THE YEAR INFORMATION & COMMUNICATION TECHNOLOGY SERVICES GOT FLIPPED

2016 Annual Report by the ICTS Executive Director

INTRODUCTION

Welcome to the University of Cape Town's ICTS Departmental Annual Report. It is a privilege to present this report at a time when the way technology challenges are dealt with today, plays a significant role in the future position of UCT.

In 2016 we have seen massive disruptive change driven by changes in the political arena, financial domain and technology disruptions. The landscape for Universities in South Africa has changed forever.

The effects of austerity, due to decreased funding, has already led to a reduction of 32% on ICTS operational budget and a 12% reduction in staffing.

Every part of the UCT business today is a technology business, where data is the key asset, and ICTS is looked onto to provide solutions that could drive innovation and improvement on business delivery.

As the Higher Education industry in

". . . UCT's business today is a technology business, where data is the key asset . . ."

SA will have to completely reinvent itself, the leading Universities should effectively be exploiting technology to transform relationships and processes.

With the number of connected devices projected to grow from 15 billion to 200 billion by 2020, ICTS has more opportunity than ever before to influence how UCT could innovate through technology.

ICTS will have to be placed at the heart of UCT's decision frameworks and needs to be enabled to have the right level of oversight and governance.

ICTS will continue to focus on innovation, cyber security and the protecting of UCT's assets.

Sakkie Janse van Rensburg, Executive Director of ICT at the University of Cape Town.

I have a long and successful track record of developing ICT strategies in the higher education sector. At UCT my role is to apply technology to benefit academic, administrative and research functions at the university. I am also responsible for the transformation and optimization of business processes and the use of ICT to deliver improved capabilities.

With over 25 years' of experience, I see my role as acquiring in-depth knowledge of the higher education sector, university strategies, operating models, research technologies and trends in the market, and the potential

to apply this knowledge to the university.

My focus areas include the development of mobile applications and the shift to cloud computing. I am involved in many initiatives including the development of a Leadership Institute, and a drive to give all UCT students free internet access. I am also passionate about developing the next generation of CIO's.

"I remain passionate about developing the next generation of CIOs"

"Today, companies have to radically revolutionize themselves every few years just to stay relevant. That's because technology and the Internet have transformed the business landscape forever. The fast-paced digital age has accelerated the need for companies to become agile." - Nolan Bushnell

QUICK OVERVIEW

During January 2016 we stated the following to UCT management:

The consolidation of ICT services will begin. As experienced austerity reaching a high in 2016, many departments approached ICTS to consolidate their services. This included the consolidation of ICT services with the Libraries, the GSB , and many other faculties.

UCT will be involved in a major Cyber Security incident within three years! UCT has now allocated budget to Cyber Security, and the Cyber security program is well underway. No major incidents occurred in 2016.

ICTS will be recognised by UCT as an enabler and NOT as a cost Centre within the next three years! This first Annual Report from the ICTS office is the result of this statement, demonstrating that value was delivered, and that it is not an operational cost.

With the current ICT Investment model, ICTS service delivery will move from AQL (Acceptable Quality Level) to RQL (Rejected Quality Levels) within three years! 2016 ended with no degradation of services, despite the loss of 11 staff members due to voluntary separation and early retirement packages. It must be noted that the 32% cut in operating expenditure will affect ICTS' ability to develop new skills as most of its training budget was removed.

UCT will start investing in their strategic initiatives e.g. eResearch, within the next three years! For the first time in 2016, we saw well-balanced funding allocations across the three core domains of Teaching and Learning; Research; and, Support services.

ICTS will move all the key components to the cloud by 2020! In 2016 ICTS adopted a Cloud First Strategy to aim for this goal.

By 2018 UCT will abandon their unsupported Laptop project! This long-delayed project was finally funded in 2016 for the 2017 student intake.

By 2017 UCT will be no longer be the employer of choice and ICTS will be short skilled by 2019! With 114 years of experience lost due to austerity, the political climate and funding constraints, the loss of experienced human resources remains a big challenge for 2017.

ICTS will run out of Operational Funding by 2017! We made 2016 within budget. and remain committed to achieving all our budget targets
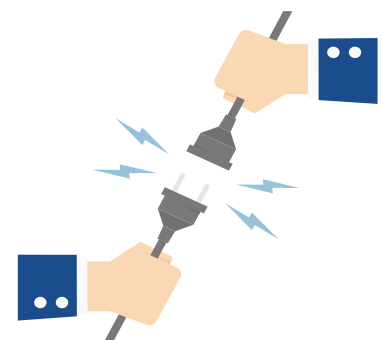
What if ICT disappeared and was no more?

