Strengthening Higher Education Stakeholder Relations in Africa;

Case-Study of Makerere University College of Computing and Information Sciences

By

Michael Niyitegeka[[1]](#footnote-1); Makerere University

Roch Glitho (PhD)[[2]](#footnote-2); Concordia University

Table of Contents

Contents

[Summary 1](#_Toc337158343)

[1.0 Introduction 2](#_Toc337158344)

[2.0 Background to the study 3](#_Toc337158345)

[2.1 Contextualizing Higher Education Stakeholder Relationships 3](#_Toc337158346)

[2.2 Industry-Academia Relationships 3](#_Toc337158347)

[2.3 Industry Research & Development as a pre-cursor to Industry – Academia Relationships 4](#_Toc337158348)

[2.4 The ICT Sector in Uganda 4](#_Toc337158349)

[3.0 Championing Industry-Academia Relations: The Corporate Relations Office 5](#_Toc337158350)

[3.1 The Stakeholder Engagement Framework 7](#_Toc337158351)

[3.2 Skills Transfer Stakeholder Engagements 9](#_Toc337158352)

[3.2.1 National Software Incubation Lab; 9](#_Toc337158353)

[3.2.2 Translation of Google and Mozilla Web browsers 10](#_Toc337158354)

[3.2.3 Mobile Applications Lab 11](#_Toc337158355)

[3.3 The Value of a CRO in Industry-Academia Relationships 12](#_Toc337158356)

[3.4 The Feedback Survey 12](#_Toc337158357)

[4.0 Constraints and Challenges 14](#_Toc337158358)

[5.0 Research Output & Faculty Engagement 15](#_Toc337158359)

[6.0 Gender & Environment Issues 16](#_Toc337158360)

[7.0 Funding and Sustainability Issues 17](#_Toc337158361)

[8.0 Lessons Learnt & Concluding Remarks 17](#_Toc337158362)

[References 26](#_Toc337158363)

# Summary

The demand for graduates that are ready to work right out school is challenging Higher Education Institutions to go an extra mile to deliver superior graduates. One of the avenues of achieving this is through encouraging and strengthening Higher Education Institutions’ (HEI)[[3]](#footnote-3) Stakeholder Relations. Stakeholder(s) are individuals or groups who have an interest or some aspect of rights or ownership, who can contribute in the form of knowledge or support, or can impact or be impacted by an institution (Bourne; 2008). Whereas in the developed world HEI’s have established stakeholder relationships and structures, that does not seem to be the case in most African HEI’s. The lack of structured, established stakeholder relationships does have an impact to an extent on the quality of education and product out of the education system.

Makerere University is one the Africa’s HEIs that has established a structure to engage and manage her stakeholders. The Corporate Relations Office, which is mandated to foster industry-academia relationships. To date, a number of partnerships are on-going, and these include but not limited to: (i)Translation of Mozilla Firefox and Google Browsers into local languages -- a project that involved working with Google and Mozilla;(ii) Establishment of a software incubation lab, supported and funded by the Rockefeller Foundation, this lab has enabled the interaction between student software developers and seasoned developers through a mentorship program; (iii) A Mobile Computing Lab, a multi-stakeholder-supported lab that has received equipment from Nokia and Google to support mobile applications development. Nokia has recently trained 70 mobile application developers to develop mobile applications for their online store; and (iv) Supporting the Government of Uganda through Capacity Building Initiatives. These relationships have brought value to our core mandates i.e., teaching and learning; research and innovations, as well as knowledge transfer partnerships. The key learning that has come out of the existing relationships is that the industry is changing rapidly and academia is not moving in tandem. Not being in tandem implies that the graduates from our program will lack the appropriate skills and as such will not find the jobs they seek. Strong industry-academia relationships have enabled Faculty to keep an ear to the ground and respond to any gaps within the means available. One strategy we have used is to invite industry representatives to deliver the specialized courses for specialized skills that are required, as with Nokia supporting training for mobile applications development.

This case-study will exhibit the value of establishing stakeholder relationships where they do not exist or strengthening them where they loosely exist. Feedback from both Makerere University faculty[[4]](#footnote-4) and stakeholders will be shared regarding their perceptions about the value derived from the relationships. Key lessons learned from the ongoing relationships will be presented to share insights about stakeholder relationships.

The case-study will evaluate the existing literature on the subject of stakeholder relationships and particularly on Industry-Academia relationships, which form the basis for this case-study. The review will scan through the Higher Education in Africa, the state of Research and Development in Africa and in Uganda in particular. HEI’s are in most cases positioned as Research Centers and as such will attract substantial amounts of R&D resources if they are available. Industry-academia relations will tend to be incentivized with the availability of R&D budgets within the industries. It is therefore envisaged that this case-study will provide insights that will demonstrate the need for strengthening HEI stakeholder relationships as well as the need for having appropriate structures to initiate, manage and support these relationships.

# Introduction

Freeman (1984) defines a “stakeholder” as an individual or group of individuals either impacted upon by a company or able to impact on the achievement of its objectives. Similarly, the 1998 Eden and Ackerman study (Bryson, 2004) identifies stakeholders as individuals or groups that have the power to directly impact the future of an organization. This is the concept underpinning Stakeholder Theory. This theory considers that the final results of any activity should take into consideration the returns of the results for all stakeholders involved and not only the results for owners or shareholders (Alves, Mainardes & Raposo; 2010). Stakeholder relationships, by implication, mean the relationship between entities that has mutual benefits, and these relationships are characterized by mutual inter-dependence (Alexander, Mieseng, & Parsons; 2005).

This case-study is structured into three major sections: background information, which presents the foundation of the case-study broadly, based on an understanding of Higher Education in Africa; contextualizing of HEI stakeholder relationships; and understanding the role played by investments in R&D as a stimulus for stakeholder relationships, and in particular that role in Uganda. The purpose of the background information is to enable the creation of a common understanding regarding the dynamics that influence HEI stakeholder relationships and, particularly for this case-study, industry-academia relationships. The engagement model that has evolved from the on-going partnerships over time is presented. Four specific “stakeholder partnerships” that are currently on-going form the basis of this case-study. Key findings of the survey, carried out with faculty members and partners, are shared and lead to key lessons that are observed.

The development of this case-study made use of a multi-pronged methodology; a review of existing literature was undertaken to inform and form the foundation, and documentation of the existing processes and partnerships of the Corporate Relations Office was undertaken in order to acquire the specifics of the case-study. The study sought input from the partners and the intention was to demonstrate the value being derived from the existing relationships.

