REPORT TO COUNCIL 2018/19

NAME OF RESPONSIBILITY CENTRE: Operations and Finance
RESPONSIBILITY CENTRE HEAD: Stan du Plessis
DATE: September 2019

1. INTRODUCTION

Large public universities such as Stellenbosch University (SU) have many institutional objectives and no overriding profit motive. SU adopted a new vision and strategic framework in 2019, setting an ambitious agenda. This is also the agenda of the responsibility centre (RC) of Operations and Finance, comprising the divisions of Finance, Facilities Management, Information Technology, Innovus (including SUNCOM) and Maties Sport.

SU's new mission statement reads as follows:

> Stellenbosch University is a research-intensive university where we attract outstanding students, employ talented staff and provide a world-class environment; a place connected to the world, while enriching and transforming local, continental and global communities.

In the RC: Operations and Finance, we are specifically tasked with delivering "a world-class environment; a place connected to the world". This report describes how this is achieved through a well-equipped staff corps (section 2), through good governance (section 3) and by maintaining an effective network, or "commons" (section 4).

Operations and Finance is committed to deliver on SU's strategy. In this dedicated pursuit, the theme of operational excellence guides our plans and actions. Operational excellence should be understood as a mindset of continuous improvement; not an assessment of the state of the University at any particular point in time, or a specific management methodology. The focus is on the relentless pursuit of efficiency on the one hand, and the cultivation of a culture of entrepreneurship and improvement on the other. In this spirit of operational excellence, and in line with SU's policy on quality assurance, two of our divisions (Finance and Maties Sport) conducted both self-evaluation and external evaluation during the reporting period. The recommendations by the external review panels will be implemented and reported to SU's Quality Committee.

2. THE OPERATIONS AND FINANCE TEAM

The RC comprises five divisions with a total staff complement of 590.

Pictured in figure 1 is the management team of Facilities Management, led by Chief Director Nicolette van den Eijkel. Council recently reappointed Nicolette to head up this division for another five-year term with effect from 1 January 2020.

Figure 1: Facilities Management team members, from left to right: Madeleine Malan (Director: Business Management), Japie Engelbrecht (Director: Project Management), Viljoen van der Walt (Director: Risk Management and Campus Security), Nicolette van den Eijkel (Chief Director: Facilities Management), Nadeem Gafieldien (Director: Property Services), Francois Swart (Director: Development Planning and Design) and Dan Prata (Director: Facility Services).

The management team of Finance, under the leadership of Chief Director Manie Lombard, is pictured in Figure 2. Reinet Uys joined the team in the course of the reporting period as Director: Financial Services.

Figure 2: Finance management, from left to right: Caro Olivier (Deputy Director: Funds and Asset Management), Pieter Wever (Director: Transport Services), Werner Abrahams (Deputy Director: Student Fees and Debtors), Annemi Murray (Director: Financial Planning and Budgeting), Manie Lombard (Chief Director: Finance), Brendon Gindlay-Whieldon (Financial Controller), Reinet Uys (Director: Financial Services), Elizabeth de Beer (Deputy Director: Financial and Management Systems) and Riaan Basson (Director: Purchasing and Provision Services).

Figures 3 and 4 show the management teams of Innovus and SUNCOM as well as Information Technology.

Figure 3: Innovus and SUNCOM, seated, from left to right: Daniell Jacobs (PA & Financial Administrative Officer), Colette Noble (Office Liaison), Monique van Aswegen (Secretary to the Senior Director: SUNCOM), Hein Swanepoel (Senior Director: SUNCOM), Anita Nel (Chief Director: Innovation and Business Development), Carol Kat (Head: Copyright and Short Courses), Sandra February (Administrative Officer: Copyright and Short Courses), Nolene Singh (Technology Transfer Manager) and Christi Wiechers (Senior Commercialisation Project Manager). Standing, from left to right: Doris Peters (Senior Administrative and Finance (Intellectual Property) Officer), Joubert de Wet (Technology Transfer Manager), Gert le Roux (Aquaculture Commercialisation Manager), Stefan du Toit (Innovation and Commercialisation Strategist), Luan Africa (Technology Transfer Officer), Lizane Fuzy (Commercialisation Project Manager) and Camille de Villiers (Technology Transfer Officer).

Figure 4: Information Technology (IT) management team members, back, from left to right: Johann Kistner (Director: Academic IT), Attie Juyn (Senior Director: IT) and Ralph Pina (Director: IT Institutional Software Solutions). Front: Zenobia Davidse (Director: IT General Support Services) and Joe Smit (Director: IT Infrastructure).

Finally, the Maties Sport senior management team, headed up by Chief Director Ilhaam Groenewald, is pictured in Figure 5. Council recently reappointed Ilhaam for another five-year term with effect from 1 August 2019. Moreover, at the end of August, she received a ministerial award from Minister of Sports, Arts and Culture Nathi Mthethwa for becoming the first female member serving on South African Rugby's executive council.

Figure 5: Maties Sport Senior Management Team, back, from back to front: Sean Surmon (Head: High Performance), Gustav Venter (Head: Centre for Sport Leadership), Andy de Bruin (Accountant: Financial Planning and Asset Management), Jerry Laka (Director: Support Services) and Ilhaam Groenewald (Chief Director).

2.1 Staff transformation

The RC's demographic profile is shown in Figure 6. While the RC adopted a well-defined employment equity plan in 2018 and there is considerable diversity in the total staff, the progress towards greater diversity at senior positions has been too slow.
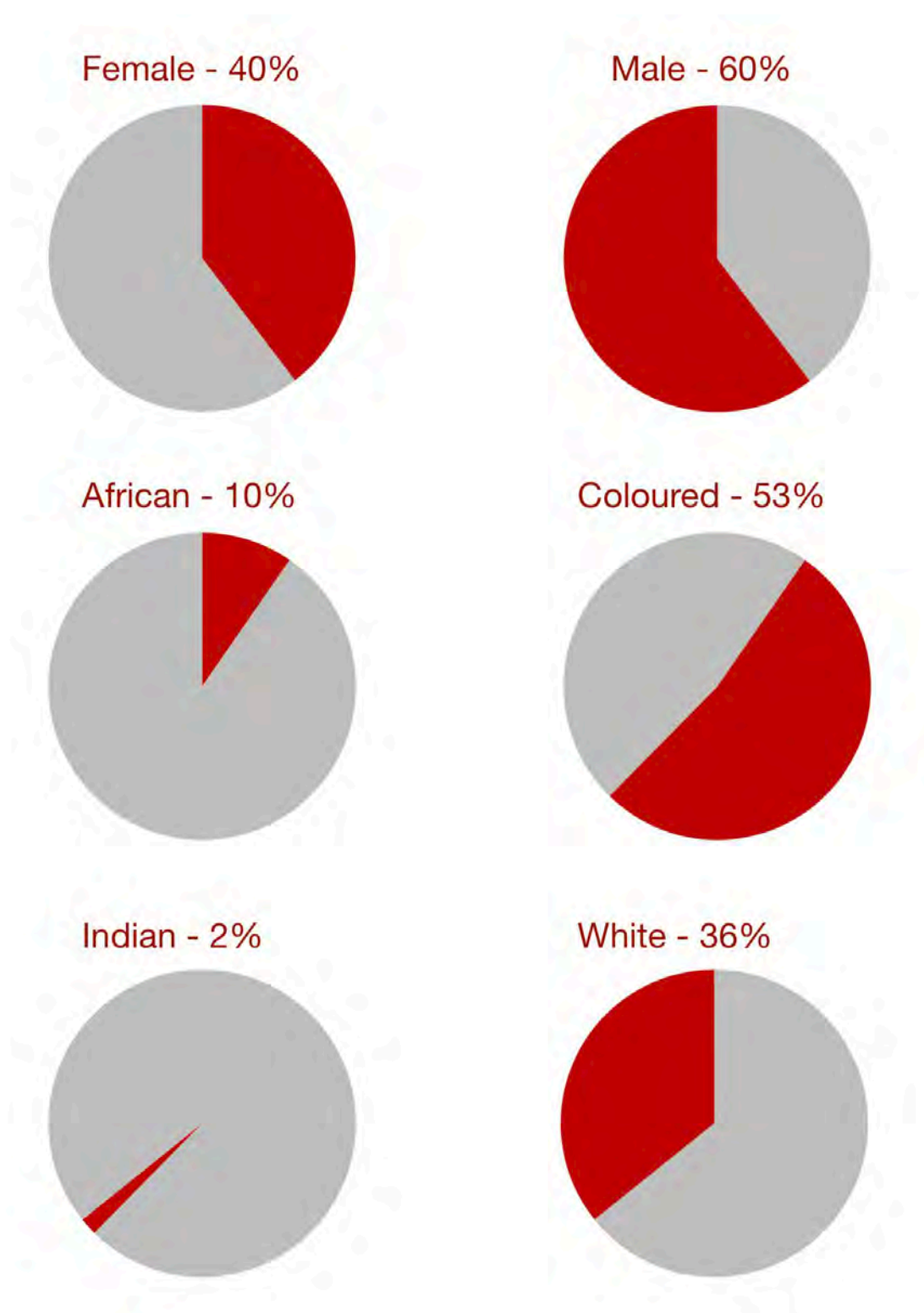
Female - 40%