The challenges we are currently facing

How UCT is meeting these challenges into tomorrow

IN THIS REPORT

*"CIOs cannot effect change at any scale
without strong business relationships. To build these relationships,
CIOs have to focus on branding, collaboration and communications."*
Gartner 2016

IAN CHRISTIAAN
SMUTS
1870 – 1950

*Life was gentle, and the Elements
mixt in him that Nature might stand up,
say to all the world: This was a man.*

THE PEOPLE ... OPGERIG DEUR DIE MENSE VAN KAAPLAND.

"Once you have an innovation culture, even those who are not scientists or engineers - poets, actors, journalists - they, as communities, embrace the meaning of what it is to be scientifically literate. They embrace the concept of an innovation culture. They vote in ways that promote it. They don't fight science and they don't fight technology." - Neil deGrasse Tyson
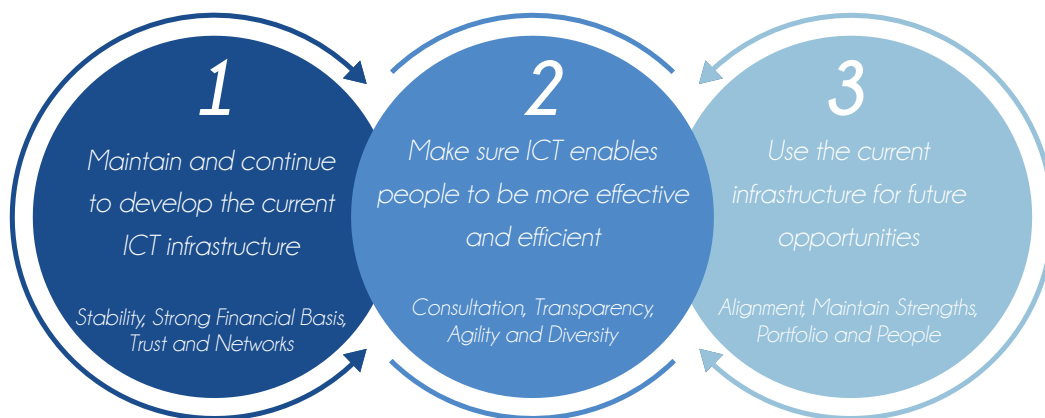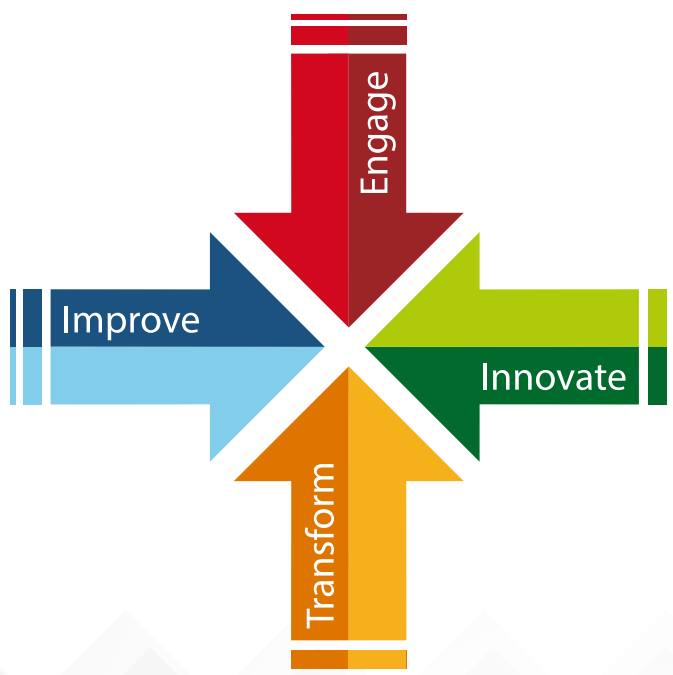
STRATEGIC LANDSCAPE

Past Strategy 2009- 2015

The 'Enabling People' Strategy served us well. We need to build on this by remembering the three drivers:

1

Maintain and continue to develop the current ICT infrastructure

Stability, Strong Financial Basis, Trust and Networks

2

Make sure ICT enables people to be more effective and efficient

Consultation, Transparency, Agility and Diversity

3

Use the current infrastructure for future opportunities

Alignment, Maintain Strengths, Portfolio and People

New Strategy 2016 - ICTS 2020

Engage

Improve

Innovate

Transform

Continuous Improvement
"Measurement is the first step that leads to improvement. If you can't measure something, you can't understand it. If you can't understand it, you can't improve it." - ITMT, derived from Harrington

Engagement
Engagement is not accidental and three drivers contribute to a highly engaged workforce, including maintaining infrastructure, enabling people and gaining economies of scale.