## 2.0 Background to the study

## 2.1 Contextualizing Higher Education Stakeholder Relationships

Higher Education has undergone major changes which are a result of the changes that are taking place in the external environment. The requirement to fully understand the needs of consumers is more pronounced than ever before. Jongbloed, Jürgen and Salerno (2007) state that “the legitimacy of higher education to society is increasingly evaluated by the level and quality of the HEI commitment to its community of stakeholders and is inherently of greater depth than any simple maintenance of contacts. It rather means that the organization seeks out and adopts the means of involving the stakeholders so as to best perceive how the latter value the services provided and just how these can be improved.” The community of stakeholders is increasingly playing an active role in the validation process of the products that are being released by the HEIs, and this does have an influence on the operations of a given HEI.

The challenge remains, however, as HEIs have not yet proven able to either correctly identify the stakeholders involved with institutions or to concretely establish the needs of each entity and the level of importance to attribute to the respective relationship. There is still much to be done before it will be possible to ensure that HEIs meet stakeholder needs. Stakeholder Theory has much to contribute towards completing this task (Dobni and Luffman, 2003).

Research on the relationships between HEIs and their stakeholders remains recent and exploratory, with the majority of studies only featuring conceptual approaches -- adapting theories from other fields to explain this dimension, which is still relatively unknown to both academics and those responsible for university management (Alves, Mainardes & Raposo; 2010).

## 2.2 Industry-Academia Relationships

The focus of this document is the Industry-Academia relationship as a subset of stakeholder relationships in HEIs. A good definition for a healthy academia-industry relationship could be that an academia-industry interface is characterized as an interactive and collaborative programme between academic institutions and industrial sector for the attainment of certain reciprocally beneficial purposes and missions (Nagaya & Pramanik; 2011). As stated by Jalote (<http://www.iiitd.edu.in/~jalote/GenArticles/IndAcadCollab.pdf>) “the common interaction model between academia and industry is that of producer-consumer – a relationship that has existed for a long time between the two sides. This relationship necessitates collaboration, as the consumer has to ensure that the output of the producer satisfies the needs to a large extent. Hence, one form of collaboration, which is more in the nature of a feedback loop, is for the industry to provide inputs back to the academic institutions regarding their perception or evaluation of their products.”

Academia-industry collaboration has long been a topic of discussion on both the sides, yet there is still no model that is widely used. This is largely attributed to legitimacy issues, i.e., who has the right to complain or validate the others’ product or service. Meanwhile, industry can legitimately raise issues regarding the quality of graduates who are not able to meet the basic skills requirements. Academia on the other hand, believes they have a noble cause in imparting knowledge from a holistic approach. It is largely a debate between function and form, industry keen for functional knowledge with academia (in most cases) insisting on form. For example, the goal of research is to create new knowledge; the purpose of research in a company is to create new knowledge which other parts of the company can use to improve the business (Jalote; <http://www.iiitd.edu.in/~jalote/GenArticles/IndAcadCollab.pdf>). To enable the co-existence of the two entities there needs to be a paradigm shift in the attitude and approach in order to obtain the desired results.

## 2.3 Industry Research & Development as a pre-cursor to Industry – Academia Relationships

One of the major incentives for Industry-Academia relationships is the presences of Research and Development in industry. HEIs endeavor to globally position themselves as research centres and as such tend to attract partnerships. Whereas this is the normal trend, in Africa it is still in its very early stage; with the exception of a few fairly industrialized countries like South Africa and Egypt, Research and Development is still low. The weak domestic R&D capability, and in many cases the absence of institutional mechanisms that provide explicit incentives to investors to target knowledge-based and intensive activities hinders or restricts opportunities for collaboration (Mugabe 2004). Investments in R&D in Africa are limited and this can largely be attributed to the nature of the existing businesses and industries. With the largely service sector businesses and cottage industries that require minimal value addition, R&D is not a priority. Where it has been possible to have access to R&D funds, it has been through donor agencies, and to a limited extent, governments. In these cases the funds are availed under contractual obligations with clear expectations from the funder. According to the Global Investments in R&D report (UNESCO; 2011) the distribution of R&D expenditure in terms of Gross Domestic Expenditure on R&D for Africa was 0.9% in 2007, compared to 23.1% for the European Union and 32.6% in the United States of America. For the entire African continent this represents a miniscule level of investment. The figure would be even worse if South Africa, Egypt and North Africa were eliminated.

## 2.4 The ICT Sector in Uganda

The ICT sector in Uganda is overshadowed by Telecommunications, Internet and Infrastructure portion, with less attention paid to applications development and deployment, IT Services, and training, among others. This is largely attributed to the fact that there has not been a comprehensive study of this sector in some time -- the latest having been undertaken in 2004 (Kartono, James & Musisi; 2004). This situation makes it very difficult to appreciate the growth of the sector. The latest report (Mulira, Kyeyune & Ndiwalana; 2010) largely discusses telecommunications and the Internet, with limited mention of the other aspects of the sector: hardware, software, and service providers. It is also true that the sector is largely in its infancy on the whole, except for the telecommunications sector and to an extent the communications sector i.e. radio and TV. The other major players in the market are the NGO’s, which are involved in the development and deployment of applications. These tend to invest substantial amounts in the development of local solutions, although not very much is done to commercialize such solutions. The major players in the sector, telecommunications or otherwise, are multinational players, whose R&D function in most cases tends to reside in the country of origin. There are no policies in place that compel such players to contribute to the growth of R&D in Uganda and this has a direct implication on the growth of the R&D in the sector.

The ICT sector in Uganda is still growing rapidly, and a number of players are entering the market. The last three years alone has seen the establishment of companies like Microsoft, Google, and Hewlett Packard in Uganda, companies that have very strong industry-university linkage strategies in their home countries.

# 3.0 Championing Industry-Academia Relations: The Corporate Relations Office

The CRO at Makerere University started operations informally in 2007 as a backdrop support function to the Rockefeller Foundation’s initiative establishing the National Software Incubation Lab. The Rockefeller Foundation provided a grant of USD 300,000 to establish the National Software Incubation Lab. During the same period, the Netherlands government through its funding agency NUFFIC provided a grant for Strengthening ICT Training and Research Capacity in the Four Public Universities of Uganda. That project provided funding for Strengthening Private-Public partnerships in Uganda and in the region for the four public universities of Uganda, with Makerere University taking a pivotal role in supporting the other universities. These two projects provided the requisite foundation for the establishment of the CRO thanks to the provision of supporting funding to support the activities of the office during the inception phase.

**About Makerere University**

Makerere University is the pioneer Public University in East Africa established in 1922 (www.mak.ac.ug) and has made significant contributions to the planning and growth of Uganda through the training of appropriate human resources, and more importantly in the development of national strategies and priorities that have a correlation with human development.

The Current Strategic Plan 2007/08-2017/18 seeks to establish Makerere University as a leading Higher Education Institution in Africa.