Male - 60%

African - 10%

Coloured - 53%

Indian - 2%

White - 36%

Figure 6: *Staff composition by gender and race.*

2.2 Building the RC team

2.2.1 Recognition for outstanding work

The University's values of excellence, compassion, accountability, respect and equity guide the RC's actions. These values were also at the core of the discussion between the Chief Operating Officer (COO) and RC staff at the annual staff meetings in June 2019, which were

held at the Adam Small Theatre Complex. At these meetings, the following ten colleagues were honoured for having performed their work in an exceptional manner in the reporting year, serving as role models to their co-workers:

Gwen August (Maties Sport)
Sean Surmon (Maties Sport)
Niven Adonis (Facilities Management)
Yanga Mgijima (Facilities Management)
Wendy Robyn (Finance)
Baryl Strauss (Finance)
Doris Peters (Innovus)
Viola Calitz (Innovus and SU Botanical Garden)
Zenobia Davidse (IT)
Matthew Christians (IT)

Figure 7: COO Stan du Plessis presents Facilities Management's Yanga Mgijima with an RC reward for outstanding service to the University. Yanga joined SU as an assistant, and recently qualified as a carpenter. He was an "early adopter" of the new Planon-enabled tablets issued to technical staff in Facilities Management and has been a tremendous help to his colleagues in making effective use of this technology.

2.2.2 Brand warriors

All Facilities Management (SUFM) staff attended the first phase of a self-development programme called "Brand Warrior", which is set to embed a culture of accountability and shared values in the Division. The 12-week programme centred on the theme "Me, my team, my SU" to ensure that all SUFM staff align in terms of values and accountability so as to establish an increased customer focus.

The next phase of the programme is to strengthen the middle-management/supervisory layer of SUFM, equipping them with the tools to lead teams and manage performance. While most staff have been very enthusiastic about the programme and have shared the positive impact it has had on their lives, some work remains in respect of more reluctant staff who have been with the University for a long time.

2.2.3 Women's Day

On 8 August 2019, the RC again marked Women's Day. This year's celebrations took place at Kronenburg Estate. In 2018, the event was introduced on the initiative of the RC's senior women leadership, and, on account of the positive feedback, it was decided that it would in future be held annually on the day before National Women's Day. At this event, the women of Operations and Finance are treated to lunch, an inspirational talk by a guest speaker, art and entertainment – courtesy of the RC.

Figure 8: Women from Operations and Finance at the RC's annual Women's Day event, which took place at Kronenburg Estate on 8 August 2019.

3. GOVERNANCE IN OPERATIONS AND FINANCE

3.1 Sector-wide funding pressures bearing down on SU as well

Former President Jacob Zuma abruptly changed the landscape of higher education finance in December 2017, when he announced a massively expanded National Student Financial Aid Scheme (NSFAS). This has meant that South Africans from a family with a combined annual income of R350 000 or less will be receiving adequate financial aid to study without any personal financial contribution, i.e. so-called "fee-free education", which is understood broadly to include the cost of housing, transport, books, food and other living expenses.

While the initial implementation of the expanded NSFAS was inefficient, considerable progress has been made to improve the system through a strengthening of NSFAS leadership as well as considerable assistance from SU's Bursaries and Loans Office. The first cohort of first-year students with access to the expanded NSFAS bursary arrived in 2018, and the amount of NSFAS funding rose sharply as a result. In 2017, SU students received so-called "agent-related financial support" (which included NSFAS funding) to the value of

R298 million; in 2018, this increased to R452 million, largely as a result of the expanded NSFAS scheme.

This is an extraordinary investment in student access by the taxpayer, and SU welcomes the opportunity created by the initiative. However, SU is concerned about the sustainability of the project in light of government's fragile fiscal position.

An additional consequence of the expanded NSFAS scheme is the risk that universities could use the scheme to pass student fee increases on to government. To mitigate this risk, the Department of Higher Education and Training (DHET) has embarked on a project to regulate student fees at a sectoral level. Earlier in 2019, SU obtained an opinion from Advocate Andrew Breytenbach SC that indicated that DHET's attempt to regulate fees would be inconsistent with the Higher Education Act. This leads SU to assume that the proposed fee regulation would be accompanied by an amendment to the act.

Finance Minister Tito Mboweni recently announced severe (19% cumulative) cuts to the budgets of government departments over the medium-term expenditure framework period. At the time of writing, it was not clear to what extent this would affect DHET. Whatever the extent, though, the subsidy unit values that SU receives for the enrolment and graduation of students as well as research outputs will most probably be affected in equal measure. Given these likely constraints on two major income streams (subsidies and fees) for SU's main budget, the Finance Division foresees a very tight budget over the University's planning horizon.

In 2018, Council granted approval for SU's indirect cost recovery rate (ICRR) for all third-stream and fifth-stream revenues to be increased from 17% to 20%, which has already brought some modest relief to the main budget.

3.1.1 Finance Division overview

The Finance Division comprises 147 positions and has an annual budget of R47,7 million. Its mission is:
- to be aligned with SU's institutional objectives and strategic foci;
- to assist all faculties, other professional administrative support services (PASS) divisions and SU as a whole in achieving their strategic goals; and
- to ensure that the operational efficiency of the Division continues to improve.

A schematic representation of Finance's operational composition follows below in Figure 9:
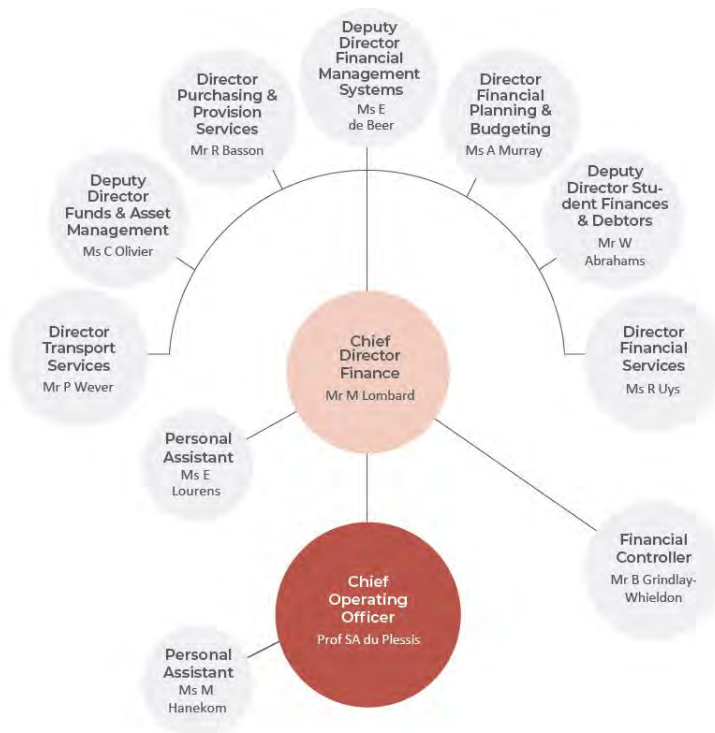
Figure 9: Operational composition of the Finance Division

Finance supports SU's pursuit of its institutional objectives by implementing and maintaining effective business processes and controls, thereby ensuring that all stakeholders receive the required financial services and information.

The Division provides its services to a broad spectrum of stakeholders (clients), including:
- SU Council and relevant subcommittees of Council;
- SU management;
- staff in faculties and other PASS environments;
- students and their parents;
- DHET;
- local government;
- donors and other funders; and
- suppliers.

Finance's clients and their needs form the core of the Division's activities, which include:
- day-to-day financial transactions and management;
- financial planning and budgeting;
- financial reporting;
- procurement services;
- management of student fees and loans;
- financial management of all SU assets, including cash flows; and
- overseeing the Mobility Plan.

