

CITANDA 5-YEAR REVIEW



CITANDA

Department of Information Systems



2015-
2020

5-year UCT Research Unit Review

This review reports on the activities of UCT's "Centre for Information Technology and National Development" (**CITANDA**) – a research unit located in the Department of Information Systems – for the period 2015-2020.

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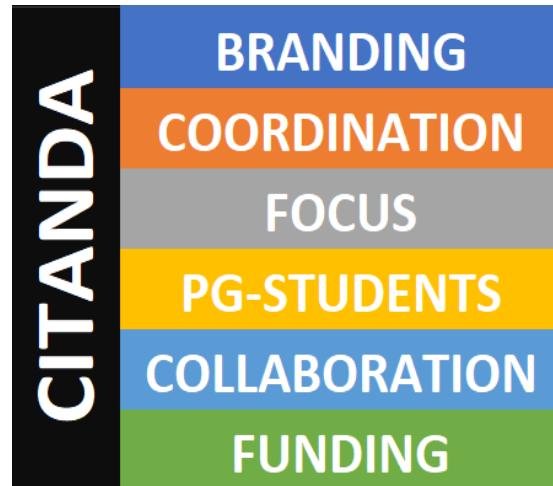
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CITANDA 5-Year Review

5-YEAR UCT RESEARCH UNIT REVIEW

INTRODUCTION

The Centre for Information Technology and National Development (CITANDA) is a research unit in the Department of Information Systems (IS). CITANDA exists to: (i) provide a unique branding to the research of the department, (ii) coordinate the department's research activities, (iii) focus the research done by its members into a few core areas so as to provide more cohesion, (iv) attract quality post-graduate students from Africa in prioritized research areas, (v) stimulate IS staff to collaborate in their research (vi) encourage research publication in high-quality high impact outlets and (vii) provide a platform for fundraising and collaboration.



CITANDA was originally conceived of by Professor Paul Licker in 1998. Prof Roode took over the Directorship of CITANDA in 2003, and was at its helm until 2009, when he sadly passed away. As with Prof Licker, Prof Roode saw the doctoral programme as integral to the goals of CITANDA, and placed it at the centre of his work here. This focus has continued to the present day, with Prof Ojelanki Ngwenyama now running an annual 2-week workshop for doctoral students.

CITANDA is singularly focused on Africa. We strive to be the leading African centre for research into IS in Africa, producing world-class African scholars, and internationally recognised research outputs and postgraduate students.

Since all the IS department staff do research in the CITANDA thematic areas, they are by default affiliated to CITANDA i.e. they are CITANDA members. All PhD students are considered CITANDA research associates too. Because of the objectives and intentional set-up of CITANDA, it is almost impossible to separate the research activities in the IS department from CITANDA. Given this almost complete overlap, the CITANDA Research Unit review incorporates a review of the Information Systems department research outputs.

AIMS AND GOALS OF CITANDA

What is CITANDA?

CITANDA is a research unit within the Department of Information Systems at the University of Cape Town. It is the vehicle through which research in the department is encouraged and supported; this is the 'inward function' of CITANDA. It also serves as a conduit for drawing together research emanating from staff members. This branding of the department's research promotes the outside exposure and acts as a "outward" platform to draw post-graduate students (specifically PhD students) as well as research funding.

CITANDA aims to bring together researchers, projects, funders, and programmes focused on *the use of Information and Communication Technology (ICT) in the service of national development*. In particular, we are interested in (but not limited to) research and international **development** studies in the following areas: The Impact of ICTs on Economic Development; Information Systems and Practices in Development Contexts; ICT for Development Projects and Evaluation of such Projects; ICT for Development Field Studies in Southern Africa; e-/m- Commerce for Development Studies and Evaluation.

Core Research Themes of CITANDA

The four main research themes pursued by CITANDA reflect the diversity in the curriculum of IS, and thus the specialized research interests of different staff members.

ICTs for Development (ICT4D) – our core thematic area

The use of ICTs for social, economic and human development is a central concern for CITANDA. Issues relating to ICTs for disadvantaged, underserved and under-represented rural and urban communities and individuals are investigated in this domain, as are issues pertaining to ICT policy to enhance development in Africa. This includes sub-fields such as M4D (Mobile for Development) and D4D (Data for Development).

ICTs and Innovation

Within this theme is the investigation of ICT innovations and the use of ICTs for innovation. The Internet, e-commerce, e-government, mobile phones, m-commerce, and emerging phenomenon such as IoT, Cloud Computing, block-chain technologies, serverless computing, etc. warrant investigation as to their impact, adoption, adaptation and diffusion amongst individuals, organisations, nations and the global community.

IS Education and Educational Technology

Within this theme is the investigation of both the teaching and learning of IS, and the use of educational and information technologies to assist or drive teaching and learning.

IS Management, KM, IS Project Management, IS Development

This stream encompasses much of the mainstream research in IS, dealing with issues related to IS management, knowledge management, the IS professional, project management, virtual teams, systems development, and IS security. The focus is not only on large commercial organisations, but also on the public sector, health sector, NGOs and SMMEs.

GOVERNANCE STRUCTURE AND MEMBERS

Director

The Director of CITANDA is appointed by the Faculty on recommendation by the Head of Department of Information Systems. CITANDA's first Director after its accreditation by the university was the late Prof Roode. He was succeeded by Prof Irwin Brown in late 2009, followed by Prof Jean-Paul Van Belle who was formally appointed on 6 June 2013. Below is the history of CITANDA directors from its conception, including before formal UCT accreditation in 2007:

Before UCT Accreditation:

1998-2002 Prof Paul Licker
2003-2007 Prof Dewald Roode

After UCT Accreditation:

2008-2009 Prof Dewald Roode (passed away in 2009)
2009-2012 Prof Irwin Brown
2013-present Prof Jean-Paul Van Belle | Deputy-Director: Prof Lisa Seymour

Management Board

CITANDA is managed by a board. Officially the management board consists of the CITANDA Director, the Deputy Director, the Department HOD (prof Irwin Brown), the two Section Heads responsible for Postgraduate studies and Research, one other staff member and a representative from the post-graduate students. However, the Management Board has not met for CITANDA business in a long time. Instead *policy decisions* have typically been taken at departmental research/strategy meetings which have a wider and more inclusive representation. Generally, the decisions are consensus decisions.

Members

All members of the academic staff of the Department of IS are by default members of CITANDA (see Appendix 1). PhD candidates are also by default associates of CITANDA. Staff members do research across the four themes, and in many cases in more than one theme. Additionally, research collaborators from other institutions can be invited to become research associates. This latter option has not been used sufficiently to attract and/or reward outside research collaborators.

Advisory Board

CITANDA does not have its own advisory board. However, the Advisory Board for the Dept of Information Systems also covers research and is thus used for CITANDA. This board encompasses representatives from: **Government** (e.g. Provincial Government, Local Government); **Non-Governmental Organisations** (e.g. Cape IT Initiative); and **Industry** (e.g. Old Mutual, Accenture, Vodacom). However, the Department's board has met very irregularly in the recent past. In the future, the Advisory Board of the Computer Science and the Information Systems department could be merged into one Board for the School of IT, which was formally established in 2019.

DEPARTMENTAL RESEARCH SUPPORTING ACTIVITIES

CITANDA's main inward focus is to serve as a logistical center to support and promote research by staff and post-graduate students. The following research support activities were undertaken during the review period.

Annual Research Writing and Publication Workshop

Together with the R&I office, the department is a class success-story/case study of the annual research writing and publication workshop. Since at least 2007, a 3-day residential workshop has been held, usually in early December, where staff and selected senior PhD "on an academic career track" are given the space to focus on the writing of a research publication. The workshops usually have 15 participants and each participant is expected to produce a published research output at the end of the workshop. The workshops include small group constructive feedback sessions. Given the pressures and workloads of staff and students during the academic year, these workshops provide a much-needed intellectual, social and practical environment to focus solely on research writing, with a peer-support structure as well as strong developmental focus. This is, without doubt, one of the most productive, successful and impact-full research initiatives in the department. It is organized by the Director of CITANDA. When the research office did not have any budget to support the workshop (e.g. 2014), CITANDA wholly provided the necessary finance. In many years, a professionally proof-reading service is engaged and paid for by CITANDA. Last year, CITANDA shared half of the significant shortfall (difference) between the cost of the venue preferred by the staff and the lower budget provided by R&I.

Support for International Visitors

CITANDA formally invites and provides financial and logistical support for international visiting academics identified to provide a strong developmental contribution to the staff and post-graduate students. Typically part of the flight and full accommodation is provided. Visitors for the period under review for which CITANDA provided financial support including Prof Nik Hassan, Prof Richard Baskerville, Prof Robert Davison, Prof Frantz Rowe, Prof Kalle Lyytinen, Dr Virendra Kumar, Prof Brian Pentland.

Organisational Support for Academic Conference

Although the actual academic and logistical organization of academic conferences hosted by the department is done by staff members, CITANDA serves as a practical support structure facilitating bookings, pre-payments, procurement, registration fee payments and the like. Logistical and practical support was given to the following conferences: African Conference on Information Systems and Technology (ACIST 2017, ACIST 2018), International Conference for Information Resource Management (Conf-IRM 2016), Second International Conference on Information Security and Cyber Forensics (InfoSec 2015).

In addition, CITANDA formally instigated the (unsuccessful) bid for the IFIP WG9.4 (Social Implications of Computers in Developing Countries (2021) and also provided bid support for the (successful) WikiMania 2019. In addition, CITANDA has been an academic partner supporting the Annual International Conference on Cloud Computing, Data Science & Engineering (Confluence) organized by Amity University (Noida, India) with whom UCT has signed an MoU.

