michael Niyitegeka, Head Corporate Relations Office at Faculty of Computing, Makerere University. Mr. Niyitegeka shared with the participants the experiences of Makerere University in engaging the private sector. Topics discussed include: Information Dissemination/corporate and public relations and marketing; Role of corporate affairs personnel in an academic institution; Alumni Relations, Effective Organisation of sponsored open day events and undergraduate recruitment fair and Fostering academic-industry partnerships.

2.8.1.4 G1: Joint Research Dissemination and Consultative Workshop 2010

A joint consultative workshop on ICT Training and Research Partnerships in Uganda was held on 10th December 2010 at Protea Hotel, Kampala with the aim of consolidating the existing partnerships and forging way forward on their sustainability. The workshop was attended by 62 participants from the public universities in Uganda, government bodies and the private sector. The workshop was opened by Mr. Gideon Badagawa, Executive Director Private Sector Foundation Uganda and closed by Dr. Catherine Omaswa Executive Director E-Health Society of Uganda.

The following recommendations were made on sustainability of partnerships:

- i. Universities should put in place Institutional Relations structures to manage the Private-Public Relations. It is not feasible to depend on the Public Relations Office to undertake this assignment. Makerere University Faculty of Computing and IT provides the precedence and should be emulated.
- ii. Institutional procedures ought to be re-aligned to foster faster partnership engagement for example MoU and contract approvals take a long time through the legal departments in some universities and this is not an incentive for partnership creation.
- iii. Partners with Corporate entities to undertake Industrial training at the Universities. Majority of the organizations that are willing to take on students lack sufficient space to offer the training, however some are willing to visit the Universities to offer the training using the available infrastructure.
- iv. All University Administrators and Academic Staff should undergo Institutional Relations training to enable them act as ambassadors. This task should be embraced by everyone in the University.
- v. All Universities should form strategic partnerships with key government agencies like NITA-U and Uganda Communications Commission/Uganda Broadcasting Corporation since these institutions have funds to support some of the activities in the respective universities.
- vi. Alumni Relations should be fostered by all Universities. It was agreed that all Universities should hold Alumni Re-Union's before the end of April 2011 this will stimulate alumni relationships but could also trigger support. Special activities should be planned for that will engage alumni like the establishment of Continuous Professional Development.
- vii. Involvement of the Private Sector in University training programs as adjunct lecturers on some courses to enable knowledge transfer from industry into academia and vice-versa.

2.8.2 G2: Joint ICT Incubation Projects

2.8.2.1 G2: Joint ICT Incubation projects- Private Sector

There are hardly joint projects among the private and public sectors (Public Universities) in Uganda. It was therefore felt very important to have a component to link each ICT department in the Public Universities with the private sector. Because of lack of best practices within Uganda it was difficult to come up with good projects to link Universities with the private sector in 2007. In fact the proposed projects did not measure up. Therefore the period between June and December 2007 was largely spent on holding informal interactions with the private sector so as to break and level the ground for fruitful collaborations. These interactions were sealed off with a consultative workshop on strengthening ICT Training and Research Partnerships between the Academia, the Private and Public sectors in Uganda' held on 18th December 2007 at Serena Hotel, Kampala.

2.8.2.1.1 G2: Joint ICT Incubation projects- Private Sector: Makerere University

Activities for 2007

Joint Digital Laboratory

In an effort to strengthen linkages with the private sector, Makerere University Faculty of Computing and IT in consultation with different partners set up a Joint Digital Laboratory that would cater for their diverse range of needs. The partners in this collaboration include Nuffic, Google, Nokia, HP, MTN, among others. With the surge of mobile devices in Uganda and the region this digital lab has the potential to attract a number of projects. Some of the projects have already started and others are at proposal stage.

- **Collaboration with Nokia Mobile-** The Faculty has reached an understanding with Nokia to jointly undertake application development that is relevant to the Ugandan user. Under this partnership a mobile computing lab has been set up and is now in use. Nokia has contributed 20 high end mobile phones that are to be used in the development of the different applications.
- **Collaboration with HP-** CIT won the 2008 HP Technology for Teaching Higher Education Grant Initiative – Award. Out of 36 Universities from Europe, Middle East and Africa that were competing, 15 were awarded and 3 of them are from Africa. Winning a grant from HP through a proposal titled *"Using State-of-the-art Wireless and Mobile Technologies to Deliver Mobile Computing Courses"* endorses the Faculty's effort to establish a regional center of excellence in Mobile Computing and Software Development. The tools shall help lecturers to develop and implement innovative teaching techniques and cater for laboratory equipments to facilitate hands-on coursework for students in Mobile and Wireless networking Course.
- **Collaboration with Google-** Google awarded a research grant to CIT researchers Dr. Fisseha Mekuria & Dr. Idris Rai, for the educational & research program they are developing in "Mobile Computing, Networking and Application software development." At CIT, this project particularly seeks to address the lack of mobile web content, mobile web services developers and mobile application programmers which could tailor relevant mobile services into local context and community culture. Part of the grant is to be used to purchase equipment aimed at strengthening the joint digital laboratory. In addition, Google is going to set up a "Google Corner" that will be used a contact point for the Google Guru's. The Google Guru's are students from the Faculty who will be trained by Google to train other members of the community about Google Products. The Google Corner is meant to be a contact point for anybody who will be interested in knowing about the training programs and as well as reference point for support with regard to the Google Products. The Google Corner is to be set up on the Third floor next to the Mobile Computing Lab.
- **Collaboration with IBM** - CIT received a grant from IBM for the project "Machine Learning Techniques for Prediction of Cholera Outbreaks". The proposal was written by Dr. John Quinn in the Department of Computer Science. This is a research project to take various types of data about climate, the environment, and previous patterns of

disease in different places in Uganda and use computational methods to predict when and where there is a risk of cholera. Project activities are done in collaboration with the Epidemiology and Surveillance Division at the Ministry of Health.

- **Collaboration with Microsoft**- CIT is an implementing partner under the Microsoft initiative that is supporting the Ministry of Education. CIT has been involved in providing expert advice to the NEPAD E-Schools implementation team with specific regard on how to optimally utilize the existing technologies that were given to the schools..
- **Possible collaboration with Ericsson**- We also received expression of collaboration interest from Ericson in regard to the development of software that can be used to track drugs in Uganda.

Table 23: Procurement Status of a Joint Digital Laboratory at Makerere University

Partner	Support	Status
Nuffic	<ul style="list-style-type: none"> • Logic Analyser • Digital Storage Oscilloscope • Arbitrary Waveform Generator • Digital Multimeter • Frequency Counter • 16 channels logic Signal input • Lab Kits • C.A.D.E.T Master Lab Boards • MPLAB IDE software • EAGLE schematic capture and PCB layout software • DMM • Signal Generator • Spectrum Analyser • Bit Error rate Testers • Network Analyzers • Analog and Digital Trainer • Fiber Optic Training System • Personal Computer Training System • Computer Workstations • Transistor Tester 	Equipment procured
Nokia	20 high end mobile phones	Equipment procured
Google	<ul style="list-style-type: none"> • Technical support; • Pilot for the Android phone platform usage and development • Training for the mobile computing users. 	Ongoing, tools, mobile computing equipment and software to be procured in 2009

	<ul style="list-style-type: none"> • Support to build a new program in Mobile Computing and Software Development • To set up a Google Corner- contact point for Google Gurus. • To purchase mobile computing equipment 	
HP	<p>Funded in kind the project titled "Using State-of-the-art Wireless and Mobile Technologies to Deliver Mobile Computing Courses". CIT received the following equipment</p> <ul style="list-style-type: none"> • HP Compaq notebook/tablet PCs with Microsoft® Vista • HP Ultra-slim expansion base with DVD drive • HP USB optical travel mice • HP executive carrying case • HP iPAQs • HP design jet printer • HP design jet printer stand • HP Pro-Curve wireless access router • HP Pro-Curve switch 408 • Digital projector • Mobile net education centre 	Equipment procured and training has started.
IBM	<p>Funded the project "Machine Learning Techniques for Prediction of Cholera Outbreaks"</p> <p>Project activities are done in collaboration with the Epidemiology and Surveillance Division at the Ministry of Health</p>	Ongoing
SUN Systems	<p>With support from USAID and SUN systems. CIT received the following equipment to aid e-learning:</p> <ul style="list-style-type: none"> • Sun fire X4200 servers • Sun fire X2200 servers • Sun StorEdge™ storage • Sun ultra 20 M2 workstation • Sun storage tape auto loader 24 slots • Sun Ray thin clients • LCD monitor • Sun Rack 1000-38 	Equipment procured
MTN	<p>Partner on the use of the labs. Project proposals have been exchanged and should be implemented in the nearest future.</p>	Proposals submitted

Uganda Bureau of Statistics	Development of Data Collection Application on Mobile Devices with support from Google.org	On-going
SNV-Uganda	Joint proposal submitted to Google.Org for funding. The Project titled "Measuring Teacher Absenteeism by SMS (CU@School)" was submitted to Google.org for funding and was approved.	Project approved awaiting release of funds for implementation
National Water and Sewerage Corporation	Joint collaboration on implementation of a mobile application to enable the utility body collect meter readings using mobile devices. Will also use GIS lab in the block-mapping projects with National Water and Sewerage Corporation	On-going
Motorola Inc	Motorola supplied the current communication system to the Uganda Police Force which is based on GSM platform called Tetra Communications. Motorola and CIT are to undertake training of the Police Officers and also the students who will then develop extra applications that are of relevance to the security agencies in Uganda.	On - going

The above described Joint Digital Laboratory supplemented other specialized labs to strengthen collaborations with the private sector. The specialized labs include: Multimedia lab, Geographical Information Systems lab, and Pan African E-Network Tele-Education Labs.

National Software Incubation Centre

With a seed grant of 300,000USD from Rockefeller Foundation, Makerere University Faculty of Computing and IT set up the National Software Incubation Center in January 2008. The first batch of 100 graduates started training in June 2008 and graduated in February 2009. The objective of this project was to develop capacity in software development by developing software packages required by private and public sectors both within and outside Uganda. The admission criterion was that one must be a computing graduate and must have basic knowledge in software development. Once admitted the students worked in groups of four and each group was supported by a team comprised of a mentor from the industry and a coach from the Faculty. These two worked together to ensure that the project delivered to the expectations of the organization. A total of 21 projects were successfully developed.