In 2009, Makerere University initiated a reformation process. The reformation process was two pronged; (i) review of academic programs and structures and (ii) administrative reforms. Under (i) all academic programs were reviewed and re-aligned. In 2010 the University transformed itself into a collegiate university with 8 constituent colleges. 21 Faculties, Institutes and Schools were merged to form eight constituent colleges. As such CIT merged with the East African School of Library and Information Sciences (EASLIS) to form the College of Computing and Information Sciences (CoCIS). CoCIS ([www.cis.mak.ac.ug](http://www.cis.mak.ac.ug)) is made up of two schools i.e. School of Computing and Informatics Technology ([www.cit.mak.ac.ug](http://www.cit.mak.ac.ug)) and East Africa School of Library and Information Sciences ([www.easlis.mak.ac.ug](http://www.easlis.mak.ac.ug)).

College of Computing and Information Sciences (CoCIS) was established and gazetted under the Ugandan laws in the Uganda Gazette of Friday 30th December 2011 Vol, CIV No.76; by Statutory Instrument No. 68 in accordance with section 29(1) of the Universities and Other Tertiary Institutions Act, 2001.

The Corporate Relations Office was created in March 2008 as a project under the Faculty of Computing and Informatics Technology (CIT). In 2009, the CRO was formally established and recognized as part of the university structure under CIT in the revised establishment structure for CIT. The core responsibility of this office was to provide oversight coordination of all engagements that the Faculty of Computing and Informatics Technology had at that time. The CRO started off with one person and has since grown into an office with an established staff of six, plus three student interns.

Figure 1: The CRO Organogram

Figure 1 depicts the structure within which the CRO currently operates, indicating the strategic emphasis of the office to communicate both internally and externally. The CRO facilitates stakeholder engagement by ensuring that there is clarity of purpose and intent amongst the parties.

The CRO plays a significant role, providing an interface between industry and academia, and has since been established as a point contact for any engagements that involves both the public and private sector in Uganda and beyond. Since its inception more than 15 Memoranda of Understandings (MoUs) have been signed, with 60% of these still active.

The presence of the CRO provides stakeholders with a one-stop liaison point to engage and interact with the faculty and students. Currently both the inbound and outbound engagements are largely handled by the CRO. Both engagements are motivated by a need that requires a solution to be provided by leveraging on the capabilities of the stakeholders.

It is important to note that majority of the engagements that have been sustained are with stakeholders that are multinational corporations, which for the most part have strong university collaborations and established Research and Development functions in their home countries. This is not the case with local companies because the majority of them lack sufficient funds for Research and Development. The engagements with such local entities in some cases are spontaneous and purely activity-based. To engage these stakeholders, an outreach approach is used, where the college invites them to partner on a particular initiative, in many cases on a pilot basis, with the hope that this engagement will be scaled up by the partner depending on their interest and the projects’ success. It is important to note in the last year we have seen the number of local stakeholders increase -- a very good indication indeed.

## 3.1 The Stakeholder Engagement Framework

Over the past few years, a framework of engagement has been established. This has grown out of the routine processes during the process of engagement. In every engagement, the point of focus is the activity that is to be undertaken, with clear engagement plans based on the expectations of the stakeholders involved. The activities define the level of engagement and resources required as well as the as the extent of engagement, i.e. whether it is short term or long term. For inbound[[5]](#footnote-5) engagements, the capability and competence of the team at the college is critical to ensure success and sustainability. The CRO is charged with enabling the establishment of the institutional framework of engagement, specifically, with having the MoUs and contracts in place. The diagram below illustrates the engagement framework:

Stakeholders (Public-Private) MNC, NGO, Government

Identified Activities

Engagement plan established

CRO (Needs & Opportunities Identified)

Implementation of activities

Establishment of Institutional Framework

Identification of Resources

1

2

3

4

5

6

7

8

Figure : Engagement Process at CoCIS

9

Stages one to five are dependent on initiatives between the stakeholders and the CRO which would be regarded as the initiative level. Stages six to eight have significant institutional requirements and required compliance. Stage 9 emerges in some instances where the partners want to try out a potential partnership without going through formal engagements. It is at the initiative level where an investment is made in clarifying the opportunities that the entities can have a stake in. It is imperative to have an ear to ground and keep in touch with what is happening in the sector, and this requires time and effort to continually package the college as a potential partner. Like any sales process, it is important to understand whether the potential partner is a willing one and has been considering seeking such a partnership opportunity. Identifying the point contact in the other organization is crucial in completing the engagement process. The CRO invests substantial amounts of time identifying and understanding the potential value contribution to various partners. As has been alluded to earlier, it is easier to engage multinational corporations and international agencies because in their value chain, universities already play a significant role. From a strategic dimension, the CRO endeavors to demonstrate the strategic value of engagement to local industry, and this process is beginning to pay off.

For a meaningful stakeholder engagement, it is important that expectations are clearly stated from the onset to enable and ensure a successful project for all. The CRO does the initiation and processes steps five to seven, which are crucial in getting the engagement formalized. These three steps are where the details are finalized and ensure that institutional interests are safeguarded.

At the University level, the Planning and Development Department is designated to handle advancement and to a certain extent, stakeholder engagements, although there is minimal visibility of the same. Stakeholder engagements are recognized as critical but there are no adequate supporting structures to ensure that these engagements do indeed take carried out. In fact, we have had situations where a stakeholder has pulled out because of the number of mini-processes and the amount of time required to complete the formalization process. To overcome this challenge, a point person has been designated to do the follow up with the different departments that are charged with ensuring that the formalization process is complete. This has greatly improved the time it takes to complete the formalization process.

Over the past four years the CRO has been able to initiate and attract partners with different interests. Table 1 shows the current partners, their sector, areas of interest and whether they have entered into a formal (MoU) engagement or not.

Table 1: Current Industry Partners

|  |  |  |  |
| --- | --- | --- | --- |
| Organization | Sector | Area of Interest | Formal Engagement (YES/NO) |
| Orange Uganda Ltd | Business | Mobile Applications DevelopmentStudent InternshipsJoint project collaborations and implementationSupport of Research & Development | Yes |
| Google Uganda | Business | Student mentorshipFaculty Research Support and GrantsCurriculum developmentTechnology infrastructure support | Yes |
| Microsoft Inc | Business | Innovation Support through the Microsoft Innovations CentreResearch & Development Support through research grantsStudent mentorship through challengesTechnology infrastructure support | YES |
| Grameen Foundation | Not for Profit | Student mentorship and training through internshipsJoint project development and implementationCapacity building through annual software development boot camp (JAMS)Research and Development (joint undertaking) | YES |
| Security Risk Solutions Ltd | Business | Professional training support in IT SecuritySupport to the IT Security Research GroupIncome generation through offering paid courses | YES |
| NFT Consults Ltd | Business | Student support services through the established Career CentreCareer mentorship support to faculty and studentsParticipation in curriculum review and development | YES |
| Hewlett Packard Uganda | Business | Student InternshipsTechnology infrastructure supportFaculty research grant support | YES |
| Nokia East Africa | Business | Curriculum and training supportStudent mentoring Technology infrastructure support | NO |
| Uganda Police Force | Government  | Technical support and advisory services to the forceCapacity building for police officersJoint development of applications for the force | YES |
| National Information Technology Authority of Uganda | Government  | Capacity building of the citizens of UgandaBusiness process outsourcing training partnership National ICT Research Agenda implementation partnershipStudent mentorship and internships | YES |
| UNICEF-Uganda | Not-for Profit | Student mentorshipTraining support  | NO |
| Random Hack of Kindness | Not-for-Profit | Joint hosting of eventsStudent mentorship and training Student skills challenges | NO |
| International Telecommunications Union | Not-for-Profit | Capacity building and skills developmentTechnology infrastructure supportR&D support | YES |
| E-Tech Uganda Ltd | Business | Student mentoring and trainingInvolved in running code-camp competitionsSupport in the identification of partners | NO |
| Four Public University in Uganda (Mbarara University of Science & Technology, Gulu University, Busitema University and Kyambogo University) | Government | Capacity building and skills development supportJoint project implementation Resource and facilities sharingJoint curriculum development and delivery | YES |