The scope of the Division's activities is evident from the following statistics:

Table 1: Finance Division statistics

Item	2014	2018	% increase
Total SU revenue (R'm)	5 140	5 413	+5

Property, books and equipment (R'm carrying value)	4 343	5 357	+23
Investments (R'm), real yield per annum over 18,75 years, 7,5%	6 631	8 792	+33
Active cost centres	13 036	15 431	+18
Kilometres travelled using 309 SU vehicles (R'000)	4 119	4 112	+0

As a PASS division, Finance always strives to deliver excellent support services in line with support service agreements entered into with all faculties. The consistent application of the financial policy and practices ensures accountability in everything they do. The Division is also responsible for developing and managing the institutional budget as well as corporate financial reporting, assisting management to ensure that resources are utilised responsibly and accountably.

Finance promotes a culture of respect and compassion between members of the team, as well as towards clients, both internal and external. The Division liaises closely with the student community, and continuously strives to provide them with an enhanced experience, while still implementing strict rules for the collection of outstanding fees. This includes putting in place various mechanisms for managing and settling student accounts, such as alternative electronic payment platforms, and publishing a document with frequently asked questions, clearly stating payment options and contact details. Finance also works closely with the Bursaries and Loans Office to ensure equity among all SU's students.

The Division continuously evaluates and aligns its objectives and implementation plans with a view to contributing to the implementation of SU's institutional objectives according to the approved Institutional Plan, Vision 2040 and Strategic Framework 2019 – 2024, faculties and PASS divisions' environmental plans, and the needs of other relevant groups, both internal and external.

3.1.2 Progress with Finance goals set previously

Looking back over the reporting period, the Finance Division managed to deliver on the goals set in the previous planning cycle. While most goals span several years, the annual focus is on the refinement, further integration and optimisation of processes. The following paragraphs provide feedback on progress in terms of selected core goals, as provided in the previous year's plan:

3.1.2.1 Planning for and supporting the implementation of SUNFin

In addition to SUNFin, this also includes supporting the larger systems renewal project according to approved information and communications technology (ICT) project goals, but with a special focus on financial integration and the associated internal controls. Among others, this involved a request-for-information process during 2018 to validate the initial decisions regarding the replacement of the financial system.

On 27 November 2018, following a formal request-for-proposal process in terms of SU's tender policy, the Rectorate confirmed the Technology and Information Committee's recommendation of the most suitable service provider for the SUNFin system. SU proceeded to contract Visions Consulting (as implementation partner) and Oracle to implement Oracle ERP Cloud (which will be known as SUNFin) over a two-year period, starting on 9 April 2019. The total implementation cost over the two years is R46,7 million, while the annual licence fees from 2021 onwards will be R4,6 million.

Organisations globally who have implemented ERP cloud solutions such as the one selected for SUNFin describe implementation as on time, within budget and fully functional, but often disappointing post-launch. That is why change management is critical, particularly in an

environment as diverse as SU. We will work hard to ensure that stakeholders in the SUNFin solution are satisfied both during and after implementation through careful planning and execution of the project plan and a focus on managing change.

Similar project governance structures were approved for the execution of the SUNFin and SUNStudent projects (Figure 10). These include the SUNFin steering committee (Figure 11).
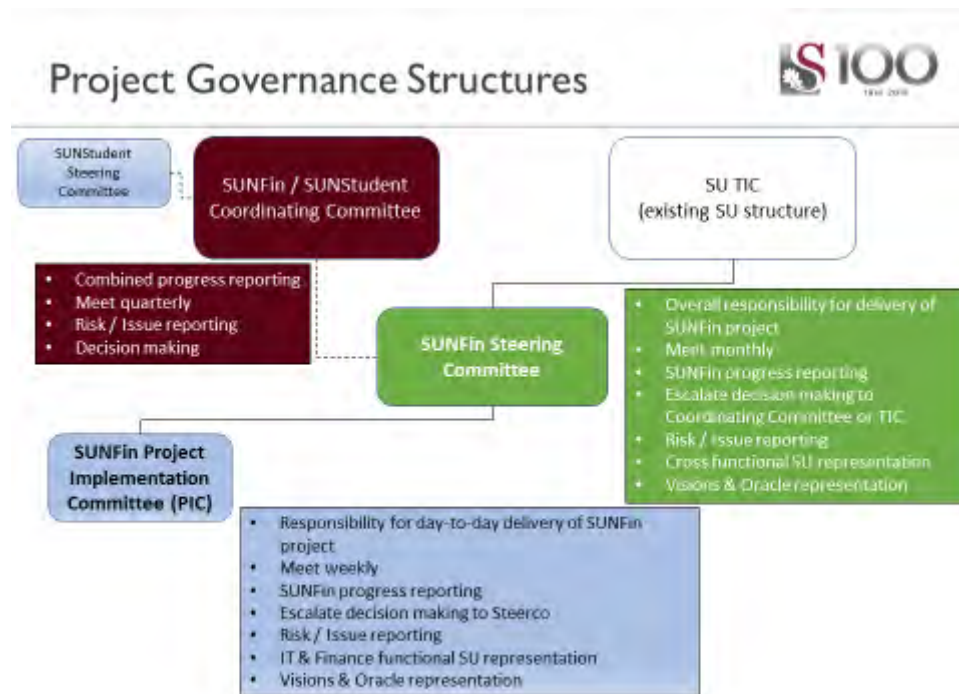

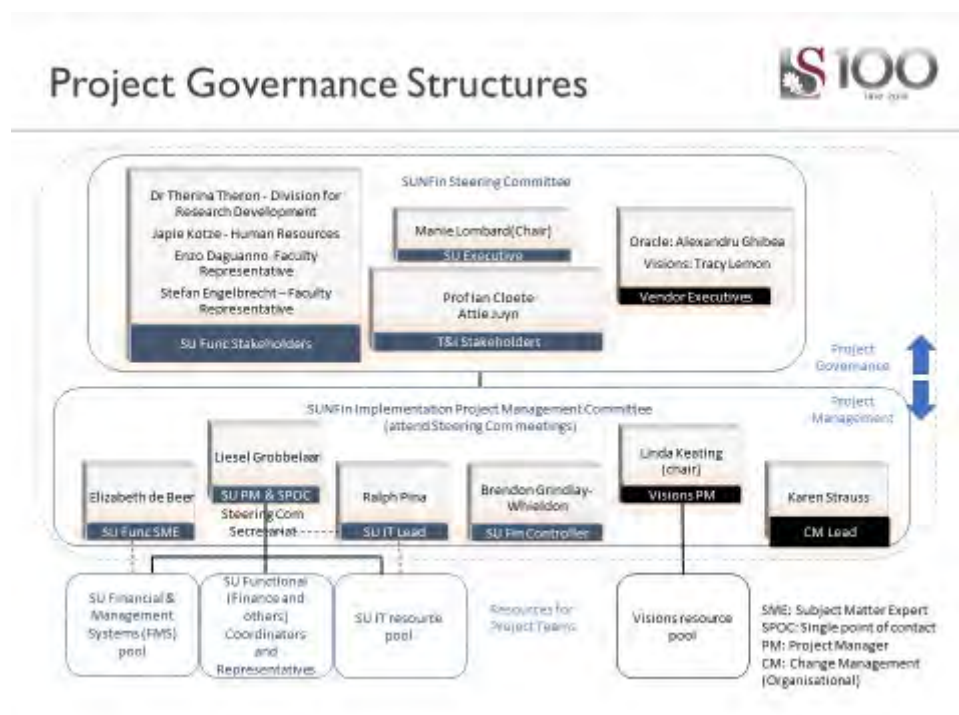*Figure 10*: SUNFin/SUNStudent project governance structures

Figure 11: SUNFin steering committee

Having officially commenced in April 2019, the current status of the SUNFin implementation project is as follows:

- The SUNFin project started on 9 April with ten weeks of cloud process alignment workshops, which offered us a better understanding of the solution and the extent to which current SU processes, policies and possibly also structures would need to change.
- This was followed by preparation for the Iteration 1 build, which at the time of writing was scheduled to be completed by 23 August, with Iteration 1 configuration by Visions starting immediately after that.
- Preparation for Iteration 2 is scheduled for 30 days following completion of the Iteration 1 review. However, timing here will depend on what Iteration 1 reveals.
- The Iteration 2 build is scheduled to start on 4 December 2019, for four weeks.
- The review of Iteration 2 is expected to start in the latter part of January 2020. Keeping in mind that the Finance Division will be occupied by the year-end and annual audit during this time, there is scope for some adjustments to the plan.
- At this stage, user acceptance testing is scheduled to start in April 2020 (after the audit and year-end), although it is proposed that the training of testers and the testing of some business analysts start earlier than April. This will be addressed in more detail when we tweak the plan based on what Iteration 1 revealed.
- The integration build-and-test phase starts after Iteration 1, when the team will have access to an Oracle environment to work in.
- A very deliberate change management methodology has been introduced, and is making good progress.