Other Collaborations with the Private Sector

- **Collaboration with The New Vision-** Makerere University Faculty of Computing and IT has reached an understanding with The New Vision Group to support the ICT initiatives. Initially the Faculty will develop applications that are urgently required by the company. The projects being undertaken are in line with the current industry needs and have a high potential for replication in similar businesses.

Table 24: Projects ran under the collaboration between The New vision and CIT

Project	Description
Pre-Press Computer to Printer System	Involved CIT providing human resource to understudy the functionality of the system. This was intended to provide a pool of people who understand the system and can be called upon anytime to provide backup manpower. Three students were trained on the system for one week in June 2008. Further instructions are expected from the CEO after a training completion report has been submitted. Meeting with the CEO has been scheduled to kick start full implementation of the project.
Count Sensor for the Newspaper Print Machine	The project involves establishment of the requirements to introduce a sensor component to the current counter system. The project will include current system study and identification of interface points where the developed sensor will be added. One PhD Student and two MSc students have been engaged under the supervision of Dr. Idris A. Rai. Required Components are to be procured from The Netherlands.
Workflow Process Management System	This project is expected to cover all work processes at the New Vision. It will automate the workflow procedures currently monitored manually. A meeting was held on 28 th August 2008 in which it was agreed that work begins 8 th September 2008. However the project has not commenced because New Vision was procuring new systems that are critical in implementation of this project. We have received notification that the different installations have been completed and we await confirmation in regards to commencement.

- **Collaboration with The Council for Scientific Industrial Research (CSIR)** - On October 20, 2008, Makerere University signed an Memorandum of Understanding with The Council for Scientific Industrial Research (CSIR), South Africa involving the Meraka Institute of CSIR and CIT for Makerere University. This is aimed at seeing efforts and amount of research and development in Science and Technology at these institutions increase exponentially.
- **Collaboration with Rhodes University, South Africa on Firefox Mozilla Translation-** Makerere University Faculty of Computing and IT (CIT) in collaboration with Rhodes University, South Africa and Translate.org.za a non profit organization organized a 2-day (7th-8th August 2008) long translation marathon “**translate@thon at Makerere**” aimed at translating Firefox Mozilla, an internet browser, into the Luganda language one of the popular local languages in Uganda. The project will increase the number of people using computers in Uganda and will increase access of internet content to non-English speakers. In total 283 people were trained and awarded certificates at a colorful ceremony held August 8, 2008 at CIT. The project received great media coverage on both local and international scenes.

- **Collaboration with the East African Business Week-** CIT has a partnership with the East African Business Week through a Memorandum of Understanding between the two institutions signed in May 2008. EABW agreed to give staff and students one page every week to publish and educate the public about ICT issues and in return CIT provides IT support. This is intended to provide a platform that will be used to bring out CIT's potential both at individual and faculty levels as well as attract projects.
- **Collaboration with FAST Scanning-** is a fast growing Business Company that does scanning of documents for the California State University system. CIT signed a MoU with Fast Scanning in April 2008. Benefits of this collaboration to the Faculty include Jobs for students and potentially after they graduate; An affiliation with universities in the State of California educational system; The Faculty gets bragging rights for students working on very important engineering documents for major universities throughout the United States; Students will also gain experience working with Virtual Servers, Virtual Desktop Infrastructure, Citrix, Xen and many other advanced Adobe and Autodesk products. At the basic level where the drawings are processed and data entry is done, the students will be communicating via Skype almost daily with FAST Scanning staff.
- **Collaboration with D-Mark Mobile Ltd-** In march 2008, CIT agreed to partner and collaborate with D-Mark Mobile Ltd though a memorandum of understanding in areas of but not limited to; ICT Application Development, research and Development, and Knowledge Exchange. D-Mark Mobile is a premium Value Added Services content provider that provides sms info to telecommunications subscribers in Uganda. Their portfolio of products can be accessed by sending a designated password to 8008. SMS, WAP and MMS are having the fastest growing rate around the world compared to other data communication services with many messages sent per day. D-Mark Mobile recognized the importance and potential of such a sector to ease communication and generate revenues.
- **Other Memoranda of Understanding-** In 2008, CIT signed other Memoranda of Understanding with Yo Uganda Ltd, Jobs ICT Bangladesh, and the Centre for International E-Governance Solutions Ltd. Under these MOUs specific activities have been identified and these are in line with industry-Faculty incubation project.

Activities for 2009

- **National Software Incubation Centre-** The National Software Incubation Center has continued to attract partners from the private and public sector. It has positioned itself as a training center for software developers and now companies are sourcing for skill from the center. In the year 2009 another set of 25 private/public sector projects were implemented and this has improved the visibility of the faculty and university at large.
- **Dell Academy-** Dell Inc. has agreed to set up a Dell Academy at Makerere University Faculty of Computing and IT. The Academy is slated to start off before the end of June 2010. This is the second Dell Academy in the whole of Africa with the first being in South

Africa. The Academy will deliver certification courses based on the Dell Infrastructure. The Dell Academy will expose CIT students to the latest technology and thus enable them to acquire skills appropriate for the work place.

- **Igongo Cultural Center-** Igongo Cultural Center is a Museum that is going to be built in Mbarara. CIT was approached to provide support with regard to the ICT component of the establishment. The Center is beginning to take shape with the ICT Implementation taking place. CIT together with the Institute of Computer Science Mbarara University of Science and Technology are developing a web portal for the museum and will also support the deployment of the different technologies that are required. A technical team has been constituted to spearhead the implementation of the ICT Plan for the center.
- **Enterprise Uganda-** Enterprise Uganda is a government agency that is charged with the development of enterprises in Uganda. Enterprise Uganda and Makerere University Faculty of Computing and IT, agreed to support each other in both business and ICT training. It is envisaged that the first business training for our students will take place in June 2010. The Faculty of Computing and IT on the other hand has already trained members of Enterprise Uganda.
- **MTN Uganda-** MTN Uganda embarked on establishing the Internet Service Provision targeting market in the Small-Medium Enterprises sector. It was agreed that in turn MTN will be taking take on a dedicated number of students and staff on the internship training program and in turn CIT will provide support in different areas although initially it will be applications development for the SME members that are supported by MTN Uganda.
- CIT provided technical support to the MTN Kampala Marathon 2009 that took place on November 23rd 2009.
- **New Vision-**The first of the website was completed and handed over to New Vision. The developing team are waiting for instructions to proceed to the second phase. Two new projects are slated to start under the software incubation center in 2010.
- **Google Inc. –** the partnership of the Faculty with Google is growing stronger. Google is supporting a couple of student initiatives like the Google Code Camp, that trains students to become proficient developers, Google Marketing, that introduces students to basics of online marketing and how to earn income from online marketing on the Google platform. CIT for the second year running was invited to attend the Google-Faculty Summit in Zurich where Google interfaces with faculty from African Universities.
- **Orange Research Labs;** CIT is in the process of formalizing a relationship with Orange Research Labs based in France. Under this arrangement Orange will provide research infrastructure and human resource to support our initiatives. A draft MoU is being reviewed by the Orange Uganda team and by end of the 1st Quarter 2010 this will be signed and operationalised.
- **SAP Inc.;** SAP an ERP global company was contacted at the end of the year 2009 to enable the establishment of the SAP Academy at Makerere University. SAP in principle agreed to the setting up of the academy at Makerere University Faculty of Computing and

IT that will target final year students. The content will be availed to students at no costs; SAP will provide training support to members of the faculty. It is envisaged that the academy will start in the first half of 2010.

- **EMC Inc.;** EMC a storage company has agreed to support the establishment of a training academy. EMC is a leading storage company will provide training infrastructure and environment to students who are keen on systems management and administration. The target students for this academy will be the final year students. The academy will commence in the month of June 2010.

Activities for 2010

- **Google-** CIT through the support of the NUFFIC II project translated the Google interface into Runyakitara and Luo languages as part of its public-private sector contribution. Runyakitara is a family of the Bantu language that standard-izes four linguistically closely related lan-guages of western Uganda which are Rutooro, Rukiiga, Runyankole and Runyoro. Luo is a family of the Nilotic language and is linguistically related to languages in northern Uganda including the Alur, Acholi, Lango, Kumam, Japhadola and JoLuo. The launch was done on the 31 July 2010. This project was coordinated by Dr. Florence Tushabe. CIT also released the newest version of Firefox Mozilla in Luganda. Firefox Mozilla is a popular web browser used today and Luganda is one of the largely spoken languages in the country.
- CIT departments partnered with different organizations though ICT Incubation projects. The Department of Information Technology partnered with **TASO**-The Aids Support Organization and developed a Patient Care Management Information System. The project aimed at developing an information system that is capable of storing, retrieving, sharing and undertaking data warehousing and data mining for quick decision making on the Aids patients
- The Department of Computer Science developed and implemented an online mapping exercise under the proposal on uploading street maps of the municipalities of Jinja and Entebbe districts onto Google maps. Phase one of the online street maps project was done in Jinja and the second phase in Entebbe.
- The Department of Information Systems developed an application of mobile services in Project monitory for **PACE Uganda**- Program for Accessible Health, Communication and Education. The project aimed at developing a mobile application that enables any organization in project monitoring to collect timely and accurate data.
- The Department of Networks implemented a project 'A Socially Networked Classroom: Building Learning Objects as Community Services to Support Participatory Learning' in collaboration with Kampala District Private Educational Institutions Association Ltd. This is an umbrella that brings together private Education Institutions in Kampala.
- **British Council- (Lets go Green Campaign)** In June 2010 Makerere University entered a partnership with British Council on Using ICTS in creating awareness about climate change. Let's go green campaign run for 3 months from 22nd July to 22nd October 2010

- and Makerere University contributed to the adverts for one month. This partnership will help educate children of the poor through 'Plant a tree and take a child to school' initiative.
- **Digimation-** A Memorandum of Understanding was signed between Makerere University Faculty of Computing and IT and Digimation Company of UK in August 2010. Digimation is engaged in the business of 3D Animation education and has the state of art courses which are accredited by the NCFE National Awarding Board of UK . The collaboration is such that Digimation shall be responsible for design of the courses, constant upgrading of the courses and delivery of the courses, to students in the varied areas of- 3D Animation, and Visualization. CIT shall offer an appropriate amount of support towards this goal including but not limited to providing infrastructure in terms of hardware and software and marketing and administrative support., and has specialist manpower to deliver the courses at a high end of the market.
 - **TATA-** In October 2010 TATA Consulting Services a subsidiary of TATA India accepted to partner with CIT and AIESEC in Uganda to train the next generation of IT Experts through an international industrial/internship training program. 30 of CIT students graduating in January 2011 will benefit from this program.
 - **Microsoft-** CIT is in the final stages of concluding a collaboration with Microsoft which has accepted to establish a Microsoft Innovation Centre at CIT. This centre will provide technical and business training that will enable students innovate using Microsoft Technologies. CIT will manage the centre on behalf of Microsoft and all revenues generated will go to CIT.
 - **HumanIT (Karlstad University),** Sweden in cooperation with Makerere University (Faculty of Computing and IT) organized the first M4D conference in Africa from 10th to 11th November 2010 with several pre and post conference events. MobileMonday Kampala (MoMoKla) organized a special evening on Monday November 8th. MoMoKla is the Ugandan chapter of MobileMonday, which is a global network of mobile industry professionals and start-ups with chapters in over 100 cities around the world. On Tuesday 9th two workshops for AfroMAMA and Spider were held in Makerere University as pre conference activities for M4D. 10th and 11th were the actual days for presenting papers and 12th there was a UNICEF workshop.
 - **University of Hertfordshire-** CIT signed a memorandum of understanding with the School of Computer Science, University of Hertfordshire(<http://www.herts.ac.uk/home-page.cfm>) In this collaboration CIT undergraduate students will do their final year with the University of Hertfordshire and then choose which degree to eventually earn, either from University of Hertfordshire or Makerere University.