Industry Workshop Support

Similar to the academic conference support, CITANDA also facilitates the practical organization of small industry training workshops such as IBM Application Security, IBM Security Intelligence; IBM Cognos; AWS Cloud Computing. These workshops can only be offered by accredited trainers who have qualified (i.e. selected staff and post-graduate students).

Financial Support for PG Student Conference Attendance

Postgraduate students stand to gain much from conference attendance and paper presentations. In the past, it was often the case that the supervisor would present papers co-authored by their supervised students at conferences. However, post-graduate students learn immensely from conferences: they learn about the academic community, network with other students, see leading scholars in action, are motivated by the prospect of local or international travel, get concrete reviewer and audience feedback on their ongoing, and some get inspired to continue with an academic career.

Therefore, a principled decision was made to promote the participation of post-graduate students at academic research conferences. One of the main constraints that was identified was the financial cost of local and international conferences. Both UCT and the NRF have fairly generous financial support schemes for post-graduate students at Masters and PhD level; but the paperwork, deadlines and uncertainty of funding are often experienced as obstacles, especially given that the student paper acceptance at conferences meeting DHET criteria are estimated to be in the order of one-in-three. Thus a 'default' policy has been adopted whereby the supervisor, Information Systems department and CITANDA each contribute equally to conference travel, registration and accommodation costs up to a maximum amount. The total support amount has gradually been adjusted from R4500 (start of review period), to R6000 (2017-2018), to R7500 (2019-current). However, this funding is contingent on the conference meeting DHET-funding requirements (i.e. peer-reviewed, ISBN proceedings etc.), the student presenting the paper and other sources of finance having been exhausted.

This initiative has proven to be a success with more and more students presenting and attending conferences over the past five years. CITANDA manages the applications, financial contributions and disbursements of this initiative.

Staff Publication Incentive and Assistance

CITANDA supports staff publications costs where necessary. Specifically, in order to incentivize the publication in IS top journals, staff who *submit* a paper to one of the top-8 journals in the discipline receive an up-front grant of R2,500, and an additional R12,500 is paid on acceptance of the paper. At one occasion, urgent journal page publication charges for staff were paid.

Postdoc Employment and Management

CITANDA has employed two full-time post-docs under the period under review. Dr S Mudanvanhu was appointed 2015-2017 using funds provided by research office as a result from the previous successful institutional review. Dr Paul Mungai has been appointed for the Fairwork research project since 2018. Details on their research are provided below. In addition, CITANDA also manages the funds for some of three other recently appointed postdocs in the department.

Other Assistance

Where staff require research assistance this will be provided. E.g. in a number of instances, staff required research cash flow assistance i.e. allocated or approved funds were obtained but not yet received, but research costs had to be paid. In such cases, CITANDA provided bridging funds.

RESEARCH OUTPUTS

The key metric for a research unit is its research outputs. IS researchers can choose whether to use CITANDA or the Department of Information Systems as their affiliation; in most cases they opt for the Departmental affiliation. This section therefore looks at the total research outputs in the department. The two core metrics investigated are the DHET accredited research publications – which have doubled from the period prior to review - and the postgraduate students – which have *more than doubled*.

DHET-accredited Research Publications

Total research publication outputs have **increased dramatically** in the period under review, despite the IS department not having increased its staff complement. The period 2014-19 has shown a level of research outputs at a level that significantly exceeds that of earlier years. In fact, the average number of research publications over 2014-19 (73 publications) is **exactly double** the average of 2003-2012 (36.5 pubs)¹.

An important fact to note is that, unlike for many other disciplines, peer reviewed conference proceedings are recognized as a critical, high-quality and primary research output in the disciplines of Computer Science and Information Systems; indeed this is explicitly recognized as such by the National Research Foundation (NRF) in its researcher rating schedule for researchers in our discipline. Some top-quality IS conferences have a lower acceptance rate than many journals; and conference papers are seen as a key publication strategy in a discipline that is very young, dynamic and still evolving very fast. Thus, staff and students will continue to present papers at conferences seen to be highly relevant (e.g. African or ICT4D conferences) or of high standing (AIS-affiliated) *even if no DoE-accreditation is earned*. It is important to support this conference attendance, both for their networking potential and our visibility in the relevant research communities.

¹ The figures for 2019 are provisional pending review/confirmation by the DHET. The count for 2013 is halfway between the two averages and can be seen as the 'transition year', so it was omitted from the average calculation. Note that 2016 appears to be an outlier which has lowered the average to some extent.

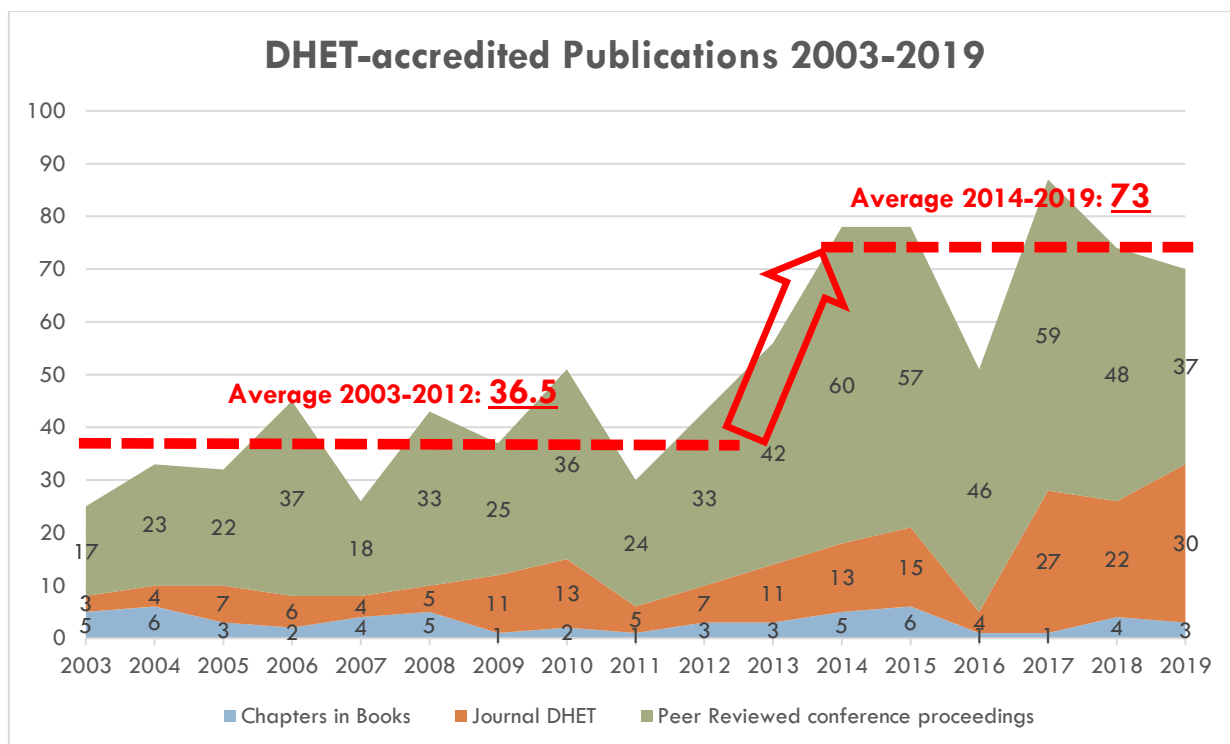


FIGURE 1: DHET-ACCREDITED RESEARCH PUBLICATIONS 2003-2019 ILLUSTRATING A GENERAL DOUBLING IN OUTPUTS

It is understood that DHET-accredited conferences carry less weight in terms of subsidy – 50% of accredited journal articles, although some conference proceedings appearing in serialized monographs such as Springer’s Lecture Notes series and attract(ed) a full subsidy. Conference papers often also have a lesser impact factor; thus one of the key outcomes and proposed strategies after the first CITANDA review cycle was to promote the publication of journal articles, specifically in top IS journals (this has *not* yet been achieved) and ‘targeted journals’ i.e. those journals where we would like to be seen e.g. ICT4D journals and journals focusing on development or Africa (this *has* been achieved to a large extent). Figure 2 below illustrates the dramatically growing **share** in journal publications at the expense of conference papers during the period under review. In fact, one can discern three phases in the *quality* of research outputs: in the period 2003-2008, journal articles averaged about 5 annually, this doubled in the period 2009-2013 to about 10 per annum, and then this has *more than doubled* again subsequently to the high twenties in 2017-2019.

The department, its research vehicle CITANDA, and the interventions can thus be seen as a success story of converting what was initially primarily a teaching department (late 90s, early 00’s) into a research department as per UCT’s strategic goals. Part of this strategy involved growing the post-graduate student complement of the department; this helped directly and indirectly increase the research publications. It must be emphasized that there was a very strong push by CITANDA and the department to instill a strong research culture amongst its staff. Additionally, new staff hires were assessed more strictly on their ability to do research – with several of our new staff having achieved post-graduate studies in the department.