Innovation
Innovation can be viewed as the application of better solutions that meet new requirements or existing needs. Innovation is the creation and successful implementation of new ideas and inventions that make a real difference through the generation if tangible outcomes with social and or financial value .

Transformation
Breaking decisively with past discrimination and promoting internal social justice. Our main objective in the next 5 years is to forge a common ownership of UCT through valuing and affirming diversity; actively engaging with our African identity and becoming more representative of the demography of our country.

"Technology is a license to operate in today's economy, and the technology choices made by an organisation should be driven by its business needs. Given the sizeable investment organizations are making in technology, if they are to fully capture all of the benefits of that technology, they need to ensure that those investments are secured and that the organisation will be resilient in the face of a cyber attack or other technology failure."
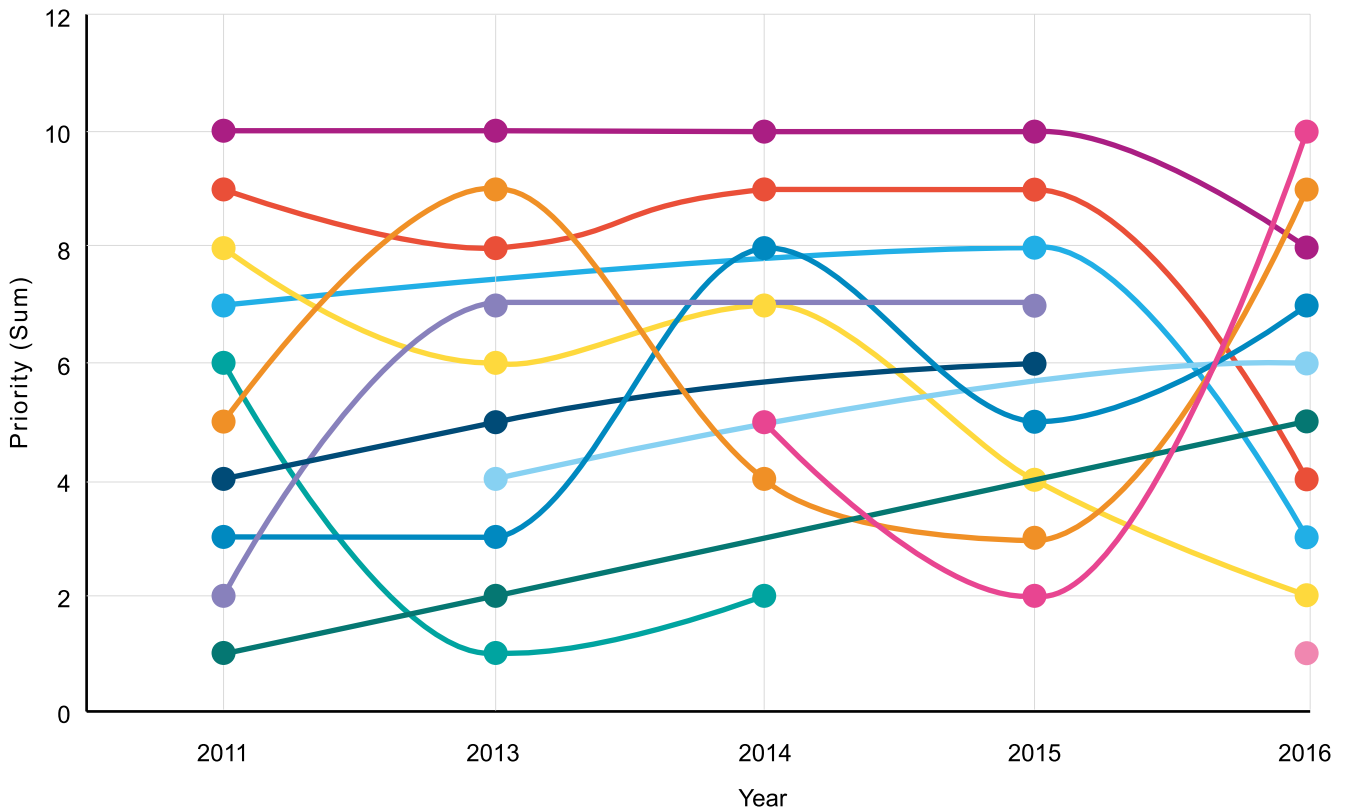Chris Verdonck - Cyber Risk Leader - Deloitte Belgium.