2.8.2.1.2 G2: Joint ICT Incubation projects- Private Sector: Mbarara University of Science and Technology

Activities for 2009

A GIS workshop for MUST Institute of Computer Science staff was held from 7th -11th December 2009. The facilitator was Dr. Patrick Ogao of Makerere University. During this training some UPDF officers attended and this opened up opportunities to work on a collaborative project on mapping crime.

Activities for 2010

- Mbarara portal was developed and launched on Friday 12th November 2010. In addition, the Institute of Computer Science was contracted by the Mbarara Municipal Council to develop a tool that will support them in activity planning and weekly management reporting.
- Mapping Projects 2010 involved activities on GIS to collect data that can be used in call centers, enhance revenue collection and using GIS for crime mapping. Training of Police Officers and was held in September 2010. The training aimed at inculcating self-sustainability by the police force in regard to crime mapping in their area of jurisdiction.
- Visibility and Promotion strategies workshop was successfully held in October 2010. A team of champions (staff) was enacted and these will work out the Visibility Strategy of the University. A follow up workshop for a team of key faculty representatives was held on 12th November 2010 to look at the draft strategy.
- Company on-Campus visits were held at MUST in October 2010.
- Basic ICT Training skills for staff was held from 22nd November 2010 – 12th December 2010.
- Training for UPDF Officers previously scheduled for November 2010 was postponed to January 2011.

2.8.2.1.3 G2: Joint ICT Incubation projects- Private Sector: Gulu University

Activities for 2008

GIS Laboratory at Gulu University

Using 10 computers from the students' laboratory provided by Nuffic, Gulu University set up a GIS lab in the Department of Computer Science, Faculty of Science in collaboration with the Wild Life Conservation Society (WLCS). Through WLCS and with support from USAID more GIS equipment was procured. These include a map Plotter, a scanner, a printer and four GPS sets. The main objective of the project is "improving the livelihood of the people of northern Uganda through planning, land use management, and conservation of the environment". This objective can be achieved through the use of GIS and GPS sets. Initially, the WLCS has trained 12 (twelve) trainers from the Faculty of Science. The trainers will then train a) Students from Gulu University and b) district officials from the national resource Planning and Environment and Conservation. In short Gulu University is to rollout an outreach program to the community through the trained district officials and students in efficient land use, planning and environment conservation.

Activities for 2009

GIS Laboratory at Gulu University -Wild Life Conservation Society- WLCS/USAID Programming- Training of Gulu University Staff as trainers of Local Government Officials in Environment Action Planning for Post-Conflict Wildlife Landscape of Northern Uganda using Geo-spatial Information. WLCS/USAID and Faculty of Science Gulu University entered a memorandum of understanding and a GIS Lab with 10 computers was set up in the Department of Computer Science. WLCS/USAID donated 10 GPSs and 2 mobile GIS units. WCLS/USAID organized training workshops for Gulu University staff as follows:

- Part B, Module 4: Habitat mapping and modeling training was done from 20th July to 15th August 2009.
- Part B, Module 5: Alternative Land use scenario development using spatial Multi-Criteria Evaluation (SMCE) as a spatial Decision Support (SDS) tool. Training was held from 4th to 15th August 2009.

A GIS workshop on Open Source for Gulu University Staff ran for two weeks from 17th – 28th August 2009, facilitated by Dr. Ogao from Makerere University. The workshop was attended by 23 members of staff who were awarded certificates and several lessons were learnt which included:

- Application of GIS in solving problems in many fields such as Medicine, Crime prevention, Land dispute resolution, education, and Google earth
- Integrating knowledge from different domains
- GIS for business (sales and marketing)

GIS Open source software-Upon Gulu University's invitation, Dr. Patrick Ogao of Makerere University took a mission to Gulu University from 11th to 15th May 2009 and installed the GIS Open source software. He also took off time to meet the PHD candidates from Gulu University.

Activities for 2010

Microsoft- In August 2010, The Department of Computer Science at Gulu University was selected as a Microsoft Academy Centre. Three members of staff are to be trained as Microsoft IT Academy Instructors.

- The Gulu Portal to implement business, product & services in Gulu District was developed and completed in November 2010. The objective of the portal was to establish a sustainable linkage/collaboration with NGO's, Businesses and Government Departments in the District.

2.8.2.1.4 G2: Joint ICT Incubation projects- Private Sector: Kyambogo University

- Cooperation with the Industry- The department of Computer Science entered a partnership with Afroeducare Uganda Ltd in which the latter agreed to engage selected computer science students annually to be given various software development opportunities to solve various challenges in the industry and conduct ICT research.
- Collaboration with Educational Institutions- the Faculty of Science entered into an agreement with Hitech Systems based in Norway to offer training in ICT pedagogical skills to Teachers in schools, Primary teachers colleges and National training teachers Colleges. A memorandum of understanding was signed between Kyambogo University (Faculty of

Science) and Hi-tech Systems Training Ltd (HST) in collaboration with the Danish Research Training centre for education and research and the European Pedagogical Information Communication Technology Centre in the NL. A laboratory of 40 new computers was setup and fully networked. The centre (National and Regional node) was opened in November 2010. Ms. Aguti Beatrice, a beneficiary of Nuffic I was appointed by the University as the Administrative Coordinator.

2.8.2.2 G2: Joint ICT Incubation projects- Public Sector

2.8.2.2.1 G2: Joint ICT Incubation projects- Public Sector: Makerere University

Activities for 2007

MOU with Uganda Police-It was established that the Uganda Police Force has many ICT projects some of which are challenging and require technical support. As a result a partnership was created between the Uganda Police Force and Makerere University Faculty of Computing and IT. A Memorandum of Understanding to this effect was signed between the two parties on 21st December 2007.

Joint Degrees among Public Universities-Public Universities in Uganda have a lot in common; they are set up by Acts of Parliament, are funded by public funds from the consolidated fund and those collected at source. The five (5) public Universities in Uganda are distributed across the country, with Mbarara University of Science and Technology (MUST) in the West; Gulu University in the North, Busitema University in the East; Makerere and Kyambogo Universities in the Central region. At the moment, only Makerere University has PhD holders in the area of computing (computer science, computer engineering, software engineering, information systems and information technology).

During the 1st Coordinators meeting held on 27th August 2007, and the 33rd Coordinators meeting of the project on 'Building a Sustainable ICT Training Capacity in the Public Universities in Uganda' held on 5th October 2007 the project coordination committee discussed the possibility of starting joint PhD and Bachelor's degree programmes. The idea is that each University would first have the programme approved by its Senate and Council. The core courses would be the same for the collaborating Universities with a possibility of allowing other courses to differ in order to suit the needs of each university.

For the joint PhD programmes, all members of staff from the public Universities other than Makerere University planning to undertake PhD training in any of the computing disciplines at Makerere University would be awarded joint degrees. For example for students from Gulu University the degree should be a joint award between Makerere University and Gulu University. Makerere University would provide supervisors and these would be complemented by project staff from the University of Groningen, Radboud University and Eindhoven University of Technology in The Netherlands. Also the students would have access to the computing equipment being put in place under the Centre of Excellence in Computing and ICT at Makerere University.

For the undergraduate degree programmes the following examples were discussed for exploration: B.Sc. in Software Engineering—Gulu and Makerere University; B.Sc. in Information Systems—Kyambogo University and Makerere University; and B.Sc. in Computer Engineering—Busitema, MUST and Makerere University. The idea is that joint degrees provide a training environment that is not possible in a single University setting, allow for optimal sharing of the available resources and discourage duplication of resources/ facilities in pursuit of creating capacity at all partnering universities. Members therefore agreed that it was a very good way of strengthening cooperation and collaboration among the South Partners and the North and South Partners beyond the lifespan of the project 'Strengthening ICT Training and Research in the Four Public Universities in Uganda'. They adopted and took it on to their respective Universities for further consideration.

The Bachelor of Science in Computer Engineering programme started at Busitema University in August 2007 and started at MUST in August 2008. The same programme started at Makerere University (Faculty of Technology) in August 2009.

Activities for 2008:

- **Collaboration with State University of Zanzibar-** On April 11, 2008, Makerere University and The State University Of Zanzibar, Tanzania (SUZA) signed an MoU on cooperation between the two institutions which encompass CIT and the Department of Computer Science of SUZA. This is aimed at collaborating in developing sustainable capacity through collaborations in teaching, research, training, student and staff exchange, transfer of technology and dissemination of knowledge on a long term non-commercial basis.
- **Collaboration with Government of Mauritius-** a MoU between CIT and First Exec Company acting on behalf of the Government of Mauritius was signed on August 8, 2008 on possible external recruitment of IT fresh graduates and professionals to help fill their (Mauritius) human resource gap. The MoU is seen as a first step in understanding and meeting the growing ICT needs of the region. 300 Ugandans IT professional will have an opportunity of working in the Indian Ocean Island of Mauritius.
- **Collaboration with Uganda Peoples Defense Forces (UPDF)-** Under the public partnership arrangement CIT is providing support to Government institutions. In the month of September 2008 [15th – 26th September 2008] CIT provided training in basic ICT skills to 120 Uganda Peoples Defense Forces Army officers. The UPDF has made tremendous strides in automating their processes. We are currently engaged in formalizing our partnership specifically in the area of technical support with the current systems being implemented.
- **Collaboration with Uganda Police Force-** As a follow up implementation of the Memorandum of understanding between CIT and Uganda Police Force reached in 2007, a range of projects with the Uganda Police Force have taken off.