## 3.2 Skills Transfer Stakeholder Engagements

Over the last four years the CRO has engaged a number of stakeholders. The strategy for these partnerships has been stakeholder-led so as to encourage future and ongoing engagements. This case study therefore focuses on skills transfer and uses three examples to demonstrate how it has evolved. Three specific stakeholder engagement examples – two software development laboratories and a major translation project -- are presented to demonstrate the value of these engagements.

### 3.2.1 National Software Incubation Lab;

The National Software Incubation lab (NSIL) was established with a grant from the Rockefeller Foundation of USD 300,000 in 2007 and became operational in 2008. The initial funding was for a period of one year. The NSIL was established to spur the local software economy through partnerships with existing local and international organizations. Part of the funding was used to procure 120 computers to equip the software incubation lab. The project facilitated the process of bringing on board seasoned software developers; individuals and organizations in the business of developing software. Students with a passion for developing software for business were targeted and invited to apply. The top applicants were accepted into the program, which operated for a period of six months. Almost a hundred students enrolled (and 72 successfully completed) the program, developing applications and undergoing training in business-related topics. A unique aspect of this project was the involvement of industry players as mentors. Under the mentorship program, both organizations and individuals were enrolled to support the project. The schematic flow of the process is exhibited below:

A key aspect of these initiatives was the ability to bring real business challenges that require solutions into the learning process. The business community has become our partner in the learning process because they make it possible to connect life practice and academia. Faculty members who are part of the mentoring team learn from the business community how the knowledge that they are sharing with the students can be applied. These symbiotic relationships make our products (graduates) more valuable to the business community. . We envisage that once the start-up companies begin making profits, they will be in a position to invest back in our programs

Figure 3 demonstrates the process that was involved in the NSIL. A total of 15 products and companies were created. A number of products were adopted by the private sector for commercialization. To date, the NSIL continues to enroll students and has strong partners who come on board to mentor and groom the next generation of developers.

Figure : Schematic Process Flow of NSIL


### 3.2.2 Translation of Google and Mozilla Web browsers

The translation of the Mozilla and Google Web browsers was a community outreach engagement. In 2008, a team from the University of Rhodes in South Africa visited Makerere University to kick-start and participate in the translation of the Mozilla Firefox browser. The Makerere University Faculty of Computing and Informatics Technology played a pivotal role, organizing and coordinating the processes. Strategic partners with expertise in Luganda were identified, as this was the language into which the browser was to be translated. (See info box on page X.)The Institute of Languages of Makerere University, the Kingdom of Buganda, and the Uganda Broadcasting Corporation were brought on board as subject matter experts of the Luganda language. The team from the Faculty of Computing provided the technical support of inserting the translated texts into the backend strings of code. After three years this set of coordinated teams produced a fully translated Mozilla Firefox browser. The Luganda version was officially launched by the Prime Minister of Uganda in October 2012.

Firefox translated into Luganda 

|  |
| --- |
| Mozilla Firefox has steadily increased its share of the web browsing market |

**African software and language experts have launched a project to translate Mozilla's Firefox web browser into the local Ugandan language of Luganda.**

The project aims to increase the number of non-English speakers using computers particularly in rural areas of Uganda. If successful, Firefox will be the first computer program to have been translated into Luganda. About five million Ugandans speak Luganda, the most widely spoken language after English and Swahili.

**Basic words**

The initiative to translate Firefox into Luganda is being led by Uganda's Makerere University, South Africa's Rhodes University and Translate.org.za, a non-profit organisation.

The BBC's Joshua Mmali in Kampala says 120 software engineers and 120 language specialists were invited to a two-day workshop to collaborate on the project this week.

So far, some basic words have been translated into Luganda, our correspondent says.

Venacious Baryamureba, the dean of Makerere's Faculty of Computing and Information Technology, said the project would increase the number of people using computers in Uganda. "Everything is available in English and there are people who know Luganda, who can read Luganda but cannot read English. So it's a step towards localising most of these things into local content," he said.

Our correspondent says Ugandans are looking forward to using Luganda and other local languages to search for information on the internet.

Microsoft launched its Windows and Office software in Kiswahili (Swahili) - which is spoken by more than 110 million people across eastern and central Africa - in 2005.

Language experts from Kenya, Uganda, Tanzania, Zanzibar as well as the Great Lakes and the Democratic Republic of Congo developed a common glossary for the software.

**Source: http://news.bbc.co.uk/2/hi/7560742.stm**

The Google Localization team based in Nairobi approached the Makerere University Faculty of Computing and Informatics Technology in 2009 to support the translation of the Google browser into the three main dialects in Uganda i.e. Luganda, Luo, and Runyakitara. The team from Computing used the same model as in the Mozilla Firefox browser translation. The Institute of Languages provided the technical expertise in translating the browser terms. As this would be an enormous project, training was undertaken to create the necessary foundation to enable full participation and coordination.

### 3.2.3 Mobile Applications Lab

Mobile devices are the most widely-used computing devices in Africa. Given this reality, the Faculty of Computing and Informatics Technology sought support from Nokia to establish the Mobile Computing Lab. Nokia provided 20 high-end programmable phones (N-90 series in 2008), which made it possible to offer training in mobile applications to students and to others with an interest in developing mobile applications. Out of this initiative, mobile computing courses were introduced into both the graduate and undergraduate programs. However, this effort was largely academic, with very little impact on the amount of content available on the Nokia Ovi Store. Nokia has since developed content with regard to offering short-term Java Mobile Applications Development training, and provided a training grant to support the offering of this program. The purpose of this training is to provide those interested in mobile applications with the training and an opportunity to acquire skills to develop mobile applications. Sixty-seven students underwent the training and a total of 17 mobile applications were developed over the 17-week training period. This training was offered in the first and second quarter of 2011. One unique value of this partnership was that Nokia, which had both developed the content and was willing to offer it as part of their training grant, also made its certification process available to the student developers, along with offering to market and promote the mobile applications thereby developed on their Ovi store at no cost to the developers. One of the students who participated in this program has developed six mobile applications, all available on the Nokia Ovi Store (see highlighted box).