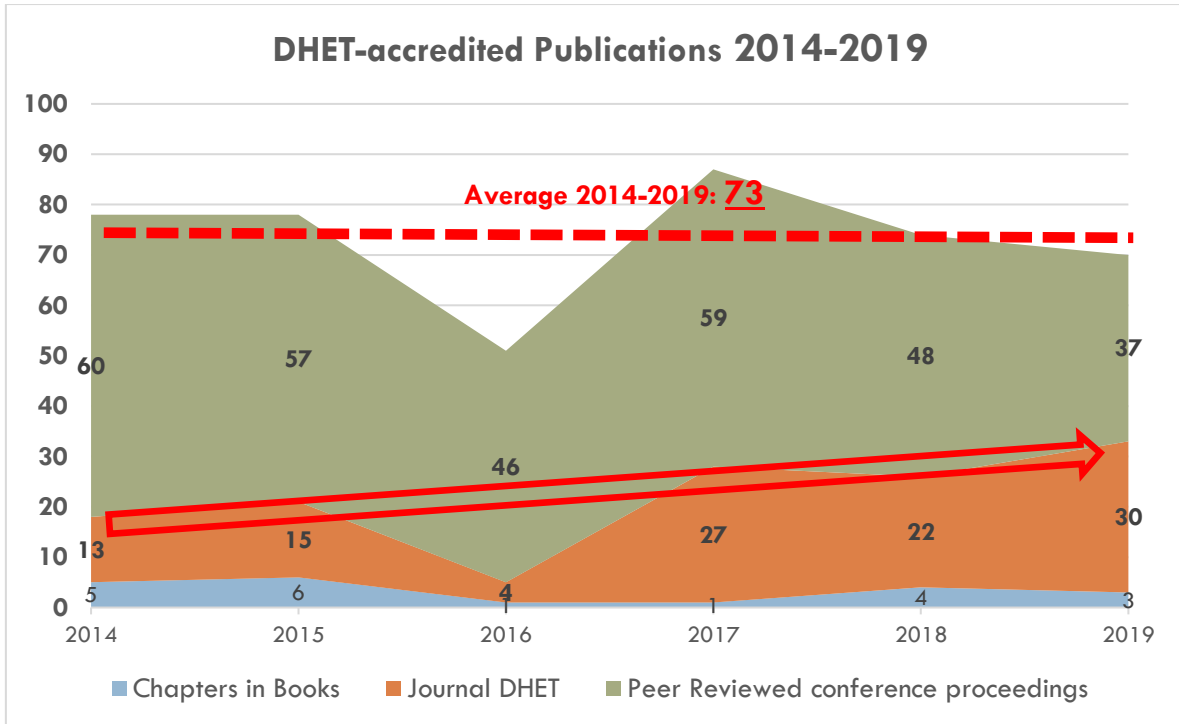


FIGURE 2: DHET-ACCREDITED RESEARCH PUBLICATIONS 2013-2019 ILLUSTRATING A MORE THAN DOUBLING SHARE OF JOURNALS

Post-Graduate Students

What is particularly encouraging for the department – but also the result of a deliberate strategy – is the strong increase in PhD and Masters (full or mini-dissertation) student graduations². One of CITANDA’s core goals is to attract quality post-graduate students and it appears to have succeeded in this goal particularly well. Prior to CITANDA’s formal establishment as a research unit, Masters graduations were less than 5 per annum and we had only 1 or 2 PhD graduations per annum. In the first five years of CITANDA’s formal accreditation, we reached a steady state output of around 10 Masters student and three to five PhD student graduations per annum. In the last few years, the number of Masters and PhD student graduations has *again doubled and averaged 20 Masters students/annum since 2014 and between 6 to 13 PhD graduations since 2016* (Figure 3).

It must be noted that Masters student graduations lag intake by two (minimum) to three (average) years and PhD student graduates by three (minimum) to five (average) years. Post-graduate student through-put remains a concern in the department: there are roughly 80 M and PhD students registered and some drop out due to financial, academic or personal reasons.

² Unlike some other universities, the IS department does not have ‘professional masters’ or a fully taught (course-work) Masters degree e.g. the “MIT”.

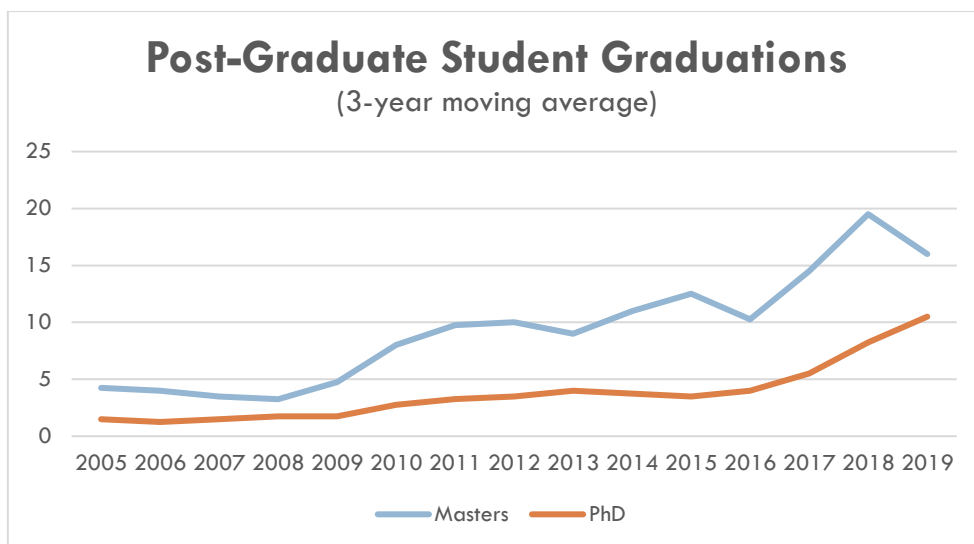


FIGURE 3: POST-GRADUATE STUDENT GRADUATIONS (2-YEAR MOVING AVERAGE³)

Figure 4 below shows the diversity of our PhD graduates, clearly showcasing the African international drawing power and impact we are making.

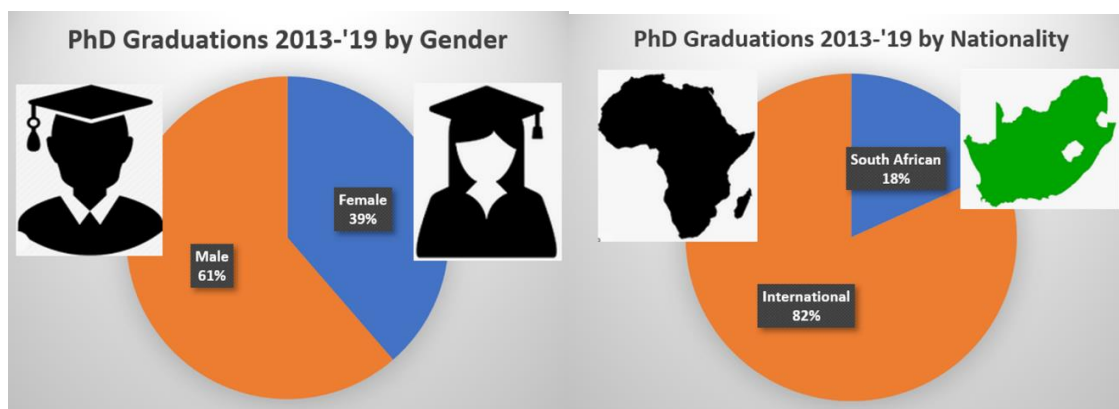


FIGURE 4: PHD GRADUATE PROFILE (2013-2019)

Although supervision of post-graduate students adds to the workload of IS staff members, it can contribute positively to the research publication outputs. Firstly, the research conducted by the student can be published with the supervisor – assuming that the supervisor has the time to ‘convert’ the research thesis into publications, in cases where students are no longer research-active after graduation. Secondly, more recently we have been encouraging students to write and publish their own papers as part of their ongoing research journey. This enables them to get early feedback from the academic community on their thesis research project. It is exactly these pathways which were targeted by the CITANDA interventions in terms of inviting PhD students to the academic writing workshops (their attendance is *not* paid for by the R&I office, so they are wholly supported by the department and CITANDA) as well as the guaranteed financial assistance for conference paper presentation (and attendance).

³ A 3-year moving average is given for smoothing purposes because graduations are very ‘spiky’, depending on a variety of factors outside the control of the department e.g. 2013 saw 6 Master students graduate, 2014 had 22 graduation, 2015 had nil and 2016 had 19.

CITANDA-HOSTED RESEARCH PROJECTS

ESEFA (PI/Executive Sponsor: Prof Lisa Seymour; Manager: Gwamaka Mwalemba)



The Enterprise Systems Education For Africa (ESEFA) initiative aims to address the shortage of Enterprise Systems skills on the Africa continent by encouraging African universities to train suitably qualified Enterprise Systems (ES) and Enterprise Resource Planning (ERP) professionals. In addition to addressing the industry need for ERP skills, additional project outcomes are to create employment opportunities for graduates and contribute to an increase in Africa's competitiveness, productivity and growth.

The funded project phase ran from Sep 2013 till July 2016 and was a collaboration between UCT, the Otto-von-Guericke University Magdeburg (OVGU) and ERP market leader SAP's University Alliances programme. The project team developed a context-appropriate curriculum and established an African university community across 9 sub-saharan countries to deliver ERP education courses, eventually training over 4000 students across the continent. A budget of €2 million was secured through a public-private partnership.

From August 2016 the ESEFA project successfully transitioned to a financially self-sustainable education programme whereby the course and support fees provided sufficient income to pay for the lecturers and programme manager. Although the programme is run independently, the UCT overheads and project surplus was allocated to CITANDA who formally underwrote the programme's financial and operational sustainability.

More information: <http://www.esefa.ac.za/esefa/about/the-programme>



Fair Work in the South Africa Gig Economy (UCT PI: Prof J.P. Van Belle; PostDoc: Dr P. Mungai)



The Fairwork project (<http://fair.work>) aims to highlight unfair labour practices in the gig economy, and to assist workers, consumers and regulators as they hold platforms to account. Platforms have the potential to address South Africa's huge unemployment problem. But, at the same time, some are disrupting existing social and labour structures, and potentially eroding existing jobs. Empirical evidence also increasingly reveals that platform workers experience precarious and unfair conditions; for

instance the pay levels have sometimes become a race to the bottom. Work in the gig economy is often unsafe and insecure. Workers lack protections afforded to regular employees, like sick pay and unemployment benefits.