Table 25: Projects Ran under the Collaboration between Uganda Police Force and CIT

Project	Description
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ICT Baseline Survey	The project involved reviewing existing ICT initiatives within the Uganda Police Force departments. The intention was to identify gaps for improvement in areas where computerization has already taken place. At the same time, the baseline study would identify areas that are potential for computerization. The study was completed at the end of March 2008 and a briefing presentation of findings given to the Uganda Police Forces management. Areas for collaboration with CIT will in future be identified from the baseline report.
Fire Arms Database System	The system has three views: (1) the government fire arms; (2) the privately owned fire arms and (3) private security organizations. Work involves the entire software application development life cycle. This means starting from requirements specification, system designing, implementation and testing. Implementation of the project commenced in August 2008 with drafting of the requirements, presented prototype which was approved by the respective units in the force, now finalizing the development to commence on implementation.
Training of 200 Police officers in Office Applications	The Police Force nominated 208 Police officers and CIT trained them in Office Applications using the CCA course content from 21 st July -1 st August 2008. Trainees were awarded certificates at a colorful ceremony held on 6 th August 2008 at CIT. At a later date, more specialized training will be identified and delivered under similar arrangements. Waiting for response from the Force in regard to their special training requirements.
Crime Records Management System	This is a project supported by the American Government. It Includes a component on biometric integration in the system. Training on how the system works was completed in July 2008 and was attended by three staff from CIT. The implementation of this project began in October 2008 and was implemented in conjunction with the American Government. CIT provided support to the project, focusing mainly on system and infrastructure support.
Integration of Sensor Networks in the Traffic Control System	This project involves development of functionality to capture traffic data using sensor networks. The developed functionality is to be integrated into the current traffic control system which is a pre-determined traffic flow system. One PhD Student and two MSc students are undertaking the study under the supervision of Dr. Idris A. Rai. They are at the stage of identifying required components to be procured and Consultations are going on with different stakeholders involved in traffic control administration.
Drafting the ICT Policy for the Uganda Police	This project involves drafting of an ICT Policy document for the Uganda Police in view of the current initiatives to introduce ICT in Police operations. Part of the work will be picked from the results of the baseline survey. The main activities will involve guiding the Uganda Police personnel into writing an ICT Policy that will guide them in planning and budgeting for ICT resources. This work is in progress.

Activities for 2009

- **Burundi Government-**In 2009, CIT went regional in providing community outreach services. On 28th May 2009, CIT hosted the President of the Republic of Burundi H.E. Pierre Nkuruziza who after touring the facilities requested the Faculty to extend a hand of help to the different education institutions and government departments and ministries in Burundi. The invitation was graciously received and to that effect a team of two officials from CIT visited Burundi on a fact finding mission. A report was presented to the Government of Uganda since this was part of the Cooperation Agreement between the Government of Uganda and Government of Burundi.
- **Uganda Police Force-** The Faculty is implementing the MoU that was signed between Makerere University and the Uganda Police Force. The Faculty of Computing and Informatics Technology, accomplished phase one of a project with Uganda Police. This project involved developing a Human Resource System that could help Uganda Police account for all their Police constables by click of a button. The phase two of the project will start in March 2010
- **Ministry of Foreign Affairs-** The Faculty extended its outreach services to the Ministry of Foreign Affairs this year. CIT, accomplished a project with Ministry of Foreign Affairs. This project relates to converging all government foreign missions into one location through one umbrella called www.mofa.go.ug. This web portal will help store, manage and disseminate all foreign missions information more effectively than it has ever been before. This was part of the phase one and phase two of the project will start in March 2010.
- **Ministry of Health/Ministry of ICT- Makerere University** is engaged in an ICT4Manpower Project with the Ministry of Health and Ministry of ICT, Government of Uganda. The aim of the project is to provide Improved Effectiveness of Health Systems and Empowerment of Healthcare Communities in Uganda for Better Health Outcomes of Rural Population using Information and Communication Technologies. Makerere University is supporting this project by providing technical expertise from three key faculties. These are CIT, the Makerere College of health sciences and the Faculty of technology. Through this project capacity will be developed to support the future roll out of the project findings to other districts in Uganda. www.mak.ac.ug
- **Amity University/African Union/Government of India-** Under the Pan-African E-Network Project coordinated by the Ministry of ICT of the Republic of Uganda, the national tele-education learning centre set up at Makerere University Faculty of Computing and IT with effect from 1st August 2009 offered MBA, PGD in IT, Bachelor of IT, and Diploma in IT programmes from Amity University, the leading ICT-based educational provider in India.
- **University of Hertfordshire-** Discussions with the School of Computer Science, University of Hertfordshire(<http://www.herts.ac.uk/home-page.cfm>) are already underway; once completed Ugandans will be able to undertake the following online degrees where teaching and assessment will be completely via e-learning: B.Sc. (Hons) Computer Science; BSC (Hons) Information Systems; M.Sc. Computer Science; M.Sc. Distributed Data Management; M.Sc. Distributed Systems and Networks; M.Sc. e-Learning

Technology; M.Sc. Human Computer Interaction; M.Sc. Mobile Computing; M.Sc. Multimedia Technology; and M.Sc. Software Engineering.

Activities for 2010

- **Ministry of Foreign Affairs-** CIT accomplished a project with Ministry of Foreign Affairs. This project related to converging all government foreign missions into one location through one umbrella called www.mofa.go.ug. This web portal will help store, manage and disseminate all foreign missions information more effectively than has been the case previously. The developed portal became operational on 7th April 2010 and will be commissioned in February 2011.
- **Uganda Police Force-** CIT accomplished a project with Uganda Police. This project involved developing a Human Resource System that could help Uganda Police account for all their Police constables by click of a button. The system was deployed in November 2010 and will be commissioned in February 2011.
- CIT trained more 100 Police officers in Computer Applications Skills for one month from 30th October 2010. The training aimed at boosting the officers so as to undertake their work of keeping law and order within society more effectively. The training was offered on weekends from 08:00 – 17:00 pm.

2.8.2.2.2 G2: Joint ICT Incubation projects- Public Sector: Mbarara University of Science & Technology

Activities for 2007

- The draft proposal on Academia Industry linkages- Information Systems Project for Mayanja Memorial Hospital Mbarara is ready. However MUST is waiting for input from Mayanja Memorial Hospital with whom they will implement the project.
- Mbarara University of Science and Technology Institute of Computer Science also wrote a joint proposal with the Medical School on Community Outreach and MTN has agreed to provide 15,000 US Dollars for the same.

Activities for 2009

- ICT skills training for Uganda Police Officers in Mbarara started on 13th August 09 and ended on 21st August 2009.
- MUST engaged in a project with Uganda Revenue Authority on how to increase domestic taxes through tax education campaigns that would start right with primary schools so that these children grow up well knowing their obligation to pay such taxes as well as them knowing the contribution such taxes make to the economy in such sectors as health, education among others. Computing students will be engaged by the Revenue Authority during their industrial trainings to help in setting up databases.

Activities for 2010

- Mbarara portal was developed and launched on Friday 12th November 2010. In addition, the Institute of Computer Science was contracted by the Mbarara Municipal Council to develop a tool that will support them in activity planning and weekly management reporting.

2.8.2.2.3 G2: Joint ICT Incubation projects- Public Sector: Gulu University

Activities for 2009

- Training of UPDF- ICT training for forty (40) UPDF 4th Division officers took place between November 16th 2009 and November 27th 2009. The ICDL/ECDL syllabus was followed with the intention of improving computer literacy level of UPDF officers. The trainees through their leader, Captain Mugisa expressed their gratitude for having been considered for the training. The officers requested for more of such ICT training especially GIS training. The facilitators were happy with the high level of discipline and eagerness demonstrated by UPDF officers to learn.

2.8.2.2.4 G2: Joint ICT Incubation projects- Public Sector: Kyambogo University

Activities for 2009

ICT and Primary teachers College linkage- There was a workshop from 22nd to 26th June 2009 on the linkage between Kyambogo University and the Primary Teachers Colleges (PTCs) on the introduction of ICT curriculum in these colleges to enable student teachers acquire ICT knowledge and use it when they graduate from these institutions. Muni and Canon Apolo PTCs participated in this workshop.

2.8.2.3 G2: Joint ICT Incubation projects- Open Days

2.8.2.3.1 G2: Joint ICT Incubation projects- Open Days: Makerere University

In 2007, Makerere University Faculty of Computing and IT held its second open day on 11th August 2007. There were special programmes for prospective students, parents, guardians, stakeholders in computing and ICT education, prospective graduate employers and the entire University community. The objectives of this day were to; showcase CIT facilities and the abilities of her students; provide visitors with the opportunity to explore the different programmes offered under the departments in the faculty; provide free consultations with existing students on campus life and their experience at the faculty; provide Students and Parents/Guardians with the opportunity to talk to Careers' advisers; and to incite future possibilities of engaging the relevant private sector companies in Incubation projects. The Day attracted a number of people and organizations. Such organizations included: Ministry of Education & Sports; major Ugandan schools like Gayaza High School, Entebbe S.S, Namityango College, St.Mary's Kisubi, Mengo S.S, & Makerere College; Telecommunication companies like MTN, UTL; Banks like Stanbic Bank, DFCU Bank, other organizations such as DMT Consultants, E-Tech (U) Ltd, HWD Group, Tueze Media, Mengo ICT Team, Octopus, Data Fundi, UNAIDS Khartoum, ICT Consults Ltd; other Makerere Faculties & Institutions.

In 2008, CIT held its 3rd annual open day on 8th and 9th August 2008 under the theme 'Sharing to Empower' and it was run over a period of two days as a response to the feedback received from the previous open day. Participants were from Schools (targeting prospective students), the Industry, Private and Public Sectors. The career guidance session was organized to provide information to prospective students and this was the first time such a session was organized. Students at CIT exhibited a total of 30 projects that were selected from the final year projects that were presented for examination. Projects selected had a strong relevancy to the needs of the business community, training institutions, health institutions and the general public. A number of projects were identified by the business community with the view of developing them to full commercialization.