Abdu Ssekalala (Bachelor of Information Technology Student; Final Year) participated in the Nokia Mobile Application training program

Developing apps for the Ovi store wasn't easy at the start. I had a ton of ideas for apps but didn't really know how to turn them into products. During the Nokia Java training, I chose to develop a sports app called Whirlsports that would pull in sports news feeds, league statistics, fixtures, betting tips and so much more, but I later realized that not all the features I wanted for my app could fit into a small app. At the time, the Android buzz was catching on and most of my friends suggested that I abandon creating apps for Nokia and instead create android apps… but I persisted.

Three months down the road I had a fully featured working app ready to be deployed to the Ovi store. Deploying the app onto the Ovi store wasn't an easy task. The app failed the Quality Assurance test about five times before eventually being published. After successfully published Whirlsports, I chose not to stop there. I ventured further to develop a Symbian-based web app dictionary called Wordbook and a Nokia Series 40 web app translator called tutu translate. I also went further into developing themes for Nokia devices and currently have two themes on the Ovi store, with the Uganda theme being the fourth most downloaded theme at the moment with over 6,000 downloads per day. In total I currently have five items on the Ovi store (3 apps, 2 themes) with another app currently in the QA testing phase and hopefully to be published next week. Of the six content items available on the Ovi store two are commercial items. Each of these costs USD1 per download.

The training program enabled the students to develop their products through normal software development procedures and a validation process. The training format was much different than the usual academic setting, as the students were required to have an application concept approved before they could commence the training. The concepts could only proceed after approval by the Nokia team in Nairobi. The timelines were strict and had to be adhered to. Before an application could be published, it had to meet Nokia’s Quality Assurance standards. This exposure was a real-life learning experience, and a number of students could not get through this last step until till the end of the program.

## 3.3 The Value of a CRO in Industry-Academia Relationships

Having in place an office that is charged with engaging various industry sectors and facilitating the engagement process is key to attracting and retaining partners. A point of contact is crucial for enhancing and strengthening the relationships, both internal and external. The CRO has positioned itself as a gateway to the community, as well as for connecting industry and academia. Over the last three years we have observed growing consistency on the part of partners, and as confidence, trust and relevance are strengthened, more mutually beneficial value is being derived for the engaging partners. Members of staff and industry partners attest to the fact that having a point of contact for the industry-academia partnerships creates a symbiotic relationship that enables all parties to benefit from the relations. The CRO has a critical responsibility of nurturing the relationship from the onset and overseeing its growth.

### 3.4 The Feedback Survey

To better understand how industry-academia partners have actually perceived the Corporate Relations Office, a survey was sent to a total of 15 industry partners, and thus far, seven have returned the survey instrument. Of those that responded, only 43% had a formal engagement (i.e. a MoU) with the college. However, it is important to note that some of the most active partners, i.e., those that participate in most of our activities, are those with no formal engagement. The survey sought to analyze and quantify the engagements that the partners have with the college, and the responses (to date, of just seven of the smaller companies) are presented in the table below;



Abdu Ssekalala (Bachelor of Information Technology Student; Final Year) participated in the Nokia Mobile Application training program

Developing apps for the Ovi store wasn't easy at the start. I had a ton of ideas for apps but didn't really know how to turn them into products. During the Nokia Java training, I chose to develop a sports app called Whirlsports that would pull in sports news feeds, league statistics, fixtures, betting tips and so much more, but I later realized that not all the features I wanted for my app could fit into a small app. At the time, the Android buzz was catching on and most of my friends suggested that I abandon creating apps for Nokia and instead create android apps… but I persisted.

Three months down the road I had a fully featured working app ready to be deployed to the Ovi store. Deploying the app onto the Ovi store wasn't an easy task. The app failed the Quality Assurance test about five times before eventually being published. After successfully published Whirlsports, I chose not to stop there. I ventured further to develop a Symbian-based web app dictionary called Wordbook and a Nokia Series 40 web app translator called tutu translate. I also went further into developing themes for Nokia devices and currently have two themes on the Ovi store, with the Uganda theme being the fourth most downloaded theme at the moment with over 6,000 downloads per day. In total I currently have five items on the Ovi store (3 apps, 2 themes) with another app currently in the QA testing phase and hopefully to be published next week. Of the six content items available on the Ovi store two are commercial items. Each of these costs USD1 per download.

Table 2: Partnership Activities

|  |  |  |
| --- | --- | --- |
| Activities |  | % |
| Recruitment of Student Interns |  | 43% |
| Project Implementation |  | 29% |
| Project Partnership |  | 29% |
| Recruitment of graduate students |  | 14% |
| Joint hosting of events |  | 29% |
| Use of University facilities |  | 43% |
| Community Engagement Partnerships |  | 43% |
| Guest Lecturer |  | 0% |
| Project/Student mentor |  | 14% |
| Curriculum Review |  | 14% |
| Others |  | 0% |

 It is evident from the table that recruitment of interns, the use of university facilities and community engagement partnerships had the highest number of responses. *The College has one the best computing facilities in the country and as such will tend to attract a number of entities who want to use the facilities. For the college, making its available to its partners is a strategic move because it brings them to the University, and in most cases, our students and faculty directly benefit from the activities.* In many cases it is a condition that our students must be able to benefit from any partnership project. Project partnerships and their implementation follow, and as more activities are undertaken even more projects tend to follow. On a scale of 1-5 (1= being lowest and 5= highest) the partners were asked to rate whether their engagement with the college has been of value to their businesses. The chart below shows that the majority of the responding partners confirm that the partnership has been valuable to their businesses. This demonstrates that academia can have a positive influence on the operations of businesses if the relationship is properly structured.

Chart 1: Value to Business



 When asked if they believed they have directed contributed to the fulfillment and execution of the mandate of the college, again using a rating of 1-5, a majority of the partners believed they had directly contributed to the fulfillment and execution of the mandate of the college, with 59% rating their contribution at 4 and 29% at 3.