The Fairwork Project focuses on five core principles of fair platform work: Fair Pay, Fair Conditions, Fair Contracts, Fair Management and Fair Representation. The first two principles concern whether workers receive a fair pay for their work and if their jobs are characterised by healthy and safe working conditions. The three others focus on whether the platform's contract with the workers is fair; whether management processes and communication channels are clear and transparent; and whether platforms allow for the expression of worker voice through open worker representation. We assessed evidence against each of these principles through a combination of worker interviews and platform-provided evidence.

The Centre for IT and National Development (CITANDA) is spearheading the Fairwork project in South Africa, along with partners from the University of Oxford and the University of Manchester, who are also implementing this ratings scheme in India, Germany, and the UK. We also work with a legal team from the University of the Western Cape (UWC) and Oxford who look at potential government-level policy actions and regulatory interventions to better protect gig workers. Furthermore, we are aiming to sensitize and influence customers/ clients of these platforms to take note of our ratings. We are also in constant discussions with platforms themselves, and some have demonstrated a concern for fair working conditions by taking action to improve their score.

The first phase of the project (Oct 2018 – Feb 2021) is funded by the UK's GCRF with CITANDA's share of the budget just over GBP127,000 / ZAR2,700,000. Funding from the GIZ has already been secured to extend the Fairwork project by another 16 months (till Jun 2022). Numerous academic publications, public reports and news articles have resulted so far from this research.

While South Africa's move towards the Fourth Industrial Revolution is inevitable and largely welcome, it is crucial that we safeguard important protections for workers. The range in Fairwork scores across South African platforms is proof that very different models of work are possible within the gig economy. Crucially, this points to pathways for effective regulation, and provides a basis from which collective bodies of workers can formulate their demands. Our hope is that workers, consumers, regulators and companies use the Fairwork framework and ratings to imagine, and realise, a fairer South African gig economy.



Exploring Cybersecurity Capacity in Sub-Saharan African Countries (UCT PIs: Prof Irwin Brown; Prof Wallace Chigona)

There is an increase in annual technological risks, such as data fraud, cyber terrorism, cyber-attacks, and Critical Information Infrastructure (CII) breakdown. This is particularly true for Africa; several reports foresee a grim picture regarding the unprecedented increase of cybercrime in the region. The world over, cybersecurity has become a central issue, and it has become important to strategically align cybersecurity strategies in order to maintain global consistency in Internet safety. However, there is dearth of research on how attempts made by developing countries to adopt cybersecurity protocols from developed nations have been successful. Cybersecurity Capacity Centre for Southern Africa (C3SA) seeks to engage with this challenge.

C3SA provides a single-entry point for cybersecurity capacity building and research activities in the Southern Africa region and beyond. C3SA is a consortium between Research ICT Africa (RIA), the Department of Information Systems (DIS) at the University of Cape Town (UCT), the Global Cyber Security Capacity Centre (GCSCC) at the University of Oxford, and the Norwegian Institute of International Affairs (NUPI). C3SA is part of the global constellation of regional cybersecurity capacity research centres led by the Global Cyber Security Capacity Centre at Oxford University. Other partners in the constellation include the Oceania Cyber Security Centre. C3SA acts as a coordination and collaboration hub between cybersecurity capacity-building actors in order to reduce duplication of efforts on cyber capacity building in the region. The C3SA, furthermore, aims at empowering the poor and traditionally marginalised groups, including women and minorities.

This research project aims at providing policy recommendations to help African stakeholders develop comprehensive policies and strategies on cybersecurity, so as to ensure a cybersecurity landscape that is adaptable and resilient to cybersecurity risks and threat. The research evaluates the cybersecurity maturity of a country across five dimensions: 1) cybersecurity policy and strategy; 2) cyber society and culture; 3) cybersecurity education, training and skills; 4) legal and regulatory frameworks; 5) standards, organisations and technologies.

The project is funded by a grant from the Ministry of Foreign Affairs of the Government of Norway. The grant covers 2 PhD fellowships, 2 Post-Doctoral fellowships and personnel costs for the supporting team of the project. It covers equipment and travel costs to visit 6 countries across Africa in two years.



Cybersecurity Capacity Centre for Southern Africa

FOWIGS Fair Work in the Platform Economy: A Global South Perspective (UCT PIs: Prof J.P. Van Belle; Pitso Tsibolane)



The FOWIGS (Future of Work in the Global South) “Fair Work in the Platform Economy: A Global South Perspective” is an action research project funded by the IDRC via the Centro Latam Digital as part of the “Future of Work in the Global South” initiative. The project is co-ordinated by Jean-Paul Van Belle and Pitso Tsibolane at the Centre for IT and National Development in Africa which is the lead

partner. Collaboration partners are Mark Graham at the Oxford Internet Institute and Richard Heeks at the Centre for Development Informatics, University of Manchester. This project builds on the Fairwork in the South African Gig Economy and the Fairwork Foundation’s (<http://fair.work>) principles for decent platform work – which incorporate ILO decent work standards – by assessing to what extent these principles are adhered to by local digital platforms in three global South economies. It extends the current exploratory project where worker experiences are solicited and a platform rating scheme has been designed in South Africa. This project aims to expand the reach and validate the findings in other global South economies, while building capacity and a network around the Fair Work initiative.

The project kicked off in August 2019 by issuing a call to interested researchers and selecting a local collaboration team in (initially two, but later expanded to) three global South countries. 31 applications were received from Argentina, Bangladesh, Brazil, Chile, Colombia, Costa Rica, Ecuador, Ghana, India, Indonesia, Kenya, Mexico, Nigeria, Paraguay, Peru, Philippines, Sri Lanka, Tanzania, Uruguay and Zimbabwe. The bids from teams in Indonesia, Ecuador and Chile were selected. An Argentinian team has since asked to join the project using its own funds. The local teams will be mentored and supported by the core research team throughout the project. Empirical data will be gathered from workers and service providers on a selection of local platforms using semi-structured interviews during 2020. Draft platform ratings in terms of the proposed Fair Work rating framework will be developed. Meetings with the local platform owners will be set up to discuss the ratings and plans for improving the work platform standards. The findings and further action plans will be published in research papers and strategy documents at the country level and an integrated assessment end of 2020; and a final workshop in Cape Town in Feb. 2021.

The total funding provided is CAD75,000. Of the budget, 16% is allocated to the investigators research time buy-out; 10% to core team travel; 11% to UCT overheads; 30% to the three local teams (10% each); and the remainder to allow the local teams to travel to the UK progress/feedback (now virtual) and Cape Town results workshops.



HEDIS Hub for Education on ICT for Sustainability (UCT PI: Prof Wallace Chigona; Researchers: Dr. M.-R. Lorini, T. Chimboza)

HEDIS aims to develop evidence-based curriculum on how ICTs may be used to support sustainability in Africa. HEDIS is a collaborative project of Nelson Mandela University (NMU), the University of Cape Town (UCT) and Carl von Ossietzky University (UOL) in Oldenburg, Germany. At NMU, the Hub is housed in the Dept of Computing Sciences; at UCT it is housed in the Dept of Information Systems. The project is primarily funded by the German Academic Exchange Service (DAAD).

HEDIS aims to explore topics related to sustainability in the global south from an academic as well as practical perspective. The topics of interest include Water Management, Energy Efficiency, Waste Management, Sustainable Mobility, Education on Sustainability, Sustainability Entrepreneurship, Internet of Things, Smart Cities, and Digital Transformation. The project seeks to develop modules on these topics. The modules will be integrated into various academic programmes at NMU and UCT.

Since its inception in 2017, HEDIS has run a number of activities including workshops and summer schools. The students to the summer schools are drawn from the partner universities. The summer school has alternated between NMU and UCT. In 2019 the project ran a “Summer School on the Road” which involved the participants visiting industrial projects where ICTs are used to support their sustainability efforts. The focus of the 2020 summer school will be to bring together the lessons learnt from the previous summer schools to develop curricula as well as to develop papers which will be published in an edited book.

An important aspect of HEDIS has been the involvement of industrial partners. The industrial partners include both international companies such as Volkswagen as well as local organisations such as Sustainability Institute (Cape Town). The inclusion of industry partners has served two critical purposes: (i) it has helped the summer school to be informed by real industry-based case studies and (ii) it has facilitated that some industries have benefited directly from the input of the academic members of HEDIS as well as the summer school students.

HEDIS will attempt to continue developing and strengthening the network it has established with the industrial partners beyond the life of the project. These stakeholders will provide ongoing case studies, data and expertise to assist researchers with practical applications of research projects.



ICT4D and Digital Labour Research (PostDoc: Dr Selina Mudavanhu)



After completing a first successful 5-year review in 2013, CITANDA was awarded a PostDoc scholarship for 2 years. This position was filled by Dr Selina Mudavanhu, working under the guidance of the CITANDA director. The research brief was first to scan the ICT4D research for gaps and future research directions, from which emanated the vision to focus on Digital Labour. This led, arguably, to CITANDA being approached by the Fairwork research team to participate in its (eventually successful) GCRF proposal bid. The following publications were produced by this

research project.