Students' Exhibitions- In June 2008, 13 students from CIT competed in the Microsoft Regional Imagine Cup 2008 Competition held at the Hilton Hotel, Nairobi, Kenya on 5th June, 2008. The competition attracted 26 projects from nine Universities from Uganda, Kenya and Tanzania. CIT presented 4 projects. Two out of three winning projects were from CIT including the overall winner i.e. Native Green Project- Sensitization of the Public about Environmental Protection (winner) and Land use and Carbon Emission Regulation System (2nd Runner-up).

Makerere University Faculty of Computing & IT students emerged winners at the 10th IEEE students Exhibition 'ICT and Mobile Applications Category'. The event took place between September 11-12, 2008 in Nairobi and attracted universities from Canada, Sudan, Uganda and Kenya. The faculty had 15 exhibited projects out of which two of the top three won the first and third positions respectively. The projects that emerged winners are: A virtual Interactive Campus Map of Makerere University [i-locator]- *winner*, and Online University Application system- *third*.

In 2009, the 4th Open day was held for two days on 21st and 22nd August 2009 in CIT grounds. Unlike the previous events that have been running during the official opening of the University this time round the event was held at the end of the orientation week. Activities included; Career Guidance training and Blood Donation Drive. Zain Uganda was the Principal Sponsor. DFCU Bank and Stanbic Bank participated in the event as exhibitors.

Career/Recruitment Week 2009-The second CIT Career/Recruitment Week 2009 was organized by the Faculty of Computing and IT and held from 1st – 5th June 2009. Its aim was to meet Uganda's IT education and employment needs, where potential employers can meet and interact with students to share, discuss, and explore the opportunities available to the next generation of employees. The event which was organized over five days consisted of two-four hours multiple sessions (morning and afternoon) captured the attention of more than 100 students. The students were exposed to company human resource plans, IT career opportunities, and development of soft skills for the job market.

Students' Exhibitions- Imagine Cup 2009: Development++ team composed of CIT students

(Joseph Kaizzi Kasolo (Team Leader), Kibet Seth Kigen, Acellam Guy, and Okori Ivan Nape) excelled in the Design for Development Award Software Design category that competed in the 7th

Imagine Cup 2009 World Finals in Cairo, Egypt from July 3-7, 2009. More than 300,000 students

from over 142 countries entered the 2009 competition. African Countries that showcased include: Uganda, Senegal, South Africa, Morocco, Tunisia, Ethiopia, and Egypt. For more information please visit: <http://imaginecup.com/>

Emmanuel Ukirwoth- a 1st year student of Bachelor of Information Technology, Makerere University was recognised top student contributor to the IBM Smarter Planet University Jam.

The 2010 open day was held from 20-21 August 2010 at the CIT premises. This open day was well attended by people from both the public and private sector, freshers and continuing students. Several projects were demonstrated to the public in view of showing what exactly is done at CIT. This was the 5th time CIT was running an open day. The activity was coordinated by the office of Corporate Relations at CIT In addition to NUFFIC, Orange Uganda Ltd, Blue Cube Ltd, Stanbic Bank, and Digimation UK also sponsored the event.

2.8.2.3.2 G2: Joint ICT Incubation projects- Open Days: Mbarara University of Science & Technology

In 2007, Mbarara University of Science and Technology held its open day on 24th September 2007 and the turn up was excellent. Invited Guests were: Members of Parliament – Local; The Resident District Commissioner – Guest of Honor; The District L.C.V Chairperson; The Mayor; All Staff Mbarara District Local Government, Town councils; Local Schools and the General Community. Advertisements were made using the Local Radio Station and Newspapers.

In 2008, MUST held its 2nd annual open day on Friday 31st October 2008. Although a success it was suggested that the same be conducted during holidays so that many potential candidates can benefit.

In 2009, the 3rd open day at MUST was held on 27th November 2009. The turn up of prospective students, parents and the entire public was very good.

In 2010, the 4th open day at MUST was held on 27th November 2010. The turn up of prospective students, parents and the entire public was very good.

2.8.2.3.3 G2: Joint ICT Incubation projects- Open Days: Gulu University

In 2009, Gulu University held its ever first Open Day took place on 29th October 2009. The theme was contributing to Community Transformation. The event was officially opened by the RDC Gulu district- Col. Walter Ochola and in attendance were members of the University community. It was

held as a University wide event. Faculties and Departments showcased their works. The event attracted mainly tertiary, secondary and primary school students from the northern region. Local District leaders, the Police, UPDF, business community (mainly banks and Telecom companies) and the local community also attended. The activities of the day were among others:

- Free academic career guidance consultations
- Demonstrations by various Faculties and Institutes
- Provision of services and selling of various project products
- Demonstration of research and outreach activities undertaken by the academic staff
- Demonstration of technologies introduced in the Faculty of Science For example Simple FM Radio, GIS/RS laboratory products etc.
- Opportunity for interactions of weekend and day students from different Faculties and Departments.

In 2010, Gulu University held its 2nd Open Day 20th – 24th September 2010 alongside the National Science Week held at Gulu University. The event aimed at providing career guidance to prospective students in ICT Programmes, demonstrate research and outreach activities and promote the visibility of the Department of Computer Science. The event attracted mainly tertiary, secondary and primary school students from the northern region. Local District leaders, the Police, UPDF, business community (mainly banks and Telecom companies) and the local community also attended.

2.8.2.3.4 G2: Joint ICT Incubation projects- Open Days: Kyambogo University

2.9 Component PM: Project Management, Coordination and Quality Control

2.9.1 PM1: Project Management and Coordination by Ugandan Supervisor & Coordinators and Auditing

Project Management is a day-to-day activity. The Project Management Team in Ugandan was headed by the Overall Project Coordinator, Prof. Venansius Baryamureeba assisted by Dr. Josephine Nabukenya (CIT Ag Dean); Dr. Jude Lubega, CIT Deputy Dean (Graduate Studies and Research) and Project Coordinator for Makerere University; Ms. Peace Buhwamatsiko Tumuheki, the Project Administrator; Ms. Consolate Komugisha, the Project's Financial Officer and Mr. Michael Niyitegeka, the Head Corporate Relations Office at CIT. The coordination team at Makerere University coordinated the project activities in close working relationship with the Project Coordinators at the other universities: MUST- Ms. Theodora Mwebesa Twongirwe, Director Institute of Computer Science and Mr. Stephen Bazirake, Academic Registrar at MUST; Gulu University- Dr. Geoffrey Andogah, Formerly Head of Computer Science Department (now Dean, Faculty of Science) and Prof. Elizabeth Opiyo, Associate Dean, Faculty of Science at Gulu University; and Mr. Henry Matovu, Head of Computer Science Department and Mr. Aaron Wanyama, Dean Faculty of Science at Kyambogo University; and in consultation with the Academic Registrars of these Universities.

The direct involvement of Deans at Kyambogo and Gulu Universities was done as a way of strengthening the coordination capacity at Gulu and Kyambogo Universities in consideration of the institutional challenges at the two Universities.

2.9.1.1 Coordination Committee Meetings

Under this project, Coordination committee meetings were planned to be held every three months.. However, this did not hold depending on the circumstances prevailing. Other than physical meetings, coordination takes place on a daily basis through communication using emails and phones. In addition there are sub-coordination committees that were set up at each University to manage the day today implementation of the project activities and these sub-committees submitted their reports to the main Coordination Committee at Makerere University on a monthly basis. In total 15 meetings were held.

In **2007**, only one meeting was held on 27th August 2007 at Makerere University. This was the first coordination meeting of the project.

In **2008**, four meetings were held as follows: 11th February 2008 at Makerere University; 25th February 2008 at Kyambogo University; 14th August 2008 at Makerere University; and on 19th December 2008 at Mbarara University of Science and Technology.

In **2009** five meetings were held as follows: 27th February 2009 at Gulu University; 30th April 2009 at Kyambogo University; 4th June 2009 at Makerere University; 31st July 2009 at Gulu University and 30th October 2009 at Mbarara University of Science and Technology.

In **2010** four meetings were held as follows: 23rd February 2010 at Kyambogo University; 28th May 2010 at Makerere University; 27th August 2010 at Makerere University; and 1st November 2010 at Mbarara University of Science and Technology.

In **2011**, one meeting was held on 7th January 2011 at Gulu University. This was the last meeting.

2.9.1.2 Mobile Internet Connectivity through GPRS

During the 5th Coordinators meeting held on 19th December 2008, members noted that coordination of the project activities requires dedication from the Coordinators which implies working at any time from anywhere be it at office or at home. As such they suggested that as a way of ensuring provision of dedicated service and strengthening coordination in implementation of project activities it would be gratifying to facilitate the coordination team with the mobile internet connectivity facility. The meeting therefore agreed that: the Dean Faculty of Science and the Head Department of Computer Science at Gulu University; the Dean Faculty of Science and the Head Department of Computer Science at Kyambogo University; the Academic Registrar and the Director Institute of Computer Science at MUST; and the Coordination team at Makerere University (Project Leader/Overall Coordinator, Project Coordinator, Project Administrator and the Financial

Controller) be given MTN mobile internet connectivity through GPRS (General Packet Radio Service) with effect from January 2009.

2.9.2 PM 2: UG Project Coordinator Visit to NL

Under the planned visit to NL in **2007**, Prof. Venansius Baryamureeba travelled to The Netherlands from the 4th - 9th November 2007 and from 4th - 11th December 2007. He was able to visit all the three Universities: University of Groningen, Radboud University Nijmegen and Eindhoven University of Technology and met with all the key persons to discuss pertinent issues on the project: Prof. John Nerbonne; Mr. Erik Haarbrink and Research Leaders of each research group where Ugandan Students are involved among others. He also paid a visit to Nuffic at the end of his second visit.

No official visit by Prof. Baryamureeba as Project Coordinator was made in **2008**. However, he travelled to NL from 13th-16th September 2008 to attend the PhD Thesis Defence of John Ngubiri at Radboud University Nijmegen on 15th September 2008.

With support from Makerere University, Prof. V. Baryamureeba had two visits to NL in March and April **2009** to attend PhD defence for Dr. Josephine Nabukenya and Dr. Benjamin Kanagwa who graduated on 3rd March 2009 and 21st April 2009 respectively, at Radboud University Nijmegen.

With support from Makerere University, Prof. V. Baryamureeba had a visit to NL from 14th -15th September 2010 to discuss and finalise planning for 2010 and 2011 at University of Groningen and Nuffic.