On being asked whether the corporate relations office had achieved its core function of fostering relationships between industry and academia, 71% of the partners confirmed that this had been achieved. It was important to know if they would recommend the establishment of a similar office in other colleges, and all the partners responded in the affirmative

In their own words, this is what some of the partners said about the value of the Corporate Relations Office

The office has made it smooth for Security Risk Solutions to have an MoU with the College ***(Security Risk Solutions)***

Great value because the staff always keeps us posted about the activities at the College ***(CIPESA-Regional NGO***

A one-stop shop for university relations. ***(Grameen Foundation)***

It has considerably raised the profile of the college and departments within. It has been highly supportive of fostering relationships between itself and the IT community ***(E-Tech Uganda Ltd)***

**CRO Feedback Dashboard**

The survey also sought the views of the members of the Faculty of Computing staff about their perceptions with regard to the Corporate Relations Office and its role of fostering industry-academia relationships. On a scale of 1-5 (1=Lowest rate and 5=Highest rate) 90% (4=50% & 5=40% respectively) of the staff believed that the CRO had achieved its core expectation of fostering relationships between academia and industry. With this level of satisfaction, not surprisingly 80% asserted that they would recommend the establishment of a CRO in other colleges. More than 70% of the staff members affirmed that the CRO contributes to the mandate of the college, which is similar to what the industry partners had stated. It was imperative for the survey to know whom the faculty regarded as stakeholders, and the results are shown in the table below:

Table 3: Stakeholder Rating

|  |  |  |  |
| --- | --- | --- | --- |
| Government |  | 5 | 50% |
| Makerere University |  | 6 | 60% |
| Students |  | 8 | 80% |
| Alumni |  | 0 | 0% |
| Private Sector |  | 5 | 50% |
| Parents |  | 0 | 0% |
| Community |  | 3 | 30% |
| ICT Sector in Uganda |  | 5 | 50% |

It is evident that students are regarded as the major stakeholders at 80%, and then Makerere University (employer) follows at 60%. This means that to an extent, the consumer of our product (graduates), i.e. the private sector, does not possess significant visibility in our operations. This has an implication on how we package our services and products. It was also important to know the most significant contribution of the Corporate Relations Office to the functioning of the college. The table below presents the responses, which are in tandem with the core mandate of the CRO.

Table 4: Perceived function of the CRO by University Faculty

|  |  |  |  |
| --- | --- | --- | --- |
| Marketing the college |  | 6 | 60% |
| Initiating partnerships with stakeholders |  | 6 | 60% |
| Bringing industry mentors to work with students |  | 4 | 40% |
| Exposing students to opportunities |  | 6 | 60% |
| Providing a link between Industry and the College |  | 8 | 80% |
| Representing the College at different fora |  | 4 | 40% |
| Community engagement and partnerships |  | 2 | 20% |

Overall the responses from the survey are positive and affirm the contributions of the Corporate Relations Office in fostering Industry-Academia relationships. We now can state that value is definitely perceived as resulting from these engagements, value that both entities have been able to realize.

# 4.0 Constraints and Challenges

A number of constraints and challenges have been encountered by the CRO as it has progressed in its mandate. The constraints and challenges are both structural and functional and originate from both sides of the engagement equation; some excerpts of these constraints and challenges are listed here:

1. **Lack of awareness about CRO activities:** being a relatively new initiative within the University and in the industry sector, the creation of engagements has been a challenge. Makerere University does not have an established Advancement office, and thus at the institutional level support structures are lacking, which does limit awareness to a certain extent.
2. **Lack of R&D Functions:** most of the local companies do not have an established functioning structure for R&D. Research uptake is limited and this limits the opportunity for engagement.
3. **Infant ICT Industry:** the ICT industry in Uganda is still in its infancy, and this is both a challenge and a constraint. Contrary to the multi-national corporations which have established structures, local companies are short on budgets as well as structure.
4. **Limited Financial Resources:** for the CRO to fully undertake its tasks there must be an investment in the processes of engagement. Makerere University, like many public institutions, is struggling with funding challenges and this cripples the ability to advance.
5. **Limited Human Resources:** currently, the CRO is at the level of a department, with a staffing of 10. However, only one person is fully involved in the activities of Corporate Relations. The others provide support roles, such as Communications Officer and as Web-administrator. This constrains the ability to scale up and to provide supervisory support functions to the existing engagements.

# 5.0 Research Output & Faculty Engagement

One of the key outputs of these engagements has been research publications and conference proceedings, as well as a variety of presentations. The publications document the practices and experiences that have been acquired during the processes of the engagement period. Research also presents learning experiences for faculty as well as the wider body of academia that has access to these publications. To the faculty participating in these engagements the publications are a demonstration of academic and career growth. In addition to these publications, participating faculty acquire skills that sharpen their ability to apply knowledge in the real world. These engagements on the whole provide substantial value to the multiple stakeholders involved in a particular engagement. The table below exhibits the research publications per activity/project;

|  |  |
| --- | --- |
| Activity/Project | Publication Author & Title |
| National Software Incubation Lab | Hugh Cameron, Benjamin Kanagwa and Michael Niyitegeka; (2012); A Software Business Incubation Model for Sustainable Economic Development in Uganda; Paper Presented at the 3rd International Conference on Mobile Communication For Development (February 27-29 2012); <http://cit.mak.ac.ug/downloads/SBI-Africomm2011camera-ready.pdf>F. Tushabe, P. Jehopio, V. Baryamureeba, P. Bagyenda  and C. Ogwang (2008): ``**The Status of Software Usability  in Uganda**'', Proceedings of the International Conference  of Computing and ICT Research, August 3, 5th 2008,  Kampala, Uganda. Pgs 1-11, ISBN 978-9970-02-871-2; <http://cit.mak.ac.ug/iccir/?p=iccir08> |
| Translation of Google and Mozilla Web Browsers  | F. Tushabe, V. Baryamureeba and F. Katushemererwe  (2010): ``**The Translation of the Google Interface into  Runyakitara**'', Proceedings of the International  Conference for Computing and ICT Research, Aug 1-4 2010, Kampala, Uganda. Pgs 236-245, ISBN 978-9970-25-015-8; <http://www.cit.mak.ac.ug/staff/tushabe/Runyakitara.pdf>TUSHABE, F. 2008. “Translation Of Mozilla Firefox Into Luganda” Technical Report of the Faculty of Computing and IT, Makerere University <http://cit.mak.ac.ug/staff/tushabe/mozilla.html> |
| Mobile Computing Lab | DEARDEN, Andy, LIGHT, Ann, KANAGWA, Benjamin and RAI, Idris (2010). Getting from research to practice in M4D. In: SVENSSON, Jakob and WICANDER, Gudrun, (eds.) Proceedings of the 2nd International Conference on M4D Mobile Communication Technology for Development: M4D 2010, 10-11 November 2010, Kampala, Uganda. Karlstadt University, 259-262. <http://shura.shu.ac.uk/3537/1/M4DDeardenetal.pdf> |