The key project dependencies and new risks associated with the SUNFin project are as follows:
- Cybersecurity, being a key focus when implementing a cloud solution, is being addressed as part of the identity and access management (IAM) project, which then becomes a key dependency for the SUNFin implementation project.
- The request-for-proposal process for the SUNFin training tool is currently scheduled to conclude by 20 September 2019. This is a dependency for SUNFin timelines, as we plan to include trainers in the Iteration 1 review sessions so as to obtain an understanding of the solution to be able to prepare training materials.
- A decision in principle has been taken on the chart of accounts (COA) segments and structure for Iteration 1. Given the uncertainty in addressing key SU requirements with regard to funds testing and converting balances to budget cost centres, there is a risk of substantial rework following Iteration 1 should the Iteration 1 review identify major changes to the COA.
- The coordination of timelines for various implementation projects across SU, such as integrated reporting, SUNFin, SUNStudent, IAM, Dynamix and Planon, raises the risk that interdependencies between timelines may not be identified and managed proactively. Therefore, a programme journey map and continuous management are required to ensure effective and efficient implementation of all these interdependent projects.
- A decision in principle has been taken to use the ArcGIS data as master data for SUNFin locations. This renders the quality, completeness and accuracy of the data a key dependency for SUNFin.

3.1.2.2 Further refinement of the integrated budget model

The integrated budget model was further refined in terms of all five SU's revenue streams according to the approved SU budget model, with due allowance for the matters investigated by the budget model task team.

3.1.2.3 Further refinement of integrated financial reporting, including reporting to external and internal stakeholders

This also included providing additional financial management information to management, faculties and PASS environments to enable efficient financial planning and management decisions – all in close collaboration with the Division of Information Governance.

In November 2018, SU's 2017 annual report received the Chartered Secretaries Southern Africa (CSSA)/Johannesburg Stock Exchange (JSE) and *Business Day*'s award for the best integrated annual report in the public-sector category. Our integrated reporting process has since been refined even further, as can be seen from the recently released 2018 annual report.

In addition, Information Governance demonstrated the first concept dashboard with financial indicators to the Executive Planning Forum in Franschhoek on 25 July 2019. Information Governance developed the dashboard in collaboration with Finance.

3.1.2.4 Effectively recovering outstanding student fees and loans, and complying with the requirements of the National Credit Act (NCA) 34 of 2005

This included close collaboration with the Bursaries and Loans Office, particularly to manage NSFAS and the additional DHET funding for bursaries.

The Rectorate approved a new, fully NCA-compliant application form on 5 August 2019. Current recovery of outstanding student fees and loans is on track, and the outstanding amounts are reported quarterly to the Finance Committee, Rectorate and Council.

3.1.2.5 Anchoring and further refining the combined assurance plan in collaboration with Internal Audit, Risk Management and other role-players

SU's combined assurance plan is now fully aligned with the SU risk register. The financial controller provides quarterly status and progress reports to the COO, and also reports at every meeting of the Audit and Risk Committee.

3.1.2.6 Executing decisions of the Investment Committee

This particularly related to Investment Committee decisions on the restructuring of SU's long-term investment strategy and mandate, including decisions regarding the funding of the Campus Renewal Project (CRP).

The restructuring of SU's long-term investment strategy and mandate with a focus on specialist international investments has been completed with the assistance of our appointed investment administrator, WillisTowersWatson. This includes the medium-term investment portfolio to manage the funding of the CRP, as well as a new R1 billion long-term portfolio, in respect of which specialist fund managers were selected to improve the growth potential and diversification of SU's portfolio in the long run.

3.1.2.7 Communicating about the new BBBEE code and managing the impact of the new requirements in collaboration with the USAf task team (via the Finance Executive Forum)

The renewal of the BBBEE certification (currently level 8) is still ongoing, as there are additional data requirements regarding bursaries.

3.1.2.8 Implementation of type-2 creditors for diverse payments

This is aimed at effectively reducing the risks associated with current diverse payments, such as possible fraud.

The type-2 creditors were implemented in 2018, and creditors' bank details are now verified as part of the new application process.

3.1.3 New Finance goals for 2019

At a strategic session of Finance divisional heads on 12 February 2019, the following four goals were identified as the top priorities for 2019:

3.1.3.1 Implement SUNFin by January 2021

The main focus of the Division for the next two years will be the roll-out and successful implementation of SUNFin (Oracle Cloud Financials) to support SU's strategic theme 6, "A thriving Stellenbosch University". This will include the refinement of underlying processes and policies to optimise financial procedures, while still maintaining and adhering to corporate governance principles. It will also include reviewing the relevance of all affected sub-systems, as well as digitising current processes and procedures.

The systems renewal project is seen as an opportunity to enhance processes with a view to both good governance and an optimal end-user experience, and to make the financial system an enabler of excellence. Change management and training will also be a major focus to ensure a satisfying experience for our clients.

3.1.3.2 Alignment of structure with best-practice processes and workflows

The implementation of the new financial system will have a direct impact on the staff structure and job roles in the various departments of the Finance Division. The new financial system is role-based, and workflow governs many of the processes. To align our business processes with the best practices offered by the system, we will have to assess the job profiles of all staff as well as what their roles will be in future.

It is also envisaged that a formal Peromnes evaluation of all subdivisions will be carried out by 2020, once the impact of the new system is known. This is in support of SU's strategic themes 5 and 6, namely "Employer of choice" and "A thriving Stellenbosch University". The last evaluations were done in 2011.

3.1.3.3 Further progress with budget renewal

Refinement of the integrated budget model in terms of all five SU's revenue streams according to the approved SU budget model will continue through the work of various task groups. This too is in support of SU's strategic theme 6, "A thriving Stellenbosch University". Major focuses in the short term will be the development of:
- a framework for student fees in view of the possible regulation of fees;
- a rental model for SU facilities, including a policy to govern processes;
- a budget model for type-3 centres (with a focus on the School for Data Science and Computational Thinking); and
- a budget model for hybrid learning.

3.1.3.4 Roll-out and implementation of the Anti-Corruption & Anti-Bribery Policy

Once approved by the Audit and Risk Committee, the Finance Division with the assistance of Legal Services will ensure the successful roll-out and monitoring of the Anti-Corruption & Anti-Bribery Policy, also in support of strategic theme 6, "A thriving Stellenbosch University".

3.2 Focus on good governance

In addition to the Finance Division's many initiatives above, systemic sustainability is further supported by the continuous pursuit of improved governance. To this end, the University implements the recommendations of the King IV Code of Good Governance and adheres to the reporting standards required of all South African higher education institutions.

SU's roll-out of a sustainable sourcing model with respect to services such as security, catering and cleaning is a good example of the value added in terms of good governance in this RC.

3.2.1 Risk management

In line with the refined concept of combined assurance concept in King IV, SU has adopted a fully articulated combined assurance model as a governance approach to risk management. The Risk Management Policy approved in November 2015 and the subsequent Risk Management Framework and Plan approved by Council's Audit and Risk Committee (ARC) on 17 October 2016 form the basis of SU's combined assurance plan. The combined assurance plan was developed in collaboration with internal auditors Deloitte and other role-players, and served before the ARC on 18 May 2017. The roles of the five lines of defence[1] recommended by King IV have since been clearly identified and implemented.

Though the approach to risk management is embedded in all the RCs and faculties, the RC: Operations and Finance manages the overarching framework. Since 2017, SU's risk management processes have been revised and further refined with the assistance of Deloitte. The principles for setting risk appetite were discussed at the additional ARC meeting scheduled to focus primarily on risk management matters in November 2017.

While colleagues in the Finance Division, especially the financial controller, take the lead in terms of combined assurance, the Risk Management Framework is managed by the Director: Risk Management and Campus Security in the Facilities Management Division.

3.2.2 Safety and security

The 2018 security report provided information on 2018 crime trends, the management of perceptions regarding personal safety and security, the outcome of the procurement process to appoint a new professional security services provider, and the state of security on SU's satellite campuses.

The following sections report on:
• current security trends;
• the state of security on SU's satellite campuses;
• the outcome of recent security risk assessments;

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[1] The five lines of defence in the combined assurance model are (i) managing assurance (management), (ii) oversight assurance (Risk Management Committee, etc.), (iii) independent assurance (internal audit, tip-off line, specialist, etc.), (iv) external audit assurance (external audit) and (v) oversight assurance providers (Council, Senate, etc.).

- the management of events security risks; and
- the future utilisation of advanced security technologies.