A visit is scheduled for the Project Administrator on behalf of the Project Coordinator to travel to NL on a mission of finalising the Grand Project report after the closing of the Project in May 2011. Tentative dates are 3rd to 17th July 2011

2.9.2.1 Management visit by the Project Finance Officer and Project Administrator to NL

Ms. Consolate Komugisha the Project Finance Officer, and Ms. Peace Buhwamatsiko Tumuheki, the Project Administrator took a management visit to the University of Groningen from 18th -25th October 2009. During the visit they discussed project related matters with the relevant project officers but also held meetings with officers whose work is in line with their main responsibilities at Makerere University and indeed the visit was a great enrichment both in terms of project work and their respective obligations as Faculty Accountant and Faculty Registrar.. They also had exposure to the different information systems related to their offices in the areas of Finance, students admissions, registration and PhD admission and defense. They also had a visit to Radboud University Nijmegen where they interacted with the Project Administrators and the PhD students on the project. They paid a courtesy visit to the Public Relations Office of the University.

2.9.3 PM 3: Project Management, Supervision & Auditing in NL

Prof. Dr. John Nerbonne was the Overall Academic Supervisor of the project/ Chair Academic Advisory Board and is responsible for the overall progress and quality of the project. He worked closely with the Academic Advisory Board comprising of Professors from the Dutch consortium: University of Groningen (Prof. Prof. Dr. Gerard Renardel de Lavelette); Radboud University Nijmegen (Prof. Dr. Ir. Theo van der Weide); and Eindhoven University of Technology (Prof. Dr. Mark van den Brand). The Board advised the Academic Supervisor on PhD research issues and other academic affairs, and mobilized staff from their institutions for project activities. The Academic Supervisor and the Academic Advisory Board received assistance for coordination of all day-to-day project affairs from the project management team at the Office for International Relations of RUG headed by Mr. Erik Haarbrink, Project Coordinator assisted by Ms. Gonny Lakerveld. The Project Coordinator took responsibility for regular liaison between the Ugandan and Dutch partners. The Office for International Relations coordinated all project administrative and financial matters for the project team, and acted as the liaison with Nuffic for the Dutch consortium.

The overall Academic Supervisor and the Project Coordinator met every two weeks to discuss project issues. There was very frequent e-mail contact between the academic supervisor, the AAB members, and the project management team through a standard mailing list. They all met at least twice a year.

2.9.4 PM 4: Project Academic Supervisor and Coordinator Missions to Uganda

In **2007**, Project Coordinator Mr. Erik Haarbrink and Ms. Marieke Farchi visited Uganda from 24th – 31st August 2007 in order to support the Academic Advisory Board in the PhD selection (activity IP2). They also had a project planning meeting with Prof. John Nerbonne and with Ugandan Overall Project Coordinator, Prof. Venansius Baryamureeba. Furthermore, Mr. Erik Haarbrink worked on the project planning document and finalised the inception phase report. Mr. Erik Haarbrink, Ms. Marieke Farchi and Prof. John Nerbonne also paid a courtesy visit to The Netherlands Embassy in Uganda.

In **2008**, the Overall Academic Supervisor- Prof. John Nerbonne and the Project Coordinator Mr. Erik Haarbrink visited Uganda from 1st -5th July 2008 in the framework of the first phase. During this visit they held project planning meetings with the Project management team at Makerere University and discussed among others Project Progress; Supervision of Ph.D. candidates at Makerere; Contact with supervisors in the Netherlands; Planning of courses in 2008/2009; and the visit of Dr. Jude Lubega to the consortium in the Netherlands.

Mr. Erik Haarbrink also visited Uganda from 22nd -26th September for the planning of 2009 and the final report of the 1st phase.

Prof. Nerbonne conducted a second mission to Uganda Oct. 19th -22nd 2008 in order to speak at and participate in the EuroAfrica-ICT Awareness Workshop. (see also 2.4.1) Additionally he made

use of the time to speak to several project participants, including Prof. Baryamureeba, Dr. Jude Lubega, Dr. Idris Rai, Dr. John Quinn, and Dr. Martin Bagaya.

In **2009**, the Overall Academic Supervisor in NL- Prof. John Nerbonne and the Project Coordinator- Mr. Erik Haarbrink visited Uganda from 19th -24th February 2009 on coordination mission. Several issues were discussed during their visit that pertains to the NUFFIC project. These included the status of PhD students, research missions and future monitoring of PhD students on the NUFFIC II project.

Ms. Nicole Flipsen from the International Relations Office at Radboud University Nijmegen- visited Uganda from 9th -18th January 2009 for coordination purposes and other project activities. Some of the issues discussed included the August course in Gender Issues and ICT, Incubation Centre and Research outreach programme- a new activity of allowing undergraduate students on internship to link up with Dutch students to work on feasible projects in Uganda was initiated.

In **2010**, Mr. Erik Haarbrink the Project Coordinator visited Makerere University for a mission from 29th August to 3rd September 2010. His mission was on re-planning of the project for 2010 and planning for 2011.

In **2011**, Mr. Erik Haarbrink the Project Coordinator visited Makerere University for a mission from 11th to 15th April 2011. The main activities of his mission were to finalise progress report 2010 (with UG coordinator), integrate financial statements 2010 Makerere ↔ RUG and calculate balance (with accountant), draw up request for BNE activities beyond May (only NL Ph.D's), prepare set up for final report (to be followed up by visit of UG coordinator to NL in May/june), discuss progress and planning UG Ph.D's, incl finances, set up replanning of NL Ph.D's beyond project end and discuss needs and possibilities of cooperation beyond project.

2.9.4.1 Visit of the Consortium

The Dutch Consortium had a management visit to Uganda from 18th -22nd January 2010. Members of the delegation were: Prof. John Nerbonne University of Groningen (Project Director), Prof. Mark van den Brand, Eindhoven University of Technology, Prof. Theo van der Weide, Radboud University Nijmegen, Prof. Gerard Renardel de Lavalette, University of Groningen; (Academic Advisory Board): and Mr. Erik Haarbrink, University of Groningen and Ms. Gonny Lakerveld, university of Groningen; (Project Coordination team).

The activities of the visit for the consortium were to: Discuss midterm review with management and stakeholders; Adjust planning of activities towards end of the project; Discuss progress and planning of Ph.D students; Supervision of Ph.D. candidates; Advise management and staff on setup of research groups; Facilitate Research Colloquia and advise senior staff; Set up of newsletter; Explore possibilities for student exchange; Discuss cooperation beyond the project; Visit to the other universities Kyambogo, Gulu, and Mbarara.

Prof. Gerard Renardel and Ms. Gonny Lakerveld visited Kyambogo University on 19th January 2010 and held meetings with project coordinators at Kyambogo University and the Academic

Registrar and with the Vice-Chancellor. The meetings mainly discussed the workload of the PhD students, establishing of research groups and possibilities of student exchange.

Prof. John Nerbonne visited Gulu University on 20th January 2010. During the visit he discussed the academic progress of the PhD students from Gulu University. He met individually all the students. He also held a meeting with all staff of the department of computer science at which he emphasized the need to establish and hold regular research meetings.

Prof. Gerard Renardel de Lavalette of University of Groningen and Prof. Mark van den Brand of Eindhoven University of Technology visited Mbarara University of Science and Technology on Thursday 21st January 2010. Meetings were held with the Academic Registrar and the Director Institute of Computer Science. Issues discussed included among others the progress of the PhD students and future cooperation. Prof. Theo van der Weide of Radboud University Nijmegen held meetings in Kampala on the Community Outreach Project and Intel Project.

The delegation had a meeting with the PhD students and with the project management team in separate sessions on 18th January 2010 and a wrap up meeting with the project management team on 22nd January 2010. In addition each member of the delegation had at an individual level separate agenda to execute within the project mandate. By and large the mission was a great success.

2.9.4.2 Visit by Ouindinda Nikiema to Uganda

Mr. Nikiema, a Senior Programme Administrator at the Nuffic Capacity Building Programmes Department in NL came for a monitoring mission in Uganda between 14th and 27th September 2008. The major mission objectives were to monitor ongoing NPT projects and to discuss with relevant stakeholders the overall NPT Programme implementation in Uganda: progress, challenges and the future; and the overall The Netherlands Fellowship Programme (NFP) matters. During his mission he visited Makerere University and Mbarara University of Science and Technology, two of the four universities partnering in the project 'Strengthening ICT Training and Research Capacity in the Four Public Universities in Uganda'. At each visited institution, he held meetings with the concerned project team members and was also taken for a tour of the facilities. The general comment was that the project is progressing well at all fronts.

Ms Margje Geurts of Nuffic visited Uganda for a monitoring mission of the NPT projects in Uganda from 15th to 29th September 2010. She visited the ICT project at Mbarara University of Science and Technology on 17th September 2010, Makerere University and Kyambogo University on Friday 24th September 2010.

Ms Margje Geurts of Nuffic, visited Uganda again for a monitoring mission of the NPT projects in Uganda from March 27-April 5 2011. She held a meeting with Prof. Baryamureeba, Vice Chancellor Makerere University and Overall Coordinator Project Leader of the ICT-NPT Project in Uganda on 29 March 2011.

2.9.5 PM 5: Quality control & advice – mid term evaluation

Within the framework of the NPT project “Strengthening ICT training and research Capacity in the four Public Universities in Uganda” a Quality Control Advisory Board was established to safeguard the quality of project implementation and the relevance of the intermediate and final project results. The Mid-term evaluation exercise was successfully carried out by a three member team (Franciska M.G. de Jong, Henk van Linde, and Khalid A. Mughal) of the Quality Control Advisory Board in the period 3rd -12th August 2009. The overall conclusion of the board was that the project was on track, going well and well received by all the public universities in Uganda. Collaboration between the four universities was excellent. With pleasure the board confirmed that within all four universities new “champions” of the project have come forward who are, each in their own way, making a great impact (**Detailed report in appendix B**).