STRATEGIC CHALLENGES ICTS

## TOP 5 CHALLENGES FOR 2016 EXPLAINED

Legend:
- Reducing enterprise costs
- Improving business continuity, risk and security
- Executing enterprise strategy
- Creating new products, services and Innovation
- Consolidating business operations
- Increasing the use of information/analytics
- Attracting and retaining customers (students, partnerships and research)
- Attracting and retaining the workforce
- Improving business processes
- Improving institution workforce effectiveness

Watson analytics of the ICT Landscape at UCT over the last 5 Years (Research performed by Sakkie Janse van Rensburg in collaboration with Gartner CIO annual research) The diagram above clearly illustrates the "FLIPPED" ICT environment UCT has moved into.

STRATEGIC CHALLENGES

1. Reducing enterprise costs
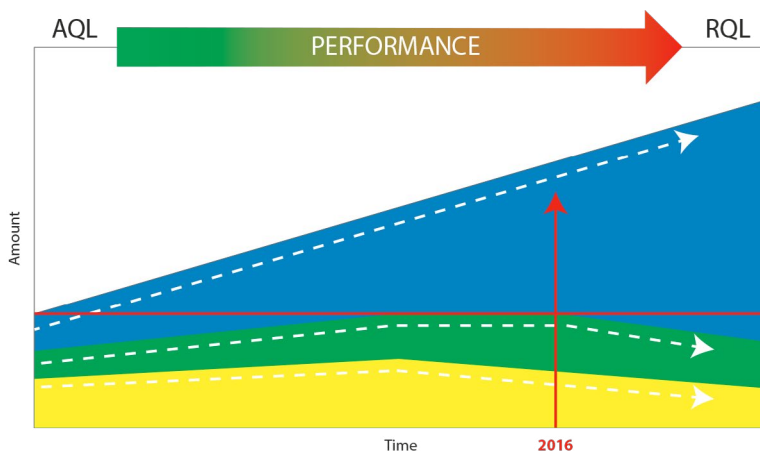
This graphic illustrates the danger of ICTS moving from AQL (Acceptable Quality Level) to RQL (Rejected Quality Levels).

■ *Increasing Demand for Services*

■ *Our ability to deliver in the current conditions*

32% budget decrease for operational costs.
12% budget decrease for staffing costs.

■ *Decreasing Skills Set*

■ *Decreasing Budget*

The UCT budget pressures affected ICTS and many cuts were made. Due to the impact, operational costs were mostly taken from the ICTS training fund and did not only have a strategic impact on transformation but also in our ability to attract and retain the highly skilled workforce needed. The impact of this will be felt for years to come.

With the cascaded implementation of VSP's (Voluntary Separation Packages) at UCT, ICTS lost more than 114 years of skill. The secondary effect of VSP's was that staff felt insecure and a further 8 staff members left. They were mostly from the designated groups and this had a serious effect on the ICTS transformation plan.

"Big enterprise changes require fact-based decisions regarding IT investments and costs. A critical evaluation of IT capabilities — past, present and future — is the cornerstone of delivering business value. In general, clients find their journeys with benchmarking are more successful by participating in surveys, and in effect, they 'get better at benchmarking by doing benchmarking'."
Gartner 2016