- Van Belle J.P. & Mudavanhu S. (2018). [Digital Labour in Africa: A Status Report](#). Development Implications of Digital Economies Paper No. 5.
- Van Belle J.P., Tsibolane, P. & Mudavanhu S. (2018). Digital Labour in Africa: A Status Report. African Conference on Information Systems and Technologies, July, 9-10 July, Cape Town.
- Van Belle J.P. & Mudavanhu S.L. (2016). A Review of Research on Mobile Phones and Development Published in Three Top ICTD Journals (ITID, EJISSDC and ITD) 2011-2015.
- Ghosh I., Haseki M., Mudavanhu S. & Van Belle J.P. (2015). A Critical Evaluation of Past IDIA Research: Lessons Learnt for IDIA and ICT4D Researchers. In Steyn, J., Van Belle, J.P. (eds.) (2015). Beyond development. Time for a new ICT4D paradigm? pp 1-17.

Other (Completed) Projects

Examples of other collaborative research projects with a strong social responsiveness angle during the period under review included:

The Vrygrond Community Laboratory (PI: Prof Wallace Chigona)



Another CITANDA initiative was the involvement with the Vrygrond community, one of the oldest informal settlements in the Western Cape. In collaboration with Vrygrond Community Development Trust, the Vrygrond Business Forum, Vrygrond NGO Forum and Pforzheim University, members were involved in a project to enhance youth and adult skills development and access to knowledge through computer skills training and self-supported development while at the same time promoting

research. A computer lab has already been implemented (The Vrygrond Community Lab – VCL). This project was handed over fully to the community in 2019. More information: <http://thecompasstrust.com/cause/vrygrond-computer-lab/>

The Cyberbullying Project (PI: Prof Michael Kyobe)

This project involved collaboration with seven schools in Cape Town, and aims to develop a model that can be used to minimise mobile & cyber-bullying among young people, create broader awareness of the problem and shaping policy on use of mobile technology in a learning environment. It is funded by funded by the NRF, and also supported by the World Anti-bullying Forum and the International Bullying Prevention Association.

STAFF DEVELOPMENT AND CONTINUITY

The Department of Information Systems which CITANDA serves has seen a quite dramatic change in its staff composition, with a number of senior staff retiring: Prof M. Hart, Prof D. Smith, A/Prof K. Johnston, A/Prof E. Scott, Prof O. Ngwenyama. However, this has created the space for new, upcoming researchers to define their own career paths and research priorities. Thus we now have a cohort of young, dynamic researchers and some of the previously more junior staff have, by virtue of their demonstrated research capability, risen up to become the new 'senior researchers' and research leaders in the department.

It is a pre-requisite of all new staff to have PhDs or to be in the process of studying for it. Although the IS staff has always had a very diverse and transformative profile, we had relatively few black South African staff members. This has been remedied to some extent in the recent past with the appointments of Mr Pitso Tsibolane (2018), Dr. Adheesh Budree (2018) and Ms Ayande Pekana (2019).

The developmental activities of CITANDA are focused specifically at engaging and developing our emerging researchers and our PhD students.

Appendix 1 lists the IS department's current academic staff profile and research interests.

CITANDA FINANCIALS AND RESEARCH FUNDING

This section details the current and budgeted financial position of CITANDA.

Recurrent Income and Expenditures - CITANDA fund (2015 – 2020)

This section discusses the income and expenditure related to the day-to-day activities of CITANDA, typically within the department. The larger successful research project listed above normally open their own project fund. Therefore, detailed research project-related income and expenditure is not normally reflected in the CITANDA account; with only net research project income/accruals shown. Table 1 below shows the major categories of Income to the CITANDA fund, and the major categories of expense. Income is typically linked to specific activities or related to the hosting of specific conferences. Apart from the research project income (discussed below), the largest two cost and income items are

- Conferences: the department, facilitated by CITANDA, has organized a number of local and international conferences in the review period: the African Conference on Information Systems and Technology (ACIST 2017, ACIST 2018), International Conference for Information Resource Management (Conf-IRM 2016), Second International Conference on Information Security and Cyber Forensics (InfoSec 2015). The aim for any conference organized is to break even, typically with a budget showing a small surplus 'as a safety barrier'. For the conferences under the review period, a surplus was indeed achieved. Similarly, workshops are also run with the intention of breaking even after presenter fees and venue expenses are factored in.
- PostDocs: the postdoc budget is **perfectly balanced** because any postdocs employed have to be funded from specific sources. The postdocs reflected in the budget shown have been funded by the department in lieu of other staff savings and research staff buy-out time (i.e. the FairWork project). It must be noted that the budget for the two CITANDA-specific postdocs is *not* reflected in the budget because Dr Selina Mudanvanhu was funded and paid by the R&I Office in respect of a successfully completed first review and Dr Paul Mungai is being funded and paid directly out of the Fairwork research project fund. Including their postdoc stipends would increase the budget by almost R1 million.

CITANDA has been breaking even on the recurrent expenditure. Initially this was done on a conservative principle that CITANDA had no strong financial reserves or long-term sustainability model. This issue was flagged at the previous review as a weakness; and this was noted as an urgent strategic issue to address. Following this, it was proposed and agreed that individual academic IS staff would contribute *voluntarily* a percentage (set at 5%) of their annual URC Block Grant to CITANDA as a recurrent funding mechanism. This proved to be successful with *all senior researchers/academics* in the department voluntarily ceding 5% of their URC Block Grant in 2015 and 2016. Following the R2+ million ESEFA contribution in 2016, this contribution was no longer needed or solicited. Additionally, it was agreed that staff applying for research project grants should build in research overhead charges to be earmarked for CITANDA. This was subsequently done for the Fairwork and FOWIGS projects. A final note concerns two small individual donations by

external (international) PhD examiners who preferred their examination fee to support UCT students directly.

Given the financial reserves (generating some interest income) and the overhead charges + surplus funds from research projects, no other sources of income are necessary and CITANDA will remain financially self-supporting for the foreseeable future given current expenditure patterns. In fact, CITANDA now has the opposite challenge which is to decide on other possible ways in which to spend part of its reserves productively in order to further its role in the department (i.e. promoting research) and outside.

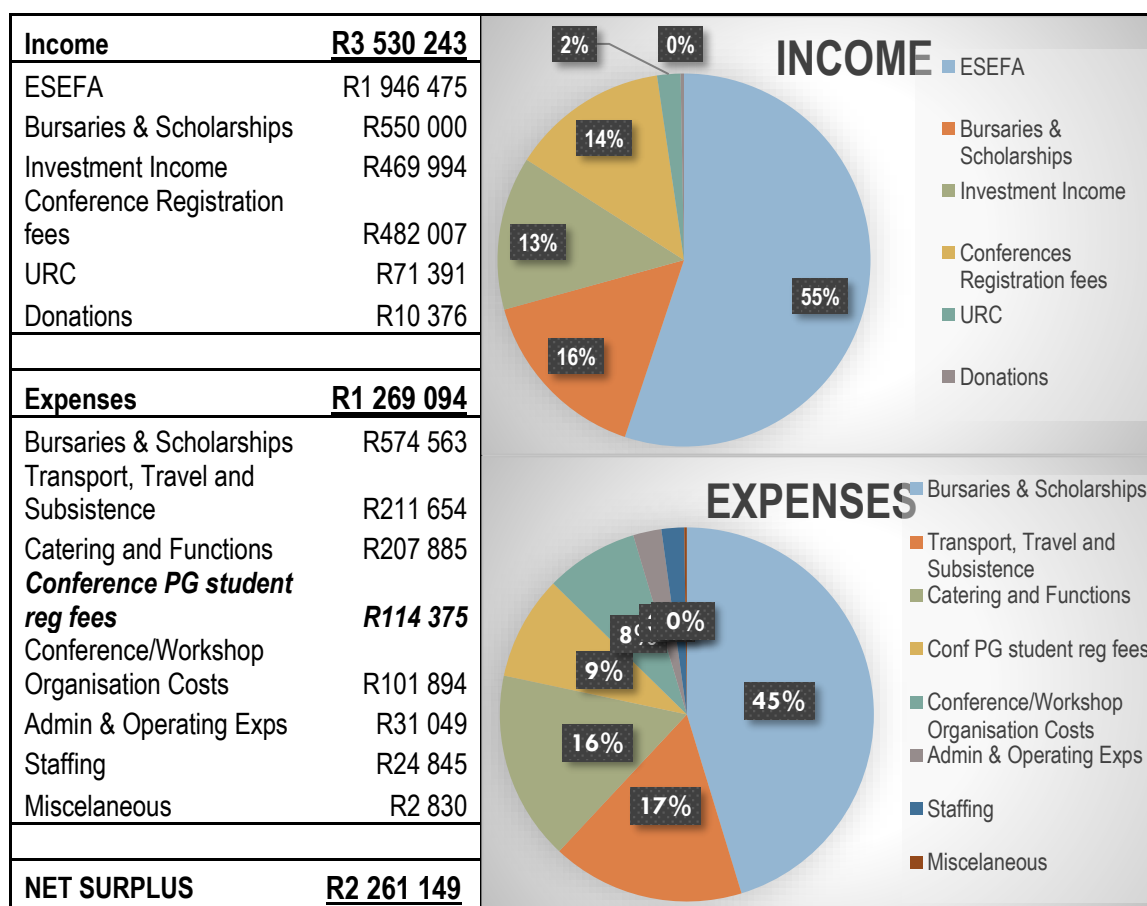


FIGURE 5: CITANDA RECURRENT INCOME AND EXPENDITURE

Ad-hoc Income from Research Projects: Surplus and Overhead Charges

Any research projects undertaken (partly or wholly) under the CITANDA banner should, where possible budget for overhead charges, ideally as per the prescribed UCT Research Costing Schedule. Waivers are allowed for small projects, projects where the funder does not allow for overhead expenses and projects where the inclusion of overheads would seriously threaten the chances of acceptance. By and large, the ESEFA project ensured CITANDA’s financial security. In addition, the two other current research projects have also incorporated a generous overhead charge. As historically agreed with the Dean, overhead charges for research projects after 2018 are split 80%/20% between the research institute/unit and the Faculty.