3.2.2.1 Security trends

The general crime trend has shown a gradual downward curve since mid-2018. This was due to both internal and external factors. The internal factors include continuous assessment and mitigation of security risks, the procurement and appointment of a new security services partner, an increase in the number of security officers on patrol, utilisation of improved communication security systems, and the prioritisation of support and training for security staff to maintain high morale. While these have contributed to the current all-time low crime statistics, Campus Security staff are fully aware of the reality that external factors could easily destabilise the situation.

Figures 12 and 13 show the total annual reported crime-related incidents and the breakdown by quarter, in both instances for the period 2005 to date.
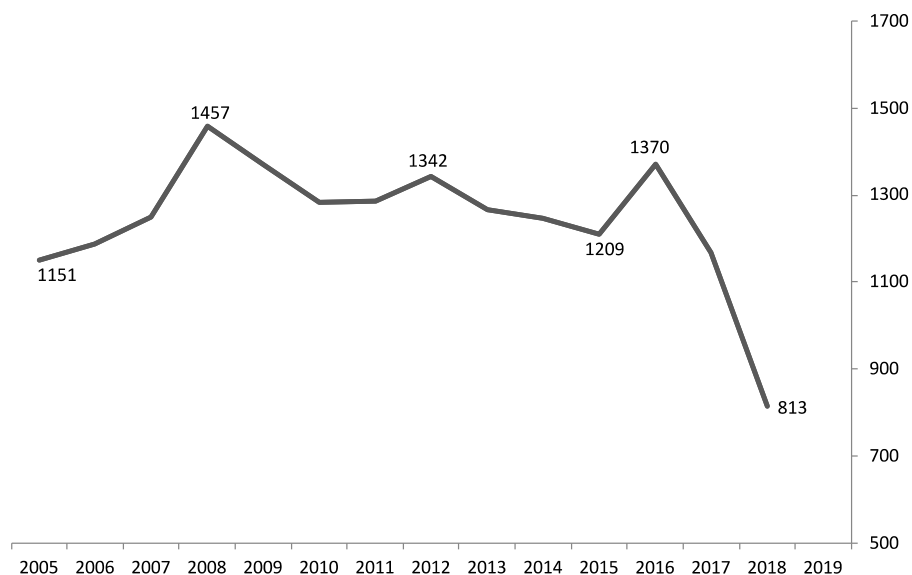

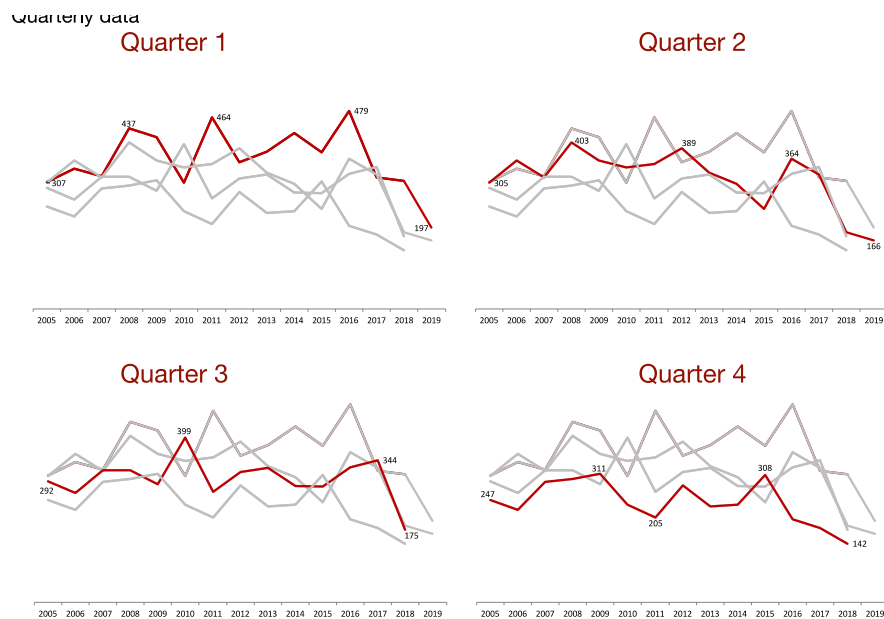*Figure 12: Total annual reported crime-related incidents*

Quarterly data

Quarter 1

Quarter 2

Quarter 3

Quarter 4

Figure 13: Reported crime-related incidents by quarter

3.2.2.2 Security on SU's satellite campuses

Tygerberg: While the recently upgraded perimeter fence and refined access control measures at Tygerberg campus have had a positive effect, the openness of the campus due to the large number of day visitors and contractors accessing the grounds is currently a major concern. The two key events affecting campus safety and security are the construction of the new Biological Medical Research Institute (BMRI) on campus and the unstable environment at neighbouring Tygerberg Hospital, with gang-related violence often spreading from the surrounding suburbs to the hospital. It is foreseen that campus security and access control will come under even more pressure when construction on the new hospital starts and large numbers of workers may want to cross the campus, being the shortest route from the station. Steps have been put in place to mitigate these risks, but the residual risk remains very high.

Bellville Park: The completion of the new fence around the campus has significantly contributed to the safety and security of staff, students and visitors. However, the vast tract of vacant land surrounding the campus continues to appeal to the homeless community, who attempt to set up structures there. Campus Security contracted a professional security service provider to patrol the area on horseback. This intervention has proved most effective and will be maintained, as it is extremely challenging to move people or communities once settled.

Worcester: Very few security incidents were experienced on Worcester campus during the reporting period. The major concern at Worcester is the safety of students while doing fieldwork in high-risk areas. The Faculty of Medicine and Health Sciences provides safe transport and coaching to students, while Campus Security, via our contracted service provider at Worcester, supports efficient emergency response services. The campus has strong relations with the local police, and a mobile application will be launched shortly that will provide students and staff with timeous information about security risks in the areas where they work.

3.2.2.3 Security risk assessment outcomes

Campus Security has conducted annual residual exposure risk assessments since 2015. The outcomes of the risk assessments are driving, rather than cost-driving, security capacity. This is one of the major internal factors contributing to the current all-time low crime statistics.

In 2016, security patrols were expanded in key risk areas such as the Study Centre and the Rooiplein (Stellenbosch) as well as along routes connecting Stellenbosch, Tygerberg and Worcester campuses with their respective central business districts. This means that security staff also patrol key risk areas outside the central campus, such as the pedestrian route under the bridge at the main entrance to Tygerberg. The contracted service provider at Worcester campus delivers an armed response service via panic buttons to students using pedestrian routes from Worcester campus to the central business district.

During 2018, a comprehensive risk assessment highlighted the areas between Stellenbosch and Tygerberg residences as a residual risk, particularly at night. As a result, 25 additional guards were deployed in these areas, which have contributed to the current low crime trends experienced here.

At present and towards mid-2020, the focus of security expansions will be on the northern end of Stellenbosch campus. The Food Sciences building, Lentelus sports grounds and the area where Facilities Management, Information Technology and the new decanting building are situated will derive benefit from enhanced security patrols.

3.2.2.4 Management of events security risk

The safety and security of participants and spectators attending large events are stringently regulated by the Safety at Sports and Recreational Events Act 2 of 2010, as amended. The increasing number of events hosted on SU premises, and the safety management responsibility placed on SU as "owner" of the land and facilities, caused growing concern about the identification, assessment and management of risks at large events. In this regard, Campus Security plays a dual role, being the institutional custodian of the risk and safeguarding process, while also providing or overseeing security services. Due to the conflict of interest this sometimes presents, the position of events safety risk manager was established and filled to guide and oversee events organisers towards legal compliance.

3.2.2.5 Future utilisation of security technologies

While SU is incrementally reaping the benefit of its growing access control and closed-circuit television (CCTV) systems, security technologies continue to evolve. Facilities Management, Campus Security and Information Technology are currently exploring the possibility of using facial recognition technology for access control, and integrating various security systems at suitable venues. An exploratory project is currently under way. Once successfully completed, this will indicate the way forward for campus access control via advanced technology such as facial or skull recognition embedded within existing and future camera systems. This technology will form part of a digitalisation strategy for Facilities Management.

3.2.3 Good corporate governance

While the evolving business continuity plan is designed to maintain existing SU business, the University is also expanding the scope of its activities in the commercial sphere, which poses additional, often different governance questions. Clustered together, the income generated from these commercial activities is known as the fifth income stream.

3.2.3.1 SU's platform for the fifth income stream

Innovus serves as SU's platform for the fifth income stream generated through the commercialisation of the University's assets. The key rationale behind a comprehensive, optimal strategy for fifth-stream (technology transfer and commercialisation) income is the need for the University to reduce its reliance on the first (state subsidy) and second (student fees) income streams, which are no longer sustainable. The fifth stream is also required to supplement the third (research contracts) and fourth (philanthropic donations) streams. This is achieved through the several divisions of Innovus.