2. Improving business continuity, risk and security
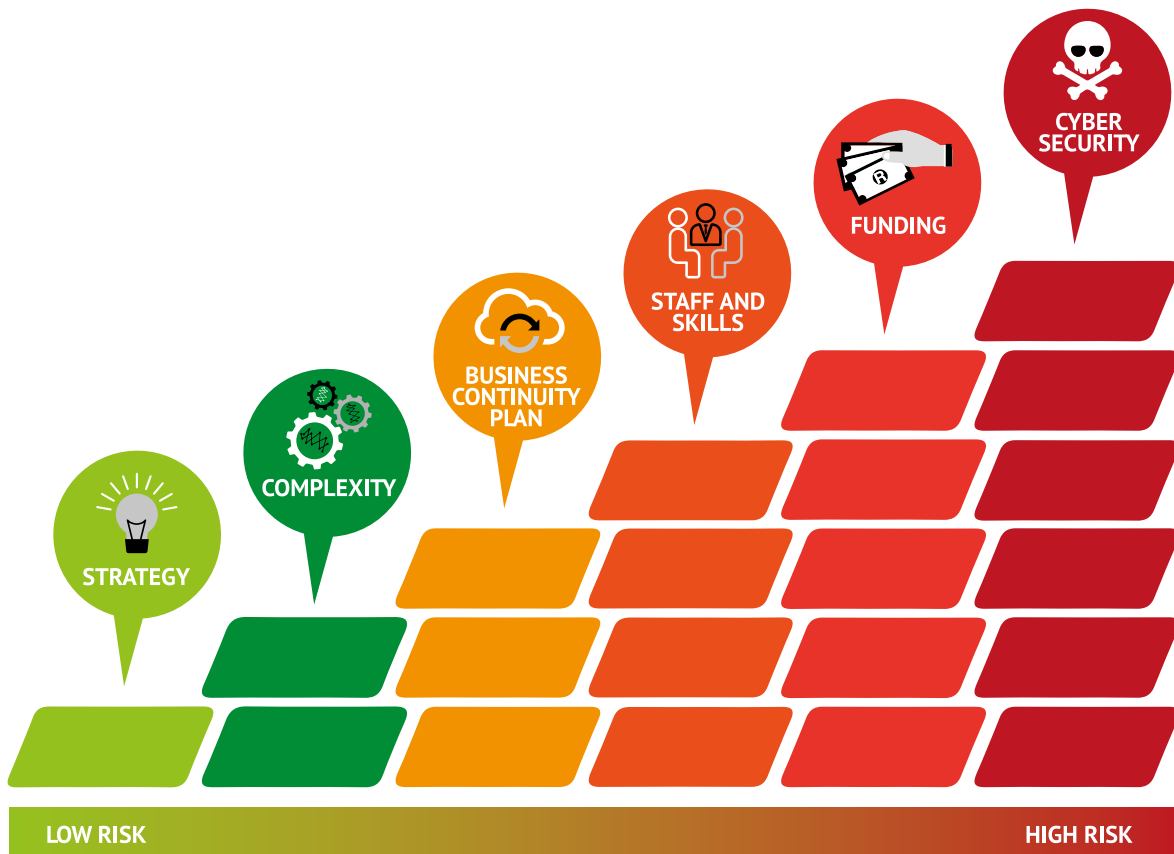
ICTS Risk Register as approved by RMC on the 19th May 2016.

ICTS started in October 2015 with the development of a holistic, agile approach to information security to create a secure network, develop security policies, and reduce institutional exposure to information security threats. Pressure was put on UCT from it's insurers due to the violence originating from the Fees Must Fall movement. ICTS adopted the NIST security framework.

Not only was UCT the first to adopt the NIST security framework but also the first to implement a CSIRT (Cyber Security Incidence Response Team) and the first subscribers to the BitSight Security Ratings Platform. UCT was the first rated at a BitSight score of 450 (Below the Higher Education average), ICTS started with active response to all threats reports and has since September 2016, increased the BitSight rating to 540 - thereby reducing our risk footprint by 20%.
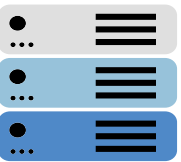
"There are risks in every aspect of ICT. Understanding the ICT risks we face and managing them will enhance our ability to make better decisions and execute our strategies."
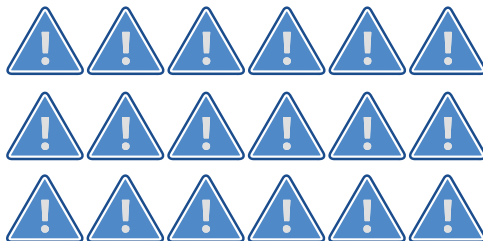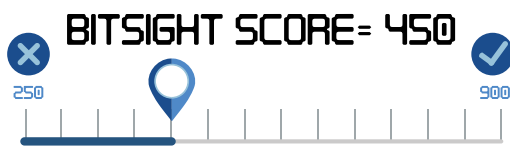
CYBER SECURITY AT UCT

1
MAJOR HACKING **INCIDENT**
(where performance was impacted)

1
CYBER CRIME INVOLVING ARREST

1
CYBER TERRORIST **INCIDENT**

1
HACKING OF STATE INFRASTRUCTURE

BITSIGHT SCORE= 450

250   900

18 TAKE DOWN NOTICES

DDoS ATTEMPTS PER DAY
2,756,000

1 CEO PHISHING AT UCT

2 UNATHORISED USE OF THE UCT MAIL SYSTEM

ICTS CYBER SECURITY BUDGET = 0.00

Motivate   Protect
Educate   React
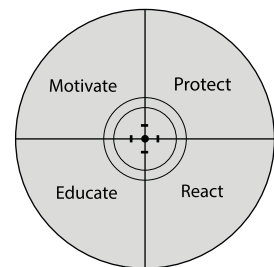
Top two strategic challenges: cyber security and financial pressure. With very little budget UCT managed to start monitoring their cyber security footprint (BitSight). First University in SA to establish a CSIRT (Cyber Security Incident Response Team) and using BitSight as a metric, UCT improved its score by 20%.

"As cybercrime becomes more prevalent in society, universities will feel their share of the impact. Critical research data will become a natural target for cyber attacks."