ESEFA: Net surplus R1,946,475 (2016)

In 2016, the first, fully externally funded phase of the ESEFA project came to an end and the second phase, which required financial self-sustainability, started. Although the initial ESEFA project was not directly run under the CITANDA banner, CITANDA provided a formal home and took on some of the institutional guarantees for the second phase. To this end, the executive sponsor (Prof Lisa Seymour), channelled the budget for the overhead charges as well as any budget surplus (partly as a consequence of fortuitous foreign exchange movements) to CITANDA. This totalled R 2,202,611 and was invested in CITANDA’s investment fund. The second phase of the ESEFA project proved to be financially sustainable and no call on these funds was made. This contribution alone assured CITANDA’s long term financial sustainability given the current expenditure patters.

Fairwork: Net surplus ±R348,000 (2020-2021) + ±R200,000 (2021-2022)

The Fairwork project has already secured a grant of in excess of GBP127,000 / ZAR2,700,000 from the GCRF with GBP 16195 / ZAR 348,000 earmarked for overheads (20% on salary costs); 80% of this to accrue to CITANDA during 2020 and early 2021. Funding from the GIZ has already been secured to extend the Fairwork project by another 16 months, which will result in at least another ZAR 200,00 contribution. Favourable foreign exchange movements may add further contributions.

University of Cape Town		Budget submitted	Budget awarded
Salary costs (JP Van Belle)	0.20 FTE, Months 1-30, Work Packages 2, 3, 4 and 5	GBP 40,375.00	GBP 40,966.26
Salary costs (Postdoc)	1.0 FTE, Months 1-30, Work Packages 2, 3, 4 and 5	GBP 39,430.00	GBP 40,007.43
Fieldwork	Fieldwork WP2 Local Transport 30 days postdoc & 10 day JP Belle @ £20 per day	GBP 800.00	GBP 811.72
Fieldwork	Fieldwork WP4 Local Transport 40 days postdoc & 10 day JP Belle @ £20 per days	GBP 1,000.00	GBP 1,014.64
Fieldwork	Fieldwork WP4 Travel, Accom, Subsistence, Local travel (Johannesburg 2 month fieldwork)	GBP 7,500.00	GBP 7,559.11
Consumables	interview costs WP2 & WP4 (300 interviews at average £15 each)	GBP 4,500.00	GBP 4,565.90
Travel & Subsistence	Conferences: JP Van Belle (1x South Africa based conference) - Flight, Accom, Subsistence, Registration fee	GBP 1,105.00	GBP 1,121.18
Travel & Subsistence	Conferences: JP Van Belle (3x international based conference) - Flight, Accom, Subsistence, Registration fee	GBP 5,865.00	GBP 5,950.89
Travel & Subsistence	Conferences: Postdoc (1x South Africa based conference) - Flight, Accom, Subsistence, Registration fee	GBP 1,105.00	GBP 1,121.18
Travel & Subsistence	Conferences: PostDoc (3x international based conference) - Flight, Accom, Subsistence, Registration fee	GBP 5,685.00	GBP 5,950.89
Other	1 x Laptop for PostDoc	GBP 1,750.00	GBP 1,775.63
Overheads (on staff only)	20% of total salary costs	GBP 15,961.00	GBP 16,194.74
TOTAL		GBP 125,076.00	GBP 127,039.56

FIGURE 6: FAIRWORK RESEARCH PROJECT – CITANDA BUDGET SHARE

FOWIGS: R80,000 (2020) + ±R20,000 (2021)

The total award for the FOWIGS project was CAD 74 988 of which 80% has already been transferred to UCT (ZAR 917,500). Eleven percent of the budget was earmarked for UCT (25% on direct personnel – R20,000) and CITANDA (9.75% on direct expenditure – R80,000) overheads. A further 20% of the award is payable in 2021, with similar overhead contribution

Financial Sustainability Projections

The following table demonstrates the ongoing financial viability and sustainability of CITANDA. The assumptions underlying the 3-year projection are:

REVENUE:

- PostDocs and Student Conf Attendance will continue to be supported partially by a departmental commitment;
- the interest earned on CITANDA's investment fund will be approximately 75% of the interest rate since 2016;
- the Fairwork Project GCRF funding guaranteed till 2021 with request to submit new budget for 18-month extension;
- FOWIGS budget as per budget (80% of the funds already received)

EXPENDITURE:

- Steady state model continuing current expenditure patterns.
- Assuming no conference organization (these are normally surplus generating or break even).

	Actuals Σ2015-2020	3 Year Forecast in Constant Rands			
		2020	2021	2022	Σ2020-2022
		Total	Total	Total	Total
Opening Balance, i.e. at beginning of each period	295368.6	2556517	2575517	2674205	2556517
A) Income:	3530243	535000	614688	535000	1684688
A1) UCT:	1091385	375000	375000	375000	1125000
URC	71391				0
Bursaries & Scholarships	550000	350000	350000	350000	1050000
Investment Income	469994	25000	25000	25000	75000
		0	0	0	0
A2) External: Local	482007	0	0	0	0
Conferences - Registration fees (some Intl)	482007	0	0	0	0
	0	0	0	0	0
A3) External: Foreign	1956851	160000	239688	160000	559694
Donations (ceded examination fees)	10376	0	0	0	0
ESEFA Overhead charge & surplus	1946475	0	0	0	0
FAIRWORK Overhead	0	160000	160000	160000	480000
FOWIGS Overhead	0	0	79688	0	79688
		0	0	0	0
B) Expenditure:	1269095	516000	516000	516000	1548000
B1) Salary contributions (research administrator)	24845	0	0	0	0
B2) Catering and Functions	207885	20000	20000	20000	60000
B3) Bursaries & Scholarships	574563	350000	350000	350000	1050000
B4) Transport, Travel and Subsistence	211654	46000	46000	46000	138000
B5) Miscellaneous	2830	5000	5000	5000	15000
B6) Conference/Workshop Organisation Costs	101894	35000	35000	35000	105000
B7) Admin & Operating Exps	31050	10000	10000	10000	30000
B8) Conf PG student reg fees	114375	50000	50000	50000	150000
Closing Balance = Opening Balance + Income - Expenditure	2556517	2575517	2674205	2693205	2693205

FIGURE 7: 3-YEAR FINANCIAL SUSTAINABILITY FORECAST

ACHIEVEMENTS SINCE LAST REVIEW

Before addressing the challenges and opportunities for the future, it is appropriate to first reflect on CITANDA's major achievements since the last review.

Research outputs in the form of publications in the department has almost doubled in the review period when compared to before. Graduations of post-graduate students has risen even more. This is despite having the same number of staff and an increased workload - both quantitatively since the department minimum workload standard was increased from 200 to 250 'contacts'; and qualitatively given the sharp increase in post-graduate students requiring dedicated, time-intensive 'one-on-one' supervision.

In addition to lifting the quantity of research outputs, another ambition was to further increase the quality of research outputs. This has been achieved to a certain extent, in that the proportion of journal articles has increased sharply – it basically doubled – in the period under review. In absolute terms, the annual number of journal articles is more than twice that of the first period of review, and more than quadruple the number of average number articles in the pre-2009 period. We also have more articles being published in journals where we would like to be seen publishing (EJISDC, AJIS, IT4D etc.).

A major concern arising from CITANDA's first review cycle was to ensure a viable long-term financial sustainability model. Initial initiatives involved voluntary contributions from IS staff out of their URC Block Grant funds, the intention to commercialize our research reports and student theses, inviting corporate sponsorships, running workshops to generate surplus, academic conference surpluses etc. The long-term aspiration was to have a funding model based on research grants. However, financial independence and sustainability was achieved very quickly through the considerable surplus generated by the first phase of the ESEFA project, which has created an ample financial reserve equal to many years of recurrent expenditure. More recent research projects also adhered to the agreed strategic principle of including overhead charges explicitly and these will provide ample funding – well in excess of CITANDA's budget requirements – for at least the next 3 years.

FUTURE CHALLENGES AND OPPORTUNITIES FACING CITANDA

This section presents some perceived challenges and opportunities presented to CITANDA. It is hoped that the review committee will identify additional opportunities, and perhaps it will also uncover additional challenges to be addressed during or after the review.

CITANDA's role in the School of IT and its relation with the ICT4D Centre

Despite the successes, there are a number of challenges facing CITANDA. Perhaps a 'false' challenge is for CITANDA to clarify its role in the newly formed School of IT. Traditionally, CITANDA served the Department of IS but the new school means closer relationships with the Department of Computer Science (CS). Currently, there is no desire of CS staff to join CITANDA; nor does CITANDA see itself playing a role in the CS department.

However, the Centre for ICT4D (Information and Communication Technologies for Development), which originated in CS, has a part overlap in area of interest and research with CITANDA. During the past few years, IS staff and students with an ICT4D focus have been invited and encouraged to join the ICT4D Center and therefore belong to *both*; in fact, the Director of CITANDA is also on the executive of the ICT4D Centre, and the current ICT4D Director is a member of CITANDA. The large majority of the ICT4D Centre researchers are from the School of IT (CS and IS). These overlaps might be confusing, hence the need to clarify the roles of both and promote synergies between the two.