Innovus Technology Transfer

Innovus Technology Transfer is responsible for SU's intellectual property and trademark portfolio. SU researchers, staff and students who want to leverage the commercial potential of their expertise and research are supported throughout the entire technology and knowledge transfer process to generate benefits for the University as well as society. This function includes intellectual property (IP) management through, for example, patenting, licensing and the formation of spin-out companies.

Technology transfer activities deliver value to SU by:
- educating staff and students on IP and entrepreneurship;
- protecting and managing IP in accordance with the Intellectual Property Rights from Publicly Financed Research and Development Act 51 of 2008;
- supporting technology and product development, and the commercialisation of inventions;
- licensing patented technologies;
- conducting direct product sales;
- creating and supporting spin-out companies;
- attracting investment to spin-out companies;
- managing and growing SU's stake in its group of companies;
- managing risks associated with commercialisation, and proactively protecting SU against such risks; and
- generating an income for SU (both now and into the future).

The impact of technology transfer activities is growing – both in industry, who is increasingly taking up new technologies (through licensing agreements and the formation of new companies) that generate new products and processes, and in our local economy and community. By broadening access to our research outputs and innovation, these activities brand SU as a relevant university that delivers excellent research outputs making a difference in our world.

We have received 22 interesting new invention disclosures this year to date. These include:
- a "skin printer";
- fractioning, i.e. the process of turning insects into food;
- a method for sound-based differential diagnosis of lung disease;
- a natural gas storage system;
- concentrating solar power (CSP) unmanned aerial vehicle (UAV) calibration services;
- a bio-compostable wine bottle;
- a portable urodynamic system (PUDS);
- a technique to quantify cilia function with radio-opaque polymer beads; and
- a SUNguis laboratory, which provides specialised blood biomarker analysis for inflammation, hypercoagulability and a leaky gut.

<u>University Technology Fund</u>

In June 2019, Council approved R20 million co-funding for the establishment of the University Technology Fund (UTF), which is backed by the SA SME Fund.[2] SA SME has since concluded their due diligence checks of both Innovus and UCT's technology transfer office – the initial participating institutions. Their next steps are to identify and complete a due diligence on a fund manager, and to present the UTF to their investment committee. At the time of writing, however, the SA SME team seemed confident that the fund would be up and running soon. In addition, Mr Ketso Gordhan, CEO of SA SME, is already negotiating further investment in the fund from other sources to ensure that more universities will be brought on board.

Independent from the SA SME activities, although with their approval, the COO has also entered into, and made significant progress with, discussions with Naspers regarding their possible involvement in the UTF. Naspers is very keen to make a significant investment in the fund (with a first instalment of R250 million), for a number of strategic reasons. Yet this does pose the challenge that the internet and media giant may then want to control the fund. They have appointed a consultant to assist them with their internal processes and decision-making in this regard.

<u>Innovus Pty (Ltd)</u>

Through its holding company, Innovus Pty (Ltd), Innovus also manages the University's group of companies. In this regard, the Nedbank Stellenbosch University LaunchLab, a proud initiative of Innovus, is a game changer. Through the LaunchLab, entrepreneurs from both inside and outside SU are supported. The business incubator has helped establish SU as an internationally acclaimed entrepreneurial university: In the international 2017/18 UBI world benchmark study of university-linked incubators, the LaunchLab stood out among its peers.

Innovus Pty (Ltd) has an experienced board comprising business leaders as well as senior members of the University's management and Council members. The board assists with the governance of the SU's subsidiary and affiliate companies, as well as the commercial ventures managed by SUNCOM.

Two of the companies incorporated in 2018 – CubeSpace and GeoSmart – declared dividends this year. Innovus anticipates that at least five companies will pay dividends to their shareholders this year. A brief overview of some of the Innovus company success stories follows below:

(i)   Solar energy company **GeoSUN Africa** is expanding its services into new regions, with potential projects being pursued in Malaysia and Brazil. The company is at the cutting edge of bi-facial photovoltaic modules, the latest trend in the solar industry. These are solar panels that can receive sunlight from both the front and the rear, while the rear can generate an additional 5–20% of electricity, depending on the reflectivity of the soil.

(ii)   **SUN Magnetics'** sales growth remains strong, and Microsoft is the latest large corporate that has bought five professional InductEx[3] licences for their quantum computing development project. The Massachusetts Institute of Technology's Lincoln

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[2] SA SME is a fund of funds created in 2016 by big business to support entrepreneurs and help established small firms expand. It has set out to establish a R150 million university technology fund to support the commercialisation of IP developed at South Africa's tertiary institutions.

[3] InductEx is a three-dimensional magnetoquasistatic inductance calculator for multi-terminal superconductive integrated circuit layouts. It is available as a console application for Windows, Linux and Mac OS X.

Laboratories have also expanded their licence take-up from one to three professional licences.

(iii)   The patented **Custos** video watermarks seem to be the talk of Tinseltown, with Hollywood studios recommending the technology to one another, and Turner and Disney currently running tests on it. From feedback received, the Custos watermark is the only technology currently available that can robustly protect specific types of videos – a benefit that will be fully leveraged to effect sales to these global companies.

Gert-Jan van Rooyen, Custos chief executive, spent three months in Los Angeles and Atlanta working on these and other sales. His visit culminated in a highly successful National Association of Broadcasters conference, and a partnership with the Atlanta-based PreSoft as a local sales agent. Custos is now finalising the negotiations and products for various leads that have emanated from Van Rooyen's trip.

Locally, Custos was approached by SU to help protect the University's educational content, which is being resold on external platforms for commercial gain. A solution is now being deployed and Custos has started marketing it to other universities globally. Already, the Georgia State Chamber of Commerce has indicated interest in facilitating a meeting with the heads of the state universities to market this product to them.

Custos is finding document protection a highly attractive market. In partnership with Deloitte, it has built a platform to use its patented blockchain technology to securely distribute board packs for large enterprises. In the future, Custos also plans on co-developing blanket solutions for document distribution for enterprise clients. For now, though, the board pack product is their minimum viable product in this market.

On the back of these successes, Custos has secured R8,7 million in convertible funds. The funders include a venture capital firm based in the United States and Kenya (Zephyr Acorn), an American angel investor (who is currently a professor of entrepreneurship at Carnegie Mellon University), one of their previous investors, as well as the UTF. Being the UTF's first investment, Custos is regarded as a poster child for university spin-outs. The company is excited to be the pioneer for this fund, which is viewed as one of the biggest initiatives in South African innovation to date. Custos is currently raising a further R15 million to enable it to go global with its document protection product and to develop their technology for live video watermarking, in which some of the largest sporting events globally have already indicated interest.

(iv)   The film-scoring and music recording studio **SEIN Media** is proud to report a successful first year in business. The enterprise has experienced organic growth, and 14 of its productions have received international film festival accolades, including being an official selection at the Cannes Film Festival.

(v)   **CubeSpace's** revenue grew by 153% for the 2019 financial year. A single client of this aerospace company accounted for approximately 45% of its 2019 revenue.

To keep up with growth in both staff complement and production demand, CubeSpace moved to new facilities. A five-year lease was signed with SU for an empty warehouse located near the LaunchLab. The effective floor area has since been nearly doubled by installing a steel mezzanine second storey, and putting up dry-walling to create rooms. A new cleanroom[4] about four times the size of the old one has been built, as well as a

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[4] A laboratory facility designed to maintain extremely low levels of particulates, such as dust, airborne organisms or vaporised particles, for use as part of specialised industrial production or scientific research.

new dark optics calibration cleanroom. Despite these enhancements, however, CubeSpace is running at full capacity to keep up with the current order book.

(vi)   The **Stellenbosch Nanofiber Company's (SNC)** foray into the cosmetics field continues to show promise. The main activities to establish SNC in this space are (a) setting up a formal joint venture company with Taiki USA; (b) developing a large-scale spinning machine for commercial manufacture of nanofiber-based cosmetic products in the United States; and (c) developing and selling a range of cosmetic products that demonstrate the potential of nanofibers in this space. Significant progress has been made in these three areas over the past few months.

(vii) **GeoSmart Space**, a geological research company, started operating in September 2018 and, thanks to a number of sales at the end of 2018 and in early 2019 (mainly of DEMSA2),[5] was in the fortunate position to declare its first dividends in February 2019. Most of the sales were made to the renewable-energy, mining and engineering industries. Since then, the focus has been on developing new techniques to improve the quality of the DEMSA2 product. Some work has also been done on generating value-added products from DEMSA2, such as a digital terrain model, of which the first sale was realised in March 2019. The company has also been involved in a flagship research project on the impact of climate change on the wine industry. The project is funded by Winetech and carried out by SU's Centre for Geographical Analysis (CGA).