Paul Hopkins, UK HE-Shared Service.

3. Executing Enterprise Strategy

BECOMING A TH13TEENER

It can be seen from the main strategy graph, that "Executing enterprise strategy" has moved down. This is not due to "Executing enterprise strategy" becoming less important, but rather that Austerity and Cyber Security have risen to the top due to economic pressures and political change and many more cyber attacks on UCT's cyber infrastructure. ICTS has to take leadership in the development of and integrated governance model and the model was implemented in 2016.

Only 13 percent of companies successfully execute their strategy

4. Creating new products, services and innovation

Innovation was added to the ICTS strategy in 2015. We started with implementation in 2016 in order to enhance innovation. Our reporting DVC Prof. Francis Peterson played a pivotal role in supporting ICTS to get this off the ground. Many projects were successful and are dealt with elsewhere in this report. The UCT austerity project with VSP's did not have a good impact on this project and staff, while feeling insecure, did not focus on innovation but rather on their own security and cost cutting. Despite all of this, there were many success.

5. Consolidating Business Operations

Consolidation of Library IT and GSB started in 2016

"No longer can we change our customers perceptions and preferences – we must change the way we work, the way we interface, our systems and our communications when we engage with our customers."

INNOVATIONS
## A First for Universities in South Africa

ARC AFRICAN RESEARCH CLOUD

First Research Cloud in Africa. The African Research Cloud (ARC) building and maintaining collaboration with the North West University.

CSIRT COMPUTER SECURITY INCIDENT RESPONSE TEAM

Part of the strategy is to respond to cyber threats which led to the establishment of the first Cyber Security Incident Response Team at any University in South Africa. This unit is now functional and plays a critical role in not only reacting to threats, but also educating and monitoring Cyber Security.

Neotel LIQUID TELECOM

During Fees Must Fall , UCT was able to take up the offerings from the TENET negotiated deal with Neotel. Not only was UCT the first University to use this offering but it now also is a part of UCT's Disaster Recovery strategy.

Telkom / vodacom / CELL C / MTN
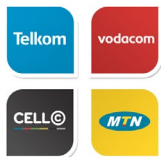
During Fees Must Fall many lectures were provided in electronic format. Students could not get to campus and in order to limit the financial burden of those students from using their Cellular operator, UCT negotiated a Zero rated deal for all students.

During 2016 an increase in crime on and near campus initiated the development of an app allowing anybody in the UCT community to initiate an emergency call for help.

BITSIGHT

UCT became the first University in South Africa to actively monitor and report on their security footprint. This not only improved security awareness but also enabled UCT to increase their security metrics by 20%.

BIG DATA

To address some of the challenges presented by Big Data for researchers, a high speed network had to be implemented. UCT deployed Globus, and in doing so lead the way South Africa would utilize Globus for the national research needs.

INNOVATIONS
A First for Universities in South Africa

After establishing the first eResearch Centre in Africa in 2013, the first Director was appointed to run this prestigious unit.

From time to time the electronic schedule system indicates a Lecture Theatre is booked and in use when in fact it might be empty. QR Codes were deployed at Lecture room doors providing the ability to view whether the room is booked and actually utilised.

UCT led a consortium to build the first regional data node of national cyber infrastructure. Today the Western Cape Data Intensive Research Facility is the first regional data node in the national integrated cyber infrastructure proposed by the Department of Science and Technology.

UCT was the first University to deploy their service desk in the cloud using ServiceNow. Since then UFS and UWC have followed.
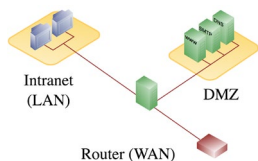
A researcher requires that data moves as fast as possible: typically traditional Firewalls get in the way. To address this problem UCT build and deployed the first (DMZ) Demilitarised Zone for Research.

2016 was a milestone in the deployment of Voice Over Internet Protocol (VOIP) at UCT. This 3 year project has already saved UCT more than R40M.

First to use conversis electronic research administration.

"ICTS not only helps increase business value for the University, it also adds value for every student; from when they arrive at UCT until they leave, from the ideas generated by researchers to beyond their publications. ICTS is pervasive throughout every part of UCT and therefore must help Innovate, Engage, Improve and Transform every part of the process".