2.9.6 PM 6: Closing

The project will be closed at an official ceremony on 30th May 2011, at 4:00 pm in Makerere University. The ceremony will be preceded by a workshop of the partnering Institutions both in Uganda and in the Netherlands at 2:00 pm on the same day. (**Report is in appendix C**)

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

The NPT Project 'Strengthening ICT Training and Research Capacity in the Four Public Universities in Uganda' builds on the successes of the NPT Project 'Building a sustainable ICT Training Capacity in the Public Universities in Uganda' which started on 1st July 2004 and ended on 30th June 2008. This project (Nuffic I) has had outputs which have been sustained as follows:

- a. **Developed Curricula-** Expertise was created among the staff of the public Universities and these are the ones responsible for developing new curricula or revising existing ones. From local budgets money is set aside every year for curricula development and review. MUST was able to develop Bachelor of Science in Computer Engineering Programme in 2007 and the programme commenced in August 2008. In 2008, two curricula were approved to be taught at CIT beginning August 2009 i.e. Bachelor of Science in Software Engineering and Bachelor of Information Systems. In 2009, CIT revised all her academic Programmes right from undergraduate Diploma up to PhD programme. The revised curricula were implemented starting in August 2009. In 2010 there was harmonization of course codes.
- b. **Human Resource-** Students who were funded by the project and completed their studies have returned to their mother institutions. The Centre of Excellence at Makerere University now pays salaries commensurate with those in the private sector or Universities in the region and as result it has been able to attract on permanent terms staff who originally came as Visiting staff. The PhD programmes in Computing/ICT at Makerere University are aimed at creating a critical mass of PhD holders in the region. There is already a critical mass of master's holders in ICT in the region. This will minimize staff drain from Universities to the private sector. Makerere University graduates at least 1,000 computing graduates every year. These graduates are very relevant to the private sector as they contribute to stabilizing the ICT workforce in the country and in the region.
- c. **Technical Support-** Makerere University Faculty of Computing and IT has a fully fledged Department of ICT Services that is responsible for maintaining of all the equipment in the faculty. It also provides commercial services within and outside the University. CIT has also established the Department of Software Development and Innovations which provides software solutions to the needs of the private and public sectors. Each of the other Universities (MUST, GU and KYU) has put in place an ICT department to ensure proper functioning of the computing equipment. Makerere University also trains technical staff at different levels and there is enough staff to recruit at any time within Uganda.
- d. **Physical Resources-** Each University has a budget line for computing equipment and infrastructural development. In the past two years, MUST, KYU and GU each have bought at least 40 computers to supplement the 40 computers for the student lab got from the first NPT project. Makerere University Faculty of Computing and IT has bought 1000 additional computers in the past two years. Makerere University Faculty of Computing and IT in the past two years embarked on the construction of the largest computing centre in Africa with support of internally generated funds (tuition fees) and the building was completed and commissioned

on 28th January 2009 by His Excellency Yoweri Kaguta Museveni, President of the Republic of Uganda. All the computing equipment is serviced regularly at all the four public Universities (MAK, MUST, GU and KYU).

- e. **Financial-** Each public University has increased student enrollment and as a result has been able to get more money from government and tuition fees from students on both regular and short courses. This money has been used in ensuring that activities of the project are sustained where money is required to sustain the outputs. For example tuition fees income is used to pay salary incentives to staff that make working in ICT departments attractive to both local staff and regional staff especially the African Diaspora. Makerere University increased tuition fees of all her programmes by 40% with effect from August 2009. Each of the four universities now charges an ICT fee meant to contribute towards maintenance of ICT equipment.
- f. **Research-** MUST, KYU and GU did not have research staff at the commencement of the NPT project. Their staff are currently undertaking PhD training. Makerere University Faculty of Computing and IT had only 4 fulltime PhD holders at the commencement of the project and now has 20 fulltime PhD holders. More staff are currently undertaking PhD training and are expected to finish before end of the current NPT project. So by the end of the project, the Universities will have entered into contract research with the private and public sectors since there will have research staff (PhD holders) in place. The research programme will also be sustained through other donor-funded projects. The staff on the project will retain research linkages with their colleagues in Uganda and The Netherlands.

Therefore the project 'Strengthening ICT Training and Research Capacity in the Four Public Universities in Uganda' (1st June 2007 –31st May 2011) will build on the successes on the above project (1st July 2004 –30th June 2008) and employ sustainability strategies as indicated below.

3.1 Human Resource and Research Development

One of the key outputs of Human Resource and Research Development is human resource with Ph.D. qualifications and strengthened research collaboration between the Public Universities. The measures that will be put in place to sustain this include strengthening the Centre of Excellence in Computing and ICT Training and Research at Makerere University.

One of the planned interventions under the Centre of Excellence is to strengthen 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 that shall use the available PhD holders in Computing and ICT to produce more Ph.D. holders. CIT has in the recent past continued to attract PhD holders both on permanent and temporary terms (visiting staff). Those that have got on Board on permanent terms are: Dr. Jude Lubega from the University of Reading, UK; Dr. John A. Quinn from University of Edinburgh UK; Dr. Idris A. Rai from Lancaster University, UK, Dr. Tonny Bulega from South China University of Technology and Dr. Patrick J. Ogao who previously served as a Long-term Expert on Nuffic Project I and has now has been appointed Associate Professor in the Department of Information Systems. The Faculty continues to host visiting researchers who in addition to the local ones have greatly changed both the ICT human resource and research capacities in the public universities in Uganda.

All the beneficiaries of Nuffic I project 'Building a Sustainable ICT Training and Research Capacity in the Public Universities in Uganda' completed and are back to their respective universities. Dr. Ngubiri was awarded Degree of Doctor of Philosophy on 15th September 2008 by Radboud University Nijmegen. Dr. Josephine Nabukenya and Dr. Benjamin Kanagwa graduated from Radboud University Nijmegen on 3rd March 2009 and 21st April 2009 respectively. Dr. Julianne Sansa and Dr. Geoffrey Andogah were awarded their doctorates by University of Groningen on 21st May 2010 and Dr. Florence Tushabe on 22nd November 2010. Dr. Agnes Rwashana Semwanga completed her PhD training at Makerere University and was awarded Doctor of Philosophy on 19th January 2009. Dr. Rwashana became the first Ugandan woman to complete her PhD studies in Computer Science at Makerere University. Dr. Rehema Baguma successfully obtained her PhD from Radboud University on 13th April 2010. Dr. Gilbert Maiga graduated from Makerere University 22nd January 2010, Dr. Charity Basaza Mulenga in December 2009 from Loughborough University, UK. Ms. Mariam Sensalire, Mr. Benedict Oyo of Gulu University and Mr. Paul Muyinda Birevu (beneficiary of Nuffic II) are due to graduate in January 2011. More staff are in their final stages and will be defending in the near future. These completions will strengthen further the centre of excellence at Makerere University and in other public universities.

Another activity under the Centre of Excellence is joint Ph.D. student supervision and joint research projects. Once there is a critical mass of PhD 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. Some Ph.D. students will continue to follow the PhD by research programme only. In addition to the staff mentioned above, the faculty also receives research staff from outside Uganda institutions whose visits mainly target strengthening research capacity of the academic staff particularly PhD students through talks and workshops. They also keep in touch with these students online after their departure.

In an effort to assist students and staff to be able to publish their research work in international journals, Makerere University registered and publishes a journal, 'International Journal of Computing and ICT Research' [ISSN: 1818-1139' (Print), ISSN: 1996-1065 (Online)]. This journal, which is both online and in print version, 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. As of 31st December 2010, 4 volumes each with two issues; and three special issues have been published.

3.2 Institutional Capacity Development

Makerere University Institute of Computer Science was upgraded into a Faculty of Computing and IT in 2005. In 2009, CIT's establishment was revised to create more support units and increase on academic positions to match the increasing number of students. Service departments such as Department of ICT Support Services, Department of Innovations and Software Development and Corporate relations office were created to provide technical support and strengthen the relations with the private sector. In December 2010 Makerere University became a collegiate university and CIT merged with East African School of Library and Information Science to form a Constituent College of Makerere University under the name 'College of Computing and Information Sciences'. The Department of Computer Science at Mbarara University of Science and Technology was upgraded into an Institute of Computer Science in July 2006. In 2010, ICS was elevated to the status of Institute with departments of Computer Science, Computer Engineering, Information Systems and Technology and Computational Mathematics and Statistics. Plans are underway to

upgrade the Departments of Computer Science at GU and KYU into Institutes of Computer Science. This is a clear manifestation that the Universities and Government recognize the need to finally have Colleges/ Schools/ Faculties/ Institutes of ICT at each public University with permanent structures.

3.3 Annual International Conference on Computing and ICT Research

The Annual International Conference on Computing and ICT Research (<http://srec.cit.ac.ug>) started in August 2005 and will continue every August of each year even when this project has ended. It will continue to 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. This conference will continue to bring together some of the world's most respected authorities in the above disciplines. As a way of sustainability other countries will be allowed to host the conference but maintain the technical committee managed by CIT. Kigali Institute of Science and Technology in Rwanda has already expressed interest to host the 7th ICCIR in 2011.

3.4 North-South Collaboration Programmes

During the project period there will be 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 and these activities are expected to continue after the project completion. The activities will include but not limited to 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. Effective communication between the collaborating institutions will be encouraged.

3.5 South-South Collaboration Programmes

During the project period, institutions in Uganda will identify key areas of collaboration during and after the project completion. These areas include but will not be limited to joint research, joint degree programmes, 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 set up expensive computing facilities that can be used by all the Public Universities and joint subscription to online journals. After the project period, the project coordination committee meetings will be replaced by bi-annual joint workshops. These workshops will be rotational and academic and administrative staff and student representatives will attend. Overall effective communication between the collaborating institutions will be encouraged. In May 2009, a memorandum of cooperation was signed between MUST and Makerere University, in respect of Teaching and Research Collaboration. The two institutions agreed to collaborate in the provision of the academic programmes based in the Institute of Computer Science at MUST and Faculty of Computing and Information Technology at Makerere University. The agreement specifies among others that each academic programme will lead to an award of the University at which it is established; and the students shall earn at least 75% of the graduation load at the degree awarding University. The students at MUST started using the Computer Engineering lab at Makerere University in August 2009.

3.6 Curriculum Development

To sustain quality curricula in Computing and ICT, the project coordination committee will work 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 meets minimum standards. Joint curriculum development workshops and seminars will be encouraged during and after the project period in order to share experiences and best practices.

3.7 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. Again during and after the project period, joint workshops and seminars on ICT Policy and Master Plan Reviews will be conducted to ensure that the existing policies are at par with the developments in Computing and ICT.

3.8 Gender Balance

During the project period, policies that promote gender balance in both the number of academic staff as in the number of students will be developed and adopted by the respective universities. Policies focusing on recruitment of staff (both academic and administrative) and students will be reviewed. Also sensitisation workshops will be conducted as annual events even after the four years of the project.

3.9 Staff Exchange Programmes

Staff exchange programmes will be encouraged across all the four Public Universities in an effort to maintain a levelled / common teaching and research strategy standard. Makerere University is already sending its staff as visiting fellows at the other three public universities in the area of Computing and ICT.