Top-ranked journal visibility

Despite a stated intention during the past review cycle, we have made erratic headway in getting publications in the discipline's A+-ranked journals (AIS Top 8). Part of the reasons are that many of the staff has only recently started on their research career and only obtained their PhDs less than 10 years ago. Thus, the instinctive reaction has been to first add to the length of the CV, rather than focus on a few high-impact publications. The staff's high and increased workloads, the top journal's lengthy review cycles, the required high innovation in research topics, and perhaps the lack of strong networks are other contributing factors. There have been several attempts as work from recent PhD projects has been submitted to these top journals, with only very marginal success. It must be noted that the number of IS researchers globally has increased substantially, and the competition to publish in these A+-rated journals has become extremely fierce. One can indeed question the rationale for targeting solely the A+-rated journals given the practical limitations IS researchers face in terms of resources and workload versus the potential gains to be made from these publications. Perhaps a focus on more relevant A- or B-rated international journals is a more appropriate and wiser application of effort. The latter, for example, includes high impact factor ISI journals in the "Information Science" category such as *IT for Development* journal, and *Telematic & Informatics*, where we have had recent success.

Website and social media presence

The CITANDA website has remained stagnant and its social media presence is effectively nil. Part of the website 'issue' has been the lack of web developer capacity in the CommerceIT, the unit responsible for maintaining the Commerce Faculty's website – the

single position was vacant for almost 3 years -, UCT's transitioning from the old to the Drupal platform, and the lack of time of CITANDA staff i.e. the Director. The School of IT has launched its own website, so given the appropriate resources, the CITANDA website could be 're-launched', perhaps using some of the content in this review report, along with contributions from a web consultant.

Research administration support

A weak point for the department and CITANDA remains the lack of research administration support. Twice a dedicated research administrator was appointed in the department (at one stage co-funded by CITANDA), but in both cases, the staff proved incapable of actually relieving the researchers from research administration; indeed, often they added to the researchers' workload and frustration levels due to lack of relevant competencies. Luckily, we recently managed to appoint a very capable and motivated administrator in charge of the financial administration, but she is overloaded.

Productive use of financial reserves

Given CITANDA's considerable reserves when compared to its current expenditure patterns, one can ask whether there are no ways of investing these reserves productively to further the goals of CITANDA and further improve research in the IS department. The review panel is invited strongly to suggest suitable avenues or options. However, it must be noted that just appointing a full-time Director for two years would consume all the financial resources, so the size of the reserves is actually relatively small in the bigger picture.

More externally funded research projects

A challenge raised at the previous review was to obtain specific funding to support a dedicated CITANDA infrastructure and specific research projects. This would further stimulate the research cooperation between academic staff, allow for dedicated support staff, fund (and thus attract) post-graduate students and post-doctoral students in earmarked research areas and enhance the sustainability of the Unit. However, it is recognized that the current research funding climate in South Africa is not conducive to this type of infrastructural funding.

A more viable option is to have more focused research areas with identified research funding proposals. The core constraining factor is lack of time of staff to work on funding proposals, as well as possibly a lack of experience and insufficiently large network in the funding arena of the key CITANDA staff. Current staff workloads are unlikely to be relieved in the foreseeable future. Attracting additional 'big project' funding has also not been a very high priority of CITANDA or staff in the department, as other activities related to improving the publication profile, Masters/PhD graduations and individual's research agendas have taken precedence. Going forward, it is hoped that the successes in attracting funding for specified research projects by CITANDA (Fairwork, FOWIGS), but also other IS staff (e.g. Prof Ulrike's GCRF funding for Gender-Just Digital Innovation in Africa) or Prof Brown's funding to establish a Cyber-Security Centre) will spread both the proposal writing experience and motivation to other staff members. However, the capacity of existing Departmental staff to take on additional substantive research projects remains limited.

CONCLUSION

This second five-year review report has highlighted the successes of CITANDA, and pointed to areas in need of improvement.

One of the big areas of success has been in the Department and CITANDA's ability to attract PhD candidates (and increasingly Masters candidates) from across the continent in line with our goals. Even candidates from the developed North have enrolled. The number of Masters graduates per annum has almost doubled from the previous period from 10 to 20 annually and the number of PhD graduates more than doubled, now averaging more than 10 annually. Challenges remain in terms of supervisory capacity given that most staff are at their maximum capacity; and in terms of throughput, with too many PhD students taking too long or dropping out of the program due to personal, work, or financial reasons.

CITANDA and the IS Department have been enormously successful in increasing the quantity of research outputs over the past decade. The level of DHET-accredited research publications is, on average, *twice* that of the period prior to the current review period (73 p.a. ⇔ 36.5 p.a.). Additionally, the *quality* of the research outputs is also steadily increasing, with the relative proportion of journal articles also increasing quite dramatically, doubling even within the current review period. CITANDA needs to be mindful of selecting journals that are appropriate for the topic at hand, but also accredited by the authorities. In this way, the impact and visibility of our research will be improved. It is fortunate that several journals suitable for our development-oriented research were accredited just prior to the review cycle, e.g. *African Journal of IS* (IBSS); *Electronic Journal of IS in Developing Countries* (IBSS); *Journal of Community Informatics* (IBSS), *IT for Development* (ISI), *Journal of Global IT Management* (ISI). Previous research published in such outlets has been invisible in the subsidy-earning publication count, despite the appropriateness of the journals. Going forward, these publications will now be visible and recognized. Beyond this, however, it is still incumbent on CITANDA researchers to target their work at the A+(AIS Top 8) journals too. There is a general dearth of research from African scholars, located in Africa published in these top journals.

Arguably our most successful research interventions are the annual academic paper writing workshops and the financial support provided to post-graduate students wishing to present their papers at local and international conferences.

We have on a regular basis hosted local and international conferences, and extended invitations to eminent scholars such as Prof Nik Hassan, Prof Richard Baskerville, Prof Robert Davison, Prof Frantz Rowe, Prof Kalle Lyytinen, Dr Virendra Kumar, Prof Brian Pentland, Prof Suprateek Sarker, Prof Donald Wynn. These international links have been positive and spawned ongoing research collaborations.

There have been excellent successes with funding proposals. Apart from the ESEFA project which secured a generous financial reserve for CITANDA's ongoing operations, CITANDA was specifically contacted by Oxford and Manchester Universities to participate in the GCRF-funded Fairwork project, with a budget of approximately R2.5 million for the first phase. Additional funding has already been secured from the GIZ for a project extension. Additionally, a related "Future of Work in the Global South" R1+ million research project driven by CITANDA was successful whereby the South African experience and expertise will be used to replicate the Fairwork research in Ecuador, Indonesia and Chile. Several

more GCRF and other funding proposals were submitted by individual staff and CITANDA. Note that these research projects also offer scope for staff development and the securing of postdocs. Prior to the current review period, CITANDA had never employed postdocs.

Financially, CITANDA is secure with ample reserves to cover its current expenditure pattern far into the future. In fact, one of the options is to consider a more aggressive use of its income and reserves into additional research-promoting activities.

CITANDA has set out to be the leading African centre for research into Information Systems, producing worldclass, internationally recognised research outputs and postgraduate students. Our strategic location and role in Africa is acknowledged, and as such we place great emphasis on being both internationally recognised, as well as African in terms of research thrust, and student and staff profile. There has been progress in moving along this path, but there is room for improvement, especially in the marketing of CITANDA. We are committed to this path, and are open to suggestions as to how we may improve.

Finally, CITANDA is committed to making a difference through our research. Through involvement in communities such as Vrygrond, and more recently with ESEFA and the FairWork projects, we are working with government, other universities, schools and business with the aim to have a direct and positive impact in society.

Rondebosch, May 2020.

APPENDIX 1: STAFF PROFILE OF CITANDA

Staff Profile

The table below lists the academic staff members (Citation information from Google Scholar).

Permanent Staff	Current Rank	Highest Qualif.	NRF Rated	Citations*	h-index*	i10-index*
Irwin Brown	Prof (HoD IS)	PhD	Y	3243	27	50
Adheesh Budree	SL	PhD	N	29	3	1
Wallace Chigona	Prof	PhD	Y	1488	17	38
Salah Kabanda	A/Prof	PhD	Y	287	9	8
Meke Kapepo	L	MTech	N	22	3	0
Michael Kyobe	Prof	PhD	Y	548	13	15
Gwamaka Mwalemba	L	MCom	N	30	4	0
Ayanda Pekane	L	MTech	N			
Ulrike Rivett	Prof (Director SIT)	PhD	Y	733	15	22
Sumarie Roodt	SL	PhD	Y	242	8	6
Zainab Ruhwanya	L	MSc	N			
Lisa Seymour	Prof	PhD	Y	679	14	18
Maureen Tanner	A/Prof	PhD	Y	740	12	15
Pitso Tsibolane	SL	MIT/MA	N	12	2	0
Walter Uys	SL	PhD	N	78	3	3
Jean-Paul Van Belle	Prof	PhD	Y	1459	21	46
Contract and Emeritus Staff						
Mike Hart	Emeritus Professor	PhD	Y	449	10	10
Kevin Johnston	Emeritus A/Prof	PhD	Y	1051	27	16
Ojelanki Ngwenyama	Emeritus Professor	PhD	Y	5769	38	67
Elsje Scott	Emeritus A/Prof	PhD	N	580	12	16
Derek Smith	Emeritus Professor	MCom	N	646	13	17

Staff Research Interests**Professor Irwin Brown**

IS in developing countries; IS management; Grounded Theory in IS research.

Dr Adheesh Budree

Economics of technology, ecommerce, data analytics, ICT4D.

Professor Wallace Chigona

ICT for national development; community informatics; and mobile technology for development.

Emeritus Professor Mike Hart

Strategic use of IS; key management issues in IS; business intelligence; data mining and analytics.

Emeritus A/Prof Kevin Johnston

ICT strategy and alignment; use of ICT in business; ICT management issues; open source software.

Associate Professor Salah Kabanda

IT adoption; M and E commerce; ICT4D.