ADDING VALUE
Austerity - Creating Business Value
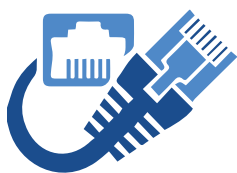
Proactive response to preventing network issues

99 Classrooms updated

Lecture recordings edited and available within 24 hours

Remote Power management unit in lecture rooms

200 in 3 days

Deployed 200 student notebooks in 3 days

Organising ALI since 2011

Hearing Loop — Switch hearing aid to T-coil

Added to lecture venues

Induction for first year students and post docs

714 new machines added in computer labs

Computer lab availability map

Business Intelligence cost reduction

ICTS Vehicle Management

CLEAN AUDIT

Clean IT Audit

Faculty handbooks live

10,248 Million minutes of phone calls
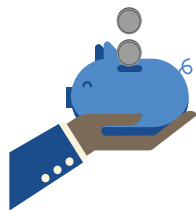
1153 hours of Video Conferencing

ADDING VALUE
Austerity - Creating Business Value

Remote Registration

Replace Spendtrack saving
R 600 000

#SAVE

NSFAS API's developed

Over 20,000,000 CPU Hours
logged since 2014

Successfully supporting
25670 Students, 7779 Staff
and 182 off-site Staff

10,034 Staff and
82,000 Student Mail boxes
moved to the cloud

700% increase in researchers
using ICTS HPC since 2014

500% increase in storage
since 2014

Lync

R32,000,000.00
Lync SAVED 2014 - 2016

138,745,836 viruses
and spam blocked

Online ICTS
Financial Reporting

3520 Wireless Access Points
Largest WiFi network in Africa
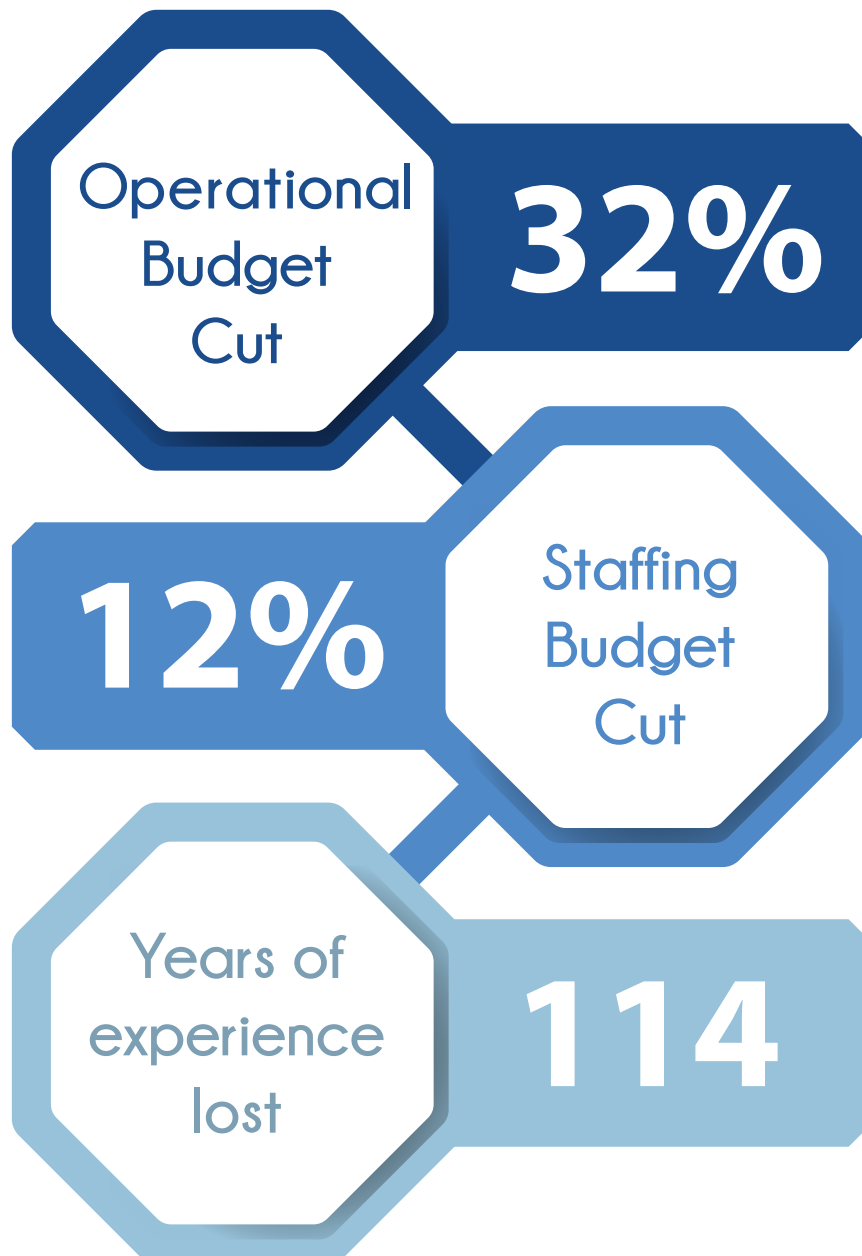
MoU Signed with NWU

156 ongoing ICTS projects

114 Completed Projects

UCT Mobile APP

IMPACT OF AUSTERITY

Operational Budget Cut — **32%**

12% — **Staffing Budget Cut**

**Years of experience lost** — **114**

"ICT can improve everything the University does, whether it is Research, Teaching and Learning or Support Services, therefore if not funded appropriately or in the wrong manner, funding could come to a risk.