3.9 Desktop Publishing Unit

Although it was not possible to procure a desktop publishing unit under the project plans are underway to procure one which will help generate information on ICT in terms of Handbooks, Conference Proceedings, Brochures etc. These will be sold to Universities at a subsidized fee. More funds will be generated through advertisements run in Supplements, Flyers and Calendars. Funds raised through these activities will cater for operational costs incurred in running the facility.

3.10 ICT Incubation Projects

A lot of research has been undertaken by universities but for various reasons it has not been absorbed by the private sector. One of the reasons could be that the research output of the Universities is not relevant to the needs of the private sector. Therefore the approach now has been changed to first contacting the private sector to give Universities problems to solve. These problems will then be worked on in form of incubation projects and then solutions will be provided to the ICT Companies. At the start Universities will do it for free but as the companies gain confidence in them, they will start funding them. These projects will boost collaborations between the private sector and ICT departments at the Public Universities. Funds generated from these projects will be used by departments to advance in their research capacity. The National Software

Incubation Centre set up at CIT has already realised tangible fruits in this area of ICT Incubation projects.

To enhance public –private sector partnerships, all the public universities agreed that it is important to set up public relations offices to spear head this activity. The model has worked so well at CIT and once this is effected at all the universities, it will be very easy to sustain the partnerships created during the project period.

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 National Software Incubation Centre

The Rockefeller Foundation provided the seed grant of USD 300,000 for the establishment of the software incubation facility at CIT. The Project started on 1st January 2008 and ended on 31st March 2009. Nevertheless the activities are ongoing. The NSIC is supported by the Department of Innovations and Software Development (DISD) at CIT. DISD focuses on the growth of software conception, design and development capacity at CIT. In this project DISD worked very closely with the NSIC to accomplish the objective of developing capacity in software development by developing software packages required by private and public sectors both within and outside Uganda.

The NSIC project was conceptualized primarily to address the current shortage of proficient developers in Uganda and in the region. Using the seed grant provided by Rockfeller Foundation, planned computing equipment and relevant software were procured to start the project. Following the set criteria, 100 novice developers were recruited to undertake training in software development. Out of the initial 100 novice developers recruited 82 certified the requirements of the

centre and were awarded certificates at the closing of the final dissemination workshop held on 5th February 2009. The centre has continued to recruit young graduates and spin off companies are already in place.

Spin Off Companies

One of the objectives of the project 'Strengthening ICT Training and Research Capacity in the Four Public Universities in Uganda' was to strengthen relations and collaboration among the universities and ICT industry and the government. One of the targets under this objective was that by the year 2011 there would be at least 10 spinoff companies from ICT incubation centers based at Universities. Some of the graduates of the National Software Incubation Centre (NSIC) have set up companies. As shown in the table below.

Table 26: Some of the Spin Off Companies started by NSIC Graduates

	Company Name	Products	Location	Contacts
1	Netcom Services Uganda.	<ul style="list-style-type: none"> • Web designing • Build information systems and other database systems • Computer repair and maintenance 	Talemwa Towers, Ground floor Block 773 Kabakanjagala Road, Mengo.	P.O. Box 30046 Kampala Tel: 0782807040 0782048434 Email: netcomuganda@gmail.com mawandaj@yahoo.co.uk
2	Skybizsolutions Ltd	Information and Communications technology services: <ul style="list-style-type: none"> • Local Area Network (LAN) configuration: • Software development • Hardware maintenance: • Website Hosting: • IT Consultancy • Online marketing 	Plot 25, Nasser Road Kampala, Ateka Building 1 st Floor	Email: admin@skybizsolutions.com Business Website: http://www.skybizsolutions.com Social Website: http://www.ug311.com Tel: +256-714-141-161
3	Nego Technologies Ltd	<ul style="list-style-type: none"> • Networks and preventive maintenance • Outsource IT services Application development • Buying and selling Computers and 	Majestic Plaza, Kampala Road, Level 4 Shop 5	victor.ogen@gmail.com

		computer accessories <ul style="list-style-type: none"> • Reconditioning old computers, laptops and computer accessories 		
4	Cotam Technologies Ltd	<ul style="list-style-type: none"> • Software Development for both Computers and Mobile Devices (Phone and PDA) • Networking • Computer Repairing and Maintenance • Website development • Business Management Consultancy 	Khan Building, Along Sir Apollo Kaggwa Road Opposite Small Gate Makerere University	P.O. Box 16424 Wandegaya Tel: 0414667171

.4.2 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]

4.3 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>

4.4 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.

4.5 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.

5.0 Project Success Stories

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

In the application for the award of the project “Strengthening ICT Training and Research Capacity in the Four Public Universities in Uganda”, it was proposed that a Quality Control and Advice Board – consisting of three independent experts – would be used to give their expert opinion on the mid-term results and the overall course of the project.

Two experts from The Netherlands – Prof. F.M.G. de Jong (University of Twente) and Dr. H.J. van Linde (former director of SURF Foundation) - and one from Norway - Dr. K.A. Mughal (University of Bergen) - were appointed to this board. They paid a visit to Uganda in the period 3rd -12th August 2009 to undertake a mid-term review based on relevant project documents and on meetings with various parties/individuals connected with the project in The Netherlands and Uganda. A three member team (Franciska M.G. de Jong, Henk van Linde, and Khalid A. Mughal) of the Quality Control Advisory Board carried out a mid term evaluation of the project in the period..

The overall conclusion of the board was that the project was on track, going well and that was well received by all the public universities in Uganda. Generally, they were very impressed by the synergy generated between the four universities involved; ICT within the universities in its broadest sense was getting an enormous boost and most parts of the project had been implemented already to a great extent.

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 Institute of Computer Science was upgraded into a Faculty of Computing and IT in 2005. In 2009, CIT's establishment was revised to create more support units and increase on academic positions to match the increasing number of students. Service departments such as Department of ICT Support Services, Department of Innovations and Software Development and Corporate relations office were created to provide technical support and strengthen the relations with the private sector. In December 2010 Makerere University became a collegiate university and CIT merged with East African School of Library and Information Science to form a Constituent College of Makerere University under the name 'College of Computing and Information Sciences'.

The Department of Computer Science at Mbarara University of Science and Technology was upgraded into an Institute of Computer Science in July 2006. In 2010, ICS was elevated to the status of Institute with departments of Computer Science, Computer Engineering, Information Systems and Technology and Computational Mathematics and Statistics.

Plans are underway to upgrade the Departments of Computer Science at GU and KYU into Institutes of Computer Science. This is a clear manifestation that the Universities and Government

recognize the need to finally have Colleges/ Schools/ Faculties/ Institutes of ICT at each public University with permanent structures.

5.3 Administration Capacity Development

The project has also greatly enhanced the administration capacity at the public universities. The coordinators/beneficiaries of the project have moved to higher levels of responsibility as follows:

5.3.1 Makerere University

- The Overall Coordinator and Project Leader in Uganda-Prof. Venansius Baryamureeba who previously was the Director ICS and then Dean CIT is now the Ag. Vice Chancellor of Makerere University.
- Dr. John Ngubiri also a beneficiary of the project has moved from being Head of Computer Science to Deputy Dean Academic Affairs at CIT and now to Deputy Principal for the College of Computing and Information Sciences.
- Dr. Josephine Nabukenya a beneficiary of the project is the Dean, School of Computing and Informatics Technology.
- Ms. Peace Buhwamatsiko Tumuheki, the Project Administrator, formerly Registrar Faculty of Computing and Informatics Technology is now the College Registrar, College of Engineering, Design, Art and Technology.
- Ms. Consolate Komugisha, the Project Financial Officer, formerly Accountant Faculty of Computing and Informatics Technology is now the Ag. College Bursar, College of Computing and Information Sciences.

5.3.2 Gulu University

Dr. Geoffrey Andogah a beneficiary of the project has moved from being Head Department of Computer Science to Dean of the Faculty of Science at Gulu University.

5.3.3 Mbarara University of Science and Technology

- Dr. Pamela Mbabazi formerly the Dean of Faculty of Development Studies and also a leader of a Nuffic Project at Mbarara University-Faculty of Development Studies is now the Deputy Vice Chancellor of MUST.
- Ms. Theodora Mwebesa Twongyeirwe, Director of Institute of Computer Science at MUST was appointed member of Uganda Revenue Authority Board of Directors in an instrument dated June 15th 2010.

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 coordinators from all the four Public Universities, 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 implementation 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 Overall Academic Supervisor of the project/ Chair Academic Advisory Board and Academic Advisory Board comprising of Professors from the Dutch consortium: University of Groningen (Prof. Prof. Dr. Gerard Renardel de Lavelette); Radboud University Nijmegen (Prof. Dr. Ir. Theo van der Weide); and Eindhoven University of Technology (Prof. Dr. Mark van den Brand). The day today operations of the project were attended to by the Office for International Relations at Groningen under the guidance of Mr. Erik Haarbrink, the Project Manager/Coordinator.

6.2 Table 27: 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 'Strengthening ICT Training and Research Capacity in the Four 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 educational programmes implementation, development of research capacity, training of staff of the four universities at PHD level in ICT either in The Netherlands or in Uganda; strengthening of a center of excellence for computing and ICT training and research at Makerere University, development of ICT infrastructure at the four public Universities in Uganda, promotion of gender balance in staff and students population, enhancing ICT awareness and promotion among the policy makers and the general public and in general institutional development.

Indeed the outputs of this project are enormous. There is no single doubt that the capacity of Makerere University Faculty of Computing and Informatics Technology, 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 has been strengthened. With the progress made so far on PhD training, ICT human resource capacity at all the four public universities will be sustained. The Educational programmes have been strengthened, there is a joint research programme in place, the ICT and teaching infrastructure at the four public universities was greatly strengthened, the centre of excellence in computing and ICT at Makerere University is strengthened, there is gender balance in the number of students as in the number of staff participating in ICT/Science and Technology, the relations among the universities, ICT industry and the government and among the public universities have been greatly strengthened.

8.0 Statement of approval

May 2011

Prof. Venansius Baryamureeba
Overall Coordinator & Project Leader in Uganda
Makerere University
Uganda

Prof. John Nerbonne
Overall Academic Supervisor
University of Groningen
The Netherlands

9.0 Appendices

Appendix A: Tracer Study Report

Appendix B: Mid-term Evaluation Report

Appendix C: Proceedings of the Closing Ceremony of Nuffic I