# 6.0 Gender & Environment Issues

Makerere University is one of the first universities in Africa to embrace gender equality. In 2009 a Gender Policy was established that brought together all the initiatives that had been implemented or in the pipeline ([www.**gender**.mak.ac.ug/downloads/Mak**GenderPolicy**Juluy09[1].doc](http://www.gender.mak.ac.ug/downloads/MakGenderPolicyJuluy09%5B1%5D.doc)). Tremendous achievements have been recorded in the area of gender equality with establishment of special recognition efforts to ensure that both male and female have fair access to resources and services. Girls accessing university education at Makerere University and other public universities are given bonus points through government policy to make them as competitive as their male counter parts. This has increased the number of females accessing university education. In the last five years the percentage of females graduating has ranged between 35- 48%, and these numbers are significant. The University has an established Gender Mainstreaming Directorate that oversees the implementation of gender-related activities in the different academic units (<http://gender.mak.ac.ug/>). In our Computing School the situation is far better than in similar units in other African universities. Four out of five administrative positions are held by women i.e. Dean, & three Heads of Departments. In the department of Information Systems, 11 of the 16 filled positions are held by women (<http://cit.mak.ac.ug/isstaff.html>), and in the department of Computer Science six of the 17 filled positions are held by women (<http://cit.mak.ac.ug/csstaff.html>). In the Computing School, 40% of the scholarships are allocated to female faculty, and this has led to the increase in the numbers that join as faculty. The School has an establishment of 40% female and this is bound to improve with the expected completion of the current PhD student’s number nine completing in 2012. On the student enrolment, our enrolment policy has enabled more female students to enroll on the computing disciplines. Female student enrolment stands at an average of between 43-47% and this is attributed to the fact that the admission requirements allow both science and humanities based subjects for admission consideration. Fortunately on the stakeholder engagement projects, majority of the projects have had a very strong gender equality requirement and this has seen more female faculty participate.

Environmental concerns are pertinent in the execution of the all of the projects. All partners and funders have strict standards on environmental matters and as such we are required to comply. However, it is important to note the government is developing an e-waste management policy to safe the population and the environment. The Public Procurement and Disposal Authority ([www.ppda.go.ug](http://www.ppda.go.ug)) has very strict guidelines on how they dispose of obsolete equipment. With regard to this case-study, all the activities we have undertaken to date have had minimal effect on the environment. Because of lack of sufficient resources and infrastructure disposal of equipment and other related equipment has not followed standard environment procedures. Lack of policies that put at the fore the safeguard of the users at risk is a major concern. For example standards for donated equipment hardly exist until the recent ban on used computer hardware Uganda had become a dumping ground. This is exacerbated by the lack of sufficient resources to acquire equipment that is fit for human use and also to dispose after its life span. CoCIS has attempted to replenish computer hardware every 3years depending on the availability of funds. Focus is on functionality of equipment and not lifespan and thus equipment is used until it has become expensive to use because of continuous breakdown.

# 7.0 Funding and Sustainability Issues

The CRO operates a very lean structure, and its related expenses are integrated into the main budget of the university. The biggest recurrent expenditure is staff salaries but these are not a direct responsibility of the CRO but rather of Makerere University. The CRO is largely a support function and as such it is supported by the core activities of the university. In the last financial year, funds amounting to about USD 70,000 were allocated for activities related to branding and marketing, including stakeholder engagement events such as corporate breakfasts as well as the other related activities. This amount has, however been reduced to about USD 45,000 for the next budget. Every project or activity implemented under the CRO must assume the administrative costs associated the activity. This is one way to safeguard the CRO from further budget issues.

# 8.0 Lessons Learnt & Concluding Remarks

Investing in relationship building is a tedious process that requires a dedicated team. The return on investment tends to take a long time, but they do provide yields for a long time period. HEI’s in Africa must deliberately invest in and commit resources to ensuring that these engagements take place. It takes time for industry to realize the value of engagements with academia, especially since the culture of R&D is not strong or even a part of the organization nomenclature. HEIs in Africa must package themselves as worthy partners who add significant value to the value chain process of the industry. This also means that the academic world must develop and show substantial interest in what industry partners (or future partners) are currently doing and what value they attach to what they are doing. It is by showing how academia can add value to what an industrial partner values that their attention will be attracted for a mutually engaging relationship. It is also important to note that it is not a matter of merely having a point of contact, but that Industry-Academia engagements must be aligned within the structures of the HEI.

For sustainability purposes it is important that the establishment of a CRO is sanctioned and integrated in the mainstream function of its university. Ad-hoc establishments too often have limited long term implications with regard to sustainability. The CRO now has an established vote on its budget under the Public Relations division. All staff (with the exception of two contract employees) in the department are on fulltime tenure and thus their salaries are borne by the university. A minimum of approximately USD 40,000 is committed to our activities on an annual basis.

Each of the partnerships has presented interesting lessons and it is these lessons that provide the foundation for stronger and more fulfilling relationships. The table following (Appendix I) exhibits the lessons that have been learnt and the actions proposed for further and future engagements.

In concluding, we need to emphasize that stakeholder relations in HEIs are not as straightforward as they ought to be. This is primarily due to the different concerns and priorities of industry and academia, and it is clear that they value their separate existence. It is important that industry and academia seriously regard their co-existence in their value chains, and structures should be established at both ends to ensure successful and meaningful stakeholder relations. This case has ably demonstrated that having in place a point of contact, here embodied in the Corporate Relations Office, has elevated the value of the relationship and as such is continuously attracting more partners. The more partners that come on board, the more the credibility ratings improve. Strong Industry-Academia relationships are a sign of mutual trust and credibility.

Strengthening HEI stakeholder relations in Africa is therefore a move in the right direction if African HEI’s are to compete favorably in the competitive marketplace. The demands from the industry are increasingly becoming more and more dynamic and fast and thus it is imperative that strategic relations are established to foster mutual continuous improvement.

Appendix : Project Matrix

|  |  |  |  |
| --- | --- | --- | --- |
| Project | Benefits from the Partnership | Lessons Learnt | Future Actions |
| National Software Incubation Centre | * Infrastructure (Computer Hardware and Software)
* Mentoring of students by practicing software developers
* Business incubation-15 start-ups have been registered
* Enables the students to acquire business skills like business presentation, marketing and sales and financial literacy
* The centre acts as an extension of the Department of Innovations and Software Development and undertakes consultancy software development projects
* Attracts training partners who run training programs that out students benefit from
* Raises the profile of college
 | * Lack of venture capital fund providers inhibits business start-ups
* Industry partners are willing to invest their time in mentoring the next generation of software developers
* Just as with any start-up, it takes time to be accepted and trusted, so it is important to start with limited expectations from the industry
* The start-ups struggle to survive and many times the owners go into other employment to subsidize their business
* The university funding structure does not provide for supporting start-ups and/or business incubation
 | * There is need for support structures at the national level for start-ups
* There is a need to re-align the centre to become an innovations centre as opposed to only focusing on software development
* Streamlining the funding stream of the centre to ensure continuous flow of funds
 |
| Mobile Applications Lab | * Infrastructure (Mobile Devices –Nokia and Google)
* Attracted a number of partners in the mobile space (Orange Uganda, SMS Media, Text to Change among others)
* Over 20 mobile applications have been developed
* 67 students received training from Nokia under their Mobile Applications training module
* The lab is attracting partners in the industry who are keen to develop mobile applications
* The mobile computing and applications development research group is taking root at CoCIS
 | * It is important to keep the relationship simple to enable other partners to come on board. Avoid exclusive relationships as much as possible
* The demand for mobile applications is growing and so it is important to have integrated teams while developing applications
* Most developers focus on technical issues with limited attention on functionality issues, which has direct implications on usability
* Commercial applications are difficult to commercialize, especially in a cash economy with limited electronic payments
* Less than 20% mobile devices in use nationally are generic and cannot run certain applications
 | * It is important to undertake comprehensive reviews of the mobile applications required by the community
 |
| Translation of Google & Mozilla Firefox Browser | * Partnership with the community
* Students who participated have formed a company to continue the translation efforts
* Inter-disciplinary teams established involving individuals from the Languages section, software developers, and others
 | * Translation efforts are predominantly voluntary and therefore there is no incentive in the long run
* Content in the local language is limited on the web
* Language experts are limited and many of them are commercially-oriented (charge for their services)
 | * Developing content for the web in the local languages
 |
| Supporting Government of Uganda ICT Initiatives | * Partnership with government agencies in developing appropriate applications
* One application (Human Resource Management System) developed and deployed at the Police Headquarters
* 300 Police Officers trained as part of social responsibility
 | * Limited ICT applications in government
* Limited technical expertise in government inhibits the continuity of the projects implemented
 | * Develop an ICT Strategy for the government departments
 |