(viii) Virtual reality (VR) software company **AxioVR** has made great progress expanding their services to various clients. In addition, Dr Stéfan du Plessis, research director and co-founder, attended an international conference in Orlando, Florida, in April 2019, where he discussed opportunities for research on the use of VR in stress and anxiety research and therapy with his international peers. Dr Du Plessis has also been invited to submit a VR symposium for the Schizophrenia International Research Society, where international researchers working in the field of VR and schizophrenia will present talks. This will be a potential opportunity to showcase AxioVR's capabilities to an international research audience.

(ix) In February 2019, **SharkSafe** completed their first test deployment of 200 SharkSafe Barrier[6] units in Réunion Island. The company was contracted by the island's Shark Risk Management Centre to install a 180 m² barrier to test its efficiency in deterring the local bull shark from the surface zone. To date, no sharks have passed through the barrier, and it has also survived rough sea conditions. Should this test installation prove effective in keeping sharks out of the area, it may lead to a full commercial installation off the coast of Réunion. The company also recently received request for quotations from Florida, Dubai, Australia and Saudi Arabia.

SharkSafe is currently conducting further engineering tests to improve the barrier's performance in shallow waters as well as deep-sea anchorage. The tests are being done in a laboratory through in-door wave simulators. The entity is actively seeking funding to conduct final testing in real sea conditions.

(x)   The Department of Health has approved the roll-out of **SurgiTrack**, a digital surgical workflow system, at Tygerberg Hospital for three to six months. The developer is also negotiating with CompuGroup Medical South Africa to sign a potential licence for the

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[5] A digital elevation model of South Africa at 2 m resolution.
[6] An eco-friendly technology that combines visual and magnetic stimuli to deter sharks.

use of the SurgiTrack software in their current system. Discussions with Ingress Medical Practices on a possible joint venture are also ongoing.

(xi)   Finally, Innovus received an offer for its 10% shareholding in **SUNMeDIA** Bloemfontein at a fair valuation.

SUNCOM

SUNCOM is SU's commercialisation arm for mostly non-IP-related outputs. The entity manages and commercialises most non-IP and non-research business opportunities at SU, whether through a separate internal business unit or a spin-out company. These business opportunities comprise activities where a specified fee or tariff is charged for the provision of products, services or access to and use of facilities, whether in the short or long term. Profits are invested in new projects, SU's central budget, or the environments where the commercialisation activity originated. SUNCOM provides SU, its students and staff as well as the public and other organisations with comprehensive support in a cost-effective way. Marketing and/or customised services can be rendered to both internal and external clients at variable rates.

SUNCOM is responsible for the following operational divisions:
- On-campus student accommodation services
- Off-campus accredited student accommodation
- Letting of SU facilities for commercial use (off-peak)
- The Langenhoven Student Centre (Neelsie)
- Providing accommodation to, among others, visiting academics
- Copy and print services
- The Matie Shop and other SU stores
- The Botanical Garden
- Campus coffee shops and/or cafés and tuck shops
- Campus food and catering services

SUNCOM delivers value to SU by:
- expanding the academic offering on a cost-effective basis;
- reducing dependence on budget allocations;
- optimising the fifth income stream;
- increasing long-term financial sustainability; and
- promoting the SU brand.

SUNCOM aims to achieve optimal market value for SU products and services, on a full-cost basis internally, and profit-driven externally. It also works closely with Innovus and the Division of Corporate Communication to ensure that SU's trademarks are protected and commercialised.

The academic project always gets priority, with commercialisation initiatives serving as secondary support to SU's academic ideals. As such, SUNCOM supports academic and research outputs, provides continuity and effective cost savings for SU, and generates additional income for the University.

Important SUNCOM projects over the reporting period included the following:

(i)   A comprehensive upgrade of Helshoogte residence has commenced, and should be completed by mid-2020. The completion cost is estimated to be R80 million. A smaller upgrade of Hippocrates residence on Tygerberg campus is also being carried out, which is estimated to cost approximately R10 million upon completion.

(ii)   The Goldfields dining facility project, at a cost of approximately R20 million, has been completed. The new facility has a seating capacity of 350, although the kitchen can cater for double the number. The old kitchen equipment is also being upgraded, after which an overhaul of the Dagbreek kitchen will commence.

(iii)   SUNCOM is working hard on improving client service in the Matie shops (including the copy and printing services), residences and the Neelsie.

(iv)   The trial Conference and Event Support Unit has shown great potential, and SUNCOM is planning on formalising it.

(v)   The short-term rental of SU facilities will still require some work in terms of change management at the University.

(vi)   In terms of Maties Milk, the competitive nature of the raw milk industry, combined with external factors (from the dairy's perspective) such as minimum prescribed SU wage levels, a lack of grazing and an inability to scale, resulted in continued losses. This ultimately led to the decision by the Innovus board to close the dairy. Subsequent to the board decision in April 2019, a process was put in place to wind down operations and retrench the staff.

Retrenchment procedures in the milking parlour were initiated in conjunction with SU's Human Resources Division, and employees were given three months' notice. This division of Maties Milk closed on 31 May, and the herd was sold and removed from Welgevallen in early June. Retrenchment procedures in the processing, sales and distribution divisions of Maties Milk were also initiated. These operations ceased on 31 July.

Short Courses and Copyright

Also falling under Innovus, this Division takes charge of all short-courses and copyright matters of the University.

The Short-Courses Office was established with the aim of coordinating, standardising and supporting short-course processes on behalf of SU. Short courses as a teaching activity are presented in the name of SU, and therefore need to comply with the University's quality assurance requirements as well as the prescripts of the relevant government and regulatory institutions – something the Office ensures.

The short-course offering strengthens SU's knowledge transfer structure and encourages entrepreneurship and innovation among the University's staff. It also broadens the diversity of the institution's student profile, promotes flexibility in learning, and accommodates market demands and trends by providing further education and continued professional development opportunities.

In 2019, the total income generated by the SU short-course offering (which no longer includes income from SU conferences and events) was R25 628 312 (year to date, excluding income from the short courses of University of Stellenbosch Business School Executive Development (USB-ED)). A total of 325 registered and approved short courses were presented over this period, of which 89 were USB-ED offerings. These figures are slightly lower than for the corresponding period last year. The student management system used for short courses recorded 10 268 short-course participant registrations for 2019 (year to date), including 3 978 participants for USB-ED. These numbers, in turn, are higher than in 2018.

The first five months of 2019 were almost entirely taken up by the development, testing and production of SU's short-course online project. The project, SUNOnline, finally went live on 2 May. Unfortunately, a new workspace application interface, the approval and recommendation workflows as well as e-mail integration, all which seemed to be working in the testing and production environments, subsequently caused unpredicted and unexpected major functionality issues.

Obviously, this also frustrated end users (both staff and participants) and resulted in a fair amount of user animosity towards the system changes. After six weeks of intensive investigation, re-mapping and technical structure adjustments to systems and integration, the IT Division managed to address and resolve most of the issues. The systems and processes are now being fully implemented and carefully monitored by both IT and the Short Courses Office. It seems the full impact and success of SUNOnline will only be measurable once the systems have been fully operational for at least an entire academic year (i.e. by the end of 2020).

In terms of the activities of the Division's Copyright Office, the blanket licensing agreement concluded between SU and DALRO (Dramatic, Artistic and Literary Rights Organisation) is still being successfully implemented, managed and administrated on all four SU campuses. This is being done in strict compliance with the provisions of the current Copyright Act 98 of 1978.

4. THE OPERATIONAL NETWORK FOR A LARGE PUBLIC UNIVERSITY

The RC: Operations and Finance is responsible for crucial networks that enable the University to operate. These networks span all SU campuses and range from human (sport), to technological (IT), to physical (facilities).