ICT FUNDING AT UCT

ICT PORTFOLIO	AMOUNT
Administration and Management of ICT	R 7,783,231
Information Technology Support Services	R 26,822,380
Educational Technology Services	R 10,858,928
Research Computing Services	R 6,467,274
Communications Infrastructure Services	R 26,768,034
Enterprise Infrastructure and Services	R 17,119,400
Information Security	R 1,022,604
Information Systems and Applications	R 45,301,561
TOTAL	R 142,143,412

- Administration and Management of ICT
- Information Technology Support Services
- Educational Technology Services
- Research Computing Services
- Communications Infrastructure Services
- Enterprise Infrastructure and Services
- Information Security
- Information Systems and Applications
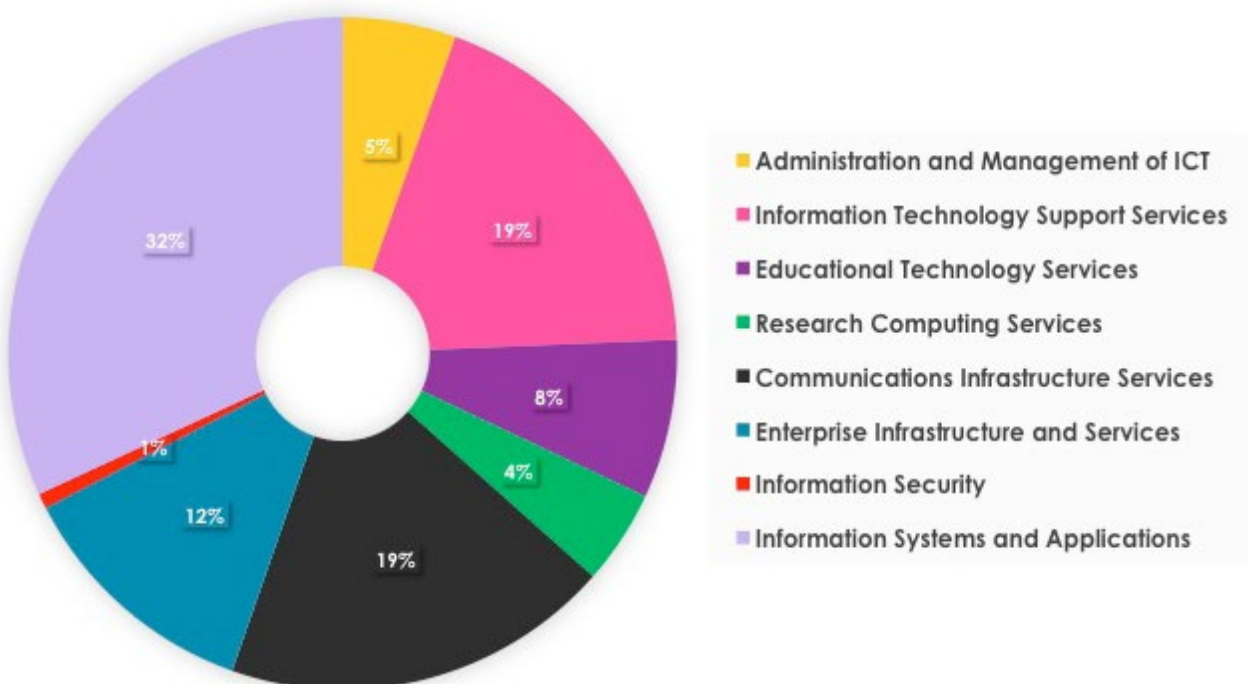
ACKNOWLEDGEMENTS

I would again like to thank everybody in ICTS who worked hard in 2016 to make it a success. Without the inspiration and support for the ICT strategy, from our reporting DVC Professor Francis Peterson, this would not have been possible.

I am still of the opinion that with the current staff complement at ICTS we can take on and solve any ICT challenge.

"Together we can shape the future."

To view this report online

If you think 2016 was a roller coaster ride...
imagine 2017 doing the same,
but with no tracks!!!

THANK YOU

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