Ms Meke Kapepo

ICT4D; e-health; Adoption and use of ICT in higher Education.

Professor Michael Kyobe

Strategic IT planning; IT alignment; computer security and utilisation of IT to leverage knowledge management; enterprise and IT governance.

Mr Gwamaka Mwalemba

Enterprise resource planning; business process re-engineering; ERP education.

Ms Ayanda Pekane

Cloud computing.

Emeritus Professor Ojelanki Ngwenyama

Developing and using critical social science methods for IS research. Empirical research focused on: software process innovation; IS implementation; IS management; the impact of ICT on social and economic development.

Professor Ulrike Rivett

ICT4D; service delivery through mobile technologies; e-government and m-government; water quality management and monitoring; innovative use of ICTs; Women in IS; Design Science in IS; health informatics.

Dr Sumarie Roodt

IS and Education: Technology-enhanced learning with a focus on using emerging technologies for the Net Generation, Digital Game-Based Learning (DGBL), Virtual Worlds, Educational Neuroscience & Technology- Enhanced Learning. IS and Business: Using emerging technologies for Competitive Advantage.

Ms Zainab Ruhwanya

Information Security

Emeritus A/Prof Elsje Scott

Object-orientated programming and methodologies; efficient teaching methods for programming concepts; IS project management.

Professor Lisa Seymour

Enterprise systems and business process management with a developing country focus.

Emeritus Professor Derek Smith

Project portfolio management; project teams; project manager competencies.

Associate Professor Maureen Tanner

Agile, Global Software development.

Mr Pitso Tsibolane

Platform economy; ICTs in townships; frugal IT; transformation in IT; ICT4D; ICT and post-colonialism; internet studies and Southern theories.

Dr Walter Uys

M-learning; ICT curriculum; ICT skills; cloud computing.

Professor Jean-Paul Van Belle

Adoption of IT innovations; ICT4D; e-commerce and m-commerce; e-government and m-government; open source software; ICTs and SMEs; cloud computing; D4D.

APPENDIX 2: CITANDA’S PREVIOUS REVIEW WITH RESPONSE

Introduction

The previous review report, although relatively short at six pages, was very complimentary in its review of CITANDA’s activities since its formation as a research unit.

Although the report omitted to recommend the continued accreditation of CITANDA, we believe that this is implicit in the review committee’s achievement ratings for the unit’s objectives as stated in the initial foundation document. To re-iterate, the review committee rated a 70% to 100% achievement rate for all objectives bar one: provide a unique branding to the research of the department (70% achieved); coordinate the department’s research activities (80% achieved); focus the research done by its members into four research themes so as to provide more cohesion (80% achieved); attract quality post-graduate students from Africa in prioritized research areas (100% achieved); stimulate IS staff to collaborate in research themes (70% achieved); encourage research publication in high-quality, high impact journals (20% achieved); and provide a platform for fundraising (80% achieved).

On the whole, we had no issues with any of the review report statements, views, conclusions or recommendations. A response to each of the specific recommendations was formulated and a marker statement is provided for which of these have been achieved/completed or not. These will be discussed at the presentation, especially those that have not been achieved because that was sometimes done on purpose.

CITANDA’s Response to Review Recommendations

We use a table format to respond to each of the recommendations.

Recommendations	Response / Actions to be taken
Draft a 5-year strategic plan for 2014-2018: The self-evaluation report did not show the impact on development, this could be included in a strategic plan; Create new research themes/areas, for example, Health Informatics, Cyber-Security, Business Intelligence/ Analytics & Mobile Technologies;	JP to draw up and provide a draft 5-year strategic plan before the end of first semester 2014, drawing on the strategic research plans of UCT, Faculty and Department of Information Systems. All CITANDA members to discuss and finalize by end July 2014. ACHIEVED
Pursue cross-discipline research collaboration;	A guideline (i.e. formal suggestion) to be established that each CITANDA member should aim to have at least one research collaborator in a non-IT dept. Ideally, these collaborations should consist of a <i>pair</i> of CITANDA associates working with non-ICT research collaborators, allowing for staff development and continuity. PARTLY ACHIEVED

<p>Persue international research collaboration including the joint preparation of articles for high impact journals;</p>	<p>Although this was singled out as the weakest of all achievements, significant process has already been made with at least two publications in top IS journals. The recent 50% appointment of a ‘top 50 IS scholar’ in the department should not only increase the number of publications but also enhance capacity. ON to conduct a workshop on getting to high-impact journals and provide ongoing mentorship.</p> <p style="text-align: center;">NOT ACHIEVED</p>
<p>Persue provincial government research collaboration including applied research projects in provincial government;</p>	<p>A number of initiatives have and are still being undertaken including a workshop series for provincial government, the IT innovation landscape research project which resulted in a new postgraduate diploma for ‘business analysts’. Currently another project is under way, investigating the shortage of software developers and proposing actions. We have a number of post-graduate students doing their research in local and national government; perhaps these must be enlisted into developing more formal applied research projects. Other local government stakeholders with whom we are currently engaged are CITI (Cape IT Initiative), City of Cape Town and the national Department of Trade and Industry.</p> <p style="text-align: center;">NOT ACHIEVED</p>
<p>The future funding of CITANDA must be carefully considered. Presently the funding is mainly situated in the different research grants. In order for CITANDA to grow, capacity to:</p>	<p>This is a critical issue if we are to continue attracting postgraduate students with bursary funding around core research themes. We propose to have a formal ‘multi-purpose’ funding proposal by end of year (the Faculty’s funding proposal writer – Dr Harold Kincaid to be roped into this effort). This will depend on and take into account the strategic plan as well as the operational model to be developed (see below).</p> <p style="text-align: center;">NOT ACHIEVED</p>
<p>Pursue the development of an operations model for CITANDA that will among other things motivate departmental researchers to have their research grants formally administered by CITANDA;</p>	<p>The operational model will need to be linked to the financial plan and these will be part of/derive from the strategic plan. We are not keen to directly ‘tax’ current academics, especially not on existing contracts. However, we are likely to propose that all incoming funding include a 10% departmental administration fee (on top of the faculty/university admin fee). The currently employed research IS department admin staff member is funded partly out of CITANDA income although our fund is about to run empty. The department has no GOB funds to fund this</p>

	<p>position so staff needs to realize that this person has to be funded somehow.</p> <p style="text-align: center;">ACHIEVED</p>
Investigate the development of a financial model for CITANDA;	<p>Yes, part of the operational plan.</p> <p style="text-align: center;">ACHIEVED</p>
Appoint a Research Administrator managing CITANDA administration specifically;	<p>If future funding allows. The current departmental research administrator which also manages CITANDA is funded using soft money.</p> <p style="text-align: center;">NOT DONE/ACHIEVED</p>
Actively promote and include new and younger academics in research themes/areas;	<p>I have a feeling this is mostly achieved already. Rather buy-in from all staff into the CITANDA brand is essential - the monthly dept research meetings should help with that?</p> <p style="text-align: center;">ACHIEVED</p>
Encourage new and younger PhD academics to apply for NRF ratings in the category: Promising young researcher;	<p>This has been done. Maureen Tanner and Salah Kabanda are in the process of applying.</p> <p style="text-align: center;">PARTLY ACHIEVED</p>
Promote co-supervision with younger researchers and academics;	<p>Masters – all are already supervising Masters.</p> <p>PhD – already happening for MT and SK. Still to do for Meke, Sumarie & Jacques in next cycle of supervising appointments (mid-2014).</p> <p style="text-align: center;">ACHIEVED</p>
Implement a policy that each Master's degree student must submit a paper to an accredited conference or journal before handing in the dissertation;	<p>This has been implemented with immediate effect as part of the course requirements of INF5004W (MK)</p> <p style="text-align: center;">ACHIEVED</p>
Implement a policy that each PhD student must have an article published in an accredited conference or journal before the submission of thesis;	<p>This will be implemented as soon as possible. A proposal to change the degree rules needs to go to APPC. (IB)</p> <p style="text-align: center;">PARTLY ACHIEVED</p>

Reward master's and doctoral students for publishing articles in an accredited conference or journal, for example R5000 for refereed conference and R10000 for journal publication;	Funding is the issue - hardly any of the unit's/dept's research-output related funding flows back to the dept so other funding needs to be found. I think this is unworkable unless (1) dept's funding position improves; or (2) UCT moves to a different research income distribution model. PARTLY ACHIEVED
Consider requiring PhD students to take 2 post-graduate INFO content courses. The result should be an increase in the depth of the student's INFO content knowledge, which could offer more options for research, as well as make them better prepared to teach INFO content courses;	(Note: this is mainly for interdisciplinary applicants that don't have an under/postgrad background in information systems.) This is already a discretionary admission requirement but we have not made much formal use of it in the past. To be revisited. NOT DONE/ACHIEVED
CITANDA's role — Maintain the present status quo and not limit research to ICT4D only.	Noted - and thanks for this input ACHIEVED

Conclusion (Note: as per original submission in 2014)

It is our belief that CITANDA has, to a surprisingly large extent, achieved virtually all of its objectives in its first five years of existence, despite a pronounced lack of financial resources. We are hoping that the proposed strategic, financial and operations plans will lead the way to increasing CITANDA's resource base and further its goals.

The review was very useful in providing an external and more objective assessment of CITANDA's achievements, although perhaps the process was a bit too formal and resource intensive given the relatively modest scope and resource base of CITANDA activities. Perhaps the Committee can consider a light-weight version of the review process for small research units under review?

For CITANDA:

Prof Jean-Paul Van Belle
(Director)

Prof Irwin Brown
(Deputy-Director)

Prof Lisa Seymour
(HOD, Information Systems)