4.1 Excellence in sport

Sport has always been a unifying social mechanism and has strategic value for SU. In the reporting year, Maties Sport has realigned its strategic goals to coincide with SU's six new core strategic themes, as Figure 14 shows:

SU STRATEGIC THEMES	ALIGNMENT	8 MATIES SPORT STRATEGIC GOALS
Transformative Student Experience	1, 3, 2, 7 ,8	1. Expand the academic footprint and explore the presentation of a differentiated academic offering.
Networked & Collaborative Learning	1	2. Achieve a dominant position within focus sports at tertiary, regional and national level.
Research for Impact	1	3. Develop world-class sportsmen and women.
Purposeful Partnerships and Inclusive Networks	1, 3, 4	4. Deliver an excellent university sport experience. 5. Increase participation in recreational sport.
Employer of Choice	5, 6, 7	6. Build social capital. 7. Increase SU diversity profile
A Thriving Stellenbosch University	2, 3, 4, 5, 6, 7, 8	8. Increase percentage of competitive sportsmen and women who achieve academic success

Figure 14: *Alignment between Maties Sport goals and SU's core strategic themes*

In July 2019, SU was the proud host of the 2019 USSA (University Sports South Africa) Games. Figure 15 summarises the participation and results of SU's athletes at this annual highlight on the university sports calendar.
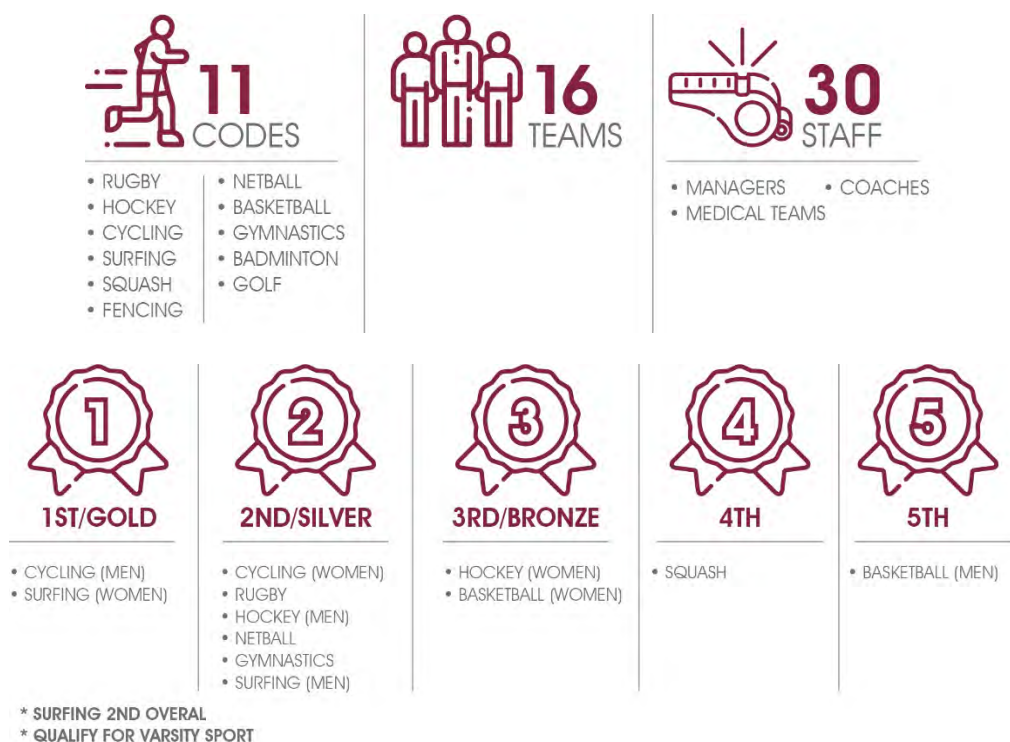

11 CODES
- RUGBY
- HOCKEY
- CYCLING
- SURFING
- SQUASH
- FENCING
- NETBALL
- BASKETBALL
- GYMNASTICS
- BADMINTON
- GOLF

16 TEAMS

30 STAFF
- MANAGERS
- MEDICAL TEAMS
- COACHES

1ST/GOLD
- CYCLING (MEN)
- SURFING (WOMEN)

2ND/SILVER
- CYCLING (WOMEN)
- RUGBY
- HOCKEY (MEN)
- NETBALL
- GYMNASTICS
- SURFING (MEN)

3RD/BRONZE
- HOCKEY (WOMEN)
- BASKETBALL (WOMEN)

4TH
- SQUASH

5TH
- BASKETBALL (MEN)

* SURFING 2ND OVERAL
* QUALIFY FOR VARSITY SPORT

Figure 15: *Maties Sport participation in and results at USSA 2019*

4.1.1 Maties Sport operational units

4.1.1.1 High-Performance (HP) Unit

The Maties HP programme consists of the three categories of performance management, performance enhancement and athlete empowerment. The programme is focused on the player as both a sportsperson and a student. At its heart, it is about attracting and retaining top athletes and coaches in an inclusive, holistic and elite training environment that offers them the opportunity to achieve at national and international levels.

The HP Unit's strategy has been to make SU a sustainable feeder institution of at least 20–30% of athletes competing in recognised competitions such as the Commonwealth Games, Olympics, Paralympics, World Student Games and World Championships for the respective sporting codes. In addition, a major focus of the Unit remains the holistic success of student athletes, which is facilitated through the PACER programme. The programme empowers student athletes to be active agents in their own sports careers, academic studies and personal development.

Another goal has been to create one or more sport centres of excellence in collaboration with an external partner and/or a sport federation. In this regard, Maties Sport has concluded additional memorandums of understanding (MOUs) with Swimming South Africa and the Stellenbosch Academy of Sport. The Division is also in the process of concluding a memorandum of agreement (MOA) with Paul Roos Gymnasium for the establishment of an Indoor Cricket Centre.

With regard to 2019, the five main objectives of the HP Unit are to:
- focus on athletics, football and rugby student athletes to increase their academic pass rates;
- increase PACER participation to 100% for rugby, swimming and football;
- increase the diversity of HP Unit participation to 45% from the black African, coloured, Indian and Asian (BCIA) population groups;
- identify three student athletes to progress to postgraduate studies; and
- achieve and retain top three positions for all sporting codes (at the USSA, Varsity Cup and Varsity Sport meets).

In the 2018 academic year, Maties Sport HP student athletes achieved a first-year throughput rate of 85%, which is in line with the SU average, despite these students' onerous time commitments. Maties Sport is particularly proud of its student athletes who continue on to postgraduate programmes following their undergraduate studies. A total of 50 student athletes graduated in 2018, of whom 31 enrolled for postgraduate programmes in 2019.

A dynamic approach to programme evaluation and development has been implemented to facilitate effective intervention in three main areas of HP students' lives, namely their academic performance, their holistic personal well-being and HP development, and community awareness and interaction.

A PACER mid-year assessment of all HP student athletes' academic results, revealed that 49 (20%) of the 245 students had been unsuccessful in 33% or more of the modules they required to pass. These students are currently undergoing individual performance lifestyle assessments and coaching to identify interventions to support their academic performance.

Maties Sport's representation of BCIA student athletes has grown steadily over the past three years. This is largely due to the new approach to bursary allocations, as well as the requirements of the national university competitions. While the goal of 45% has not yet been

reached, it will be achieved in the coming year as each of the HP sporting codes implement their three-year strategic recruitment and retention plans drafted following the implementation of the bursary calculator.

Figures 16 and 17 show the progress with diversity in terms of gender and race in the HP programme.
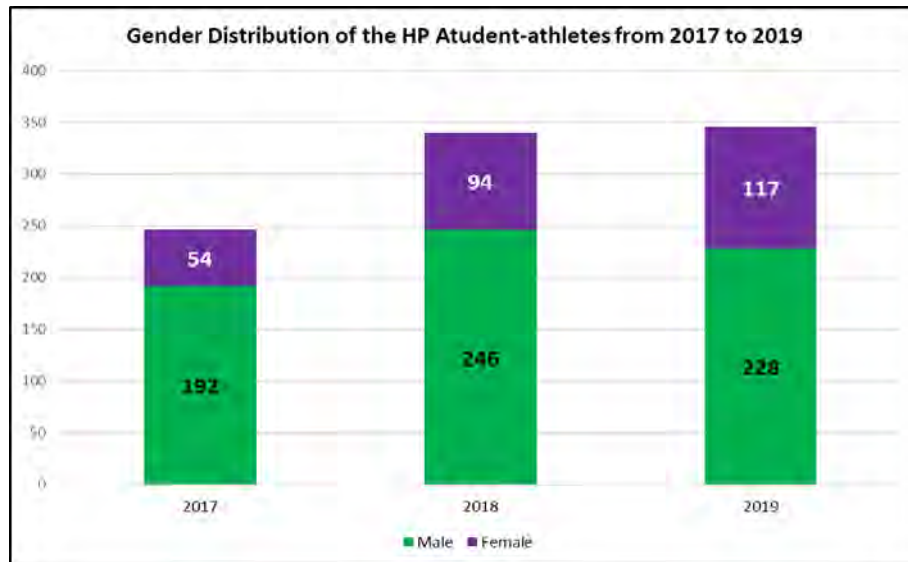