# References

Alves H., Mainardes.W.E., & Raposo.M. (2010); A Relationship Approach to Higher Education Institution Stakeholder Management**;** Tertiary Education and Management ; Volume: 16, Issue: 3, Publisher: Routledge, pages: 159-181 accessed via <http://www.mendeley.com/research/a-relationship-approach-to-higher-education-institution-stakeholder-management/> on 28th January 2012

Alexander, C., Miesing, P., & Parsons, A. (2005). How important are stakeholder relationships? *Academy of Strategic Management Journal, 4*, 1-7. Accessed via [www.albany.edu/~pm157/research/**stakeholders**.pdf](http://www.albany.edu/~pm157/research/stakeholders.pdf) on 7th February 2012

Bailey. T, Cloeti N., & Pillay P. (2010); Universities and Economic Development in Africa; Case Study of Uganda & Makerere University; Capetown Center for Higher Education Transformation.

Benneworth, P. and Arbo, P. (2006) ―Understanding the regional contribution of higher education institutions: A literature review. Paris: OECD/IMHE.

Bourne M. L. (2008); Stakeholder Relationship Management Maturity; Presented at PMI Global Congress; 19th – 21st May 2008 St. Julians Malta; accessed via <http://www.stakeholdermapping.com/PDFs/SRMM_Paper.pdf> on 1st February 2012

Bryson, J. M. (2004): ―What to do when stakeholders matter: stakeholder identification and analysis techniques‖, Public Management Review, Vol. 6, no. 1, pp. 21-53.

Carpenter, T.W.Jr., Koenig.I.J, Bilbe.Q,and Bischoff. S.,(2004); At Issue: A Model for Academic/Industry Collaboration; ***Schizophrenia Bulletin,* 30(4):997-1004,2004. Accessed via** [http://schizophreniabulletin.oxfordjournals.org/content/30/4/997.full.pdf on 1st February 2012](http://schizophreniabulletin.oxfordjournals.org/content/30/4/997.full.pdf%20on%201st%20February%202012)

Dobni, C. B. and Luffman, G. (2003): ―Determining the scope and impact of market orientation profiles on strategy implementation and performance‖, Strategic Management Journal, Vol. 24, no. 6, June, pp. 577-585.

Freeman, R. E. (1984): ―The politics of stakeholder theory: some future directions‖. In: Dienhart, J. W. (org.): Business Ethics Quarterly, Vol. 4, no. 4, accessed via <http://www.sogra.pt/ficheiros_artigos/stk.pdf> on 5th February 2012

Kartono, James and Musisi; (2004), ICT Investment Opportunities in East Africa; Country Specific Market Analysis Uganda; International Finance Corporation accessed via <http://www.trigrammic.com/downloads/new2005/Uganda%20Report.pdf> on 7th February 2011

Laredo, P. (2007): ―Revisiting the third mission of universities: toward a renewed categorization of university activities?‖ Higher Education Policy, Vol. 20, no. 1, pp. 441-456.

Jongbloed, B., Enders, J. & Salerno, C. (2007): Higher education and its communities: interconnections and interdependencies in higher education. Looking forward: Themes on the Changing Relationship between Higher Education and Society; European Science Foundation.

Jalote.P.; (Not Published); Challenges in Industry-Academia Collaborations; accessed via [http://www.iiitd.edu.in/~jalote/GenArticles/IndAcadCollab.pdf on 6th February 2012](http://www.iiitd.edu.in/~jalote/GenArticles/IndAcadCollab.pdf%20on%206th%20February%202012)

Makerere University (2008) *Makerere University Strategic Plan 2008/09‐2018/19*.

Kampala: Makerere University

Makerere University (2008) *Makerere University Research and Innovations Policy*.

Kampala: Makerere University

Mulira N., Kyeyune A., & Ndiwalana A.; (2010); Uganda ICT Sector Performance Review 2009/2010; Towards Evidence-Based ICT Policy and Regulation; Vol.2, Policy Paper 13; ResearchICTAfrica.net accessed via [http://www.researchictafrica.net/publications/Policy\_Paper\_Series\_Towards\_Evidence-based\_ICT\_Policy\_and\_Regulation\_-\_Volume\_2/Vol%202%20Paper%2013%20-%20Uganda%20ICT%20Sector%20Performance%20Review%](http://www.researchictafrica.net/publications/Policy_Paper_Series_Towards_Evidence-based_ICT_Policy_and_Regulation_-_Volume_2/Vol%202%20Paper%2013%20-%20Uganda%20ICT%20Sector%20Performance%20Review%25) on 8th February 2012

1. Micheal Niyitegeka (mniyitegeka@cit.mak.ac.ug) is the Head; Corporate Relations Office, Makerere University College of Computing and Information Sciences [↑](#footnote-ref-1)
2. Roch Glitho PhD; (glitho@ece.concordia.ca) is an Assoc Prof. of Networking and Telecommunications at Concordia University and is the Canada Research Chair for Ender User Service Engineering in Communications Networks. [↑](#footnote-ref-2)
3. HEI for the purpose of this case-study shall refer to [vocational schools](http://en.wikipedia.org/wiki/Vocational_school), trade schools, and career colleges, and Universities that award [academic degrees](http://en.wikipedia.org/wiki/Academic_degree) or [professional certifications](http://en.wikipedia.org/wiki/Professional_certification) [↑](#footnote-ref-3)
4. Faculty shall mean academic members of staff in a HEI [↑](#footnote-ref-4)
5. An inbound engagement is one where the initiative originates from an external stakeholder and is responding to a specific need. [↑](#footnote-ref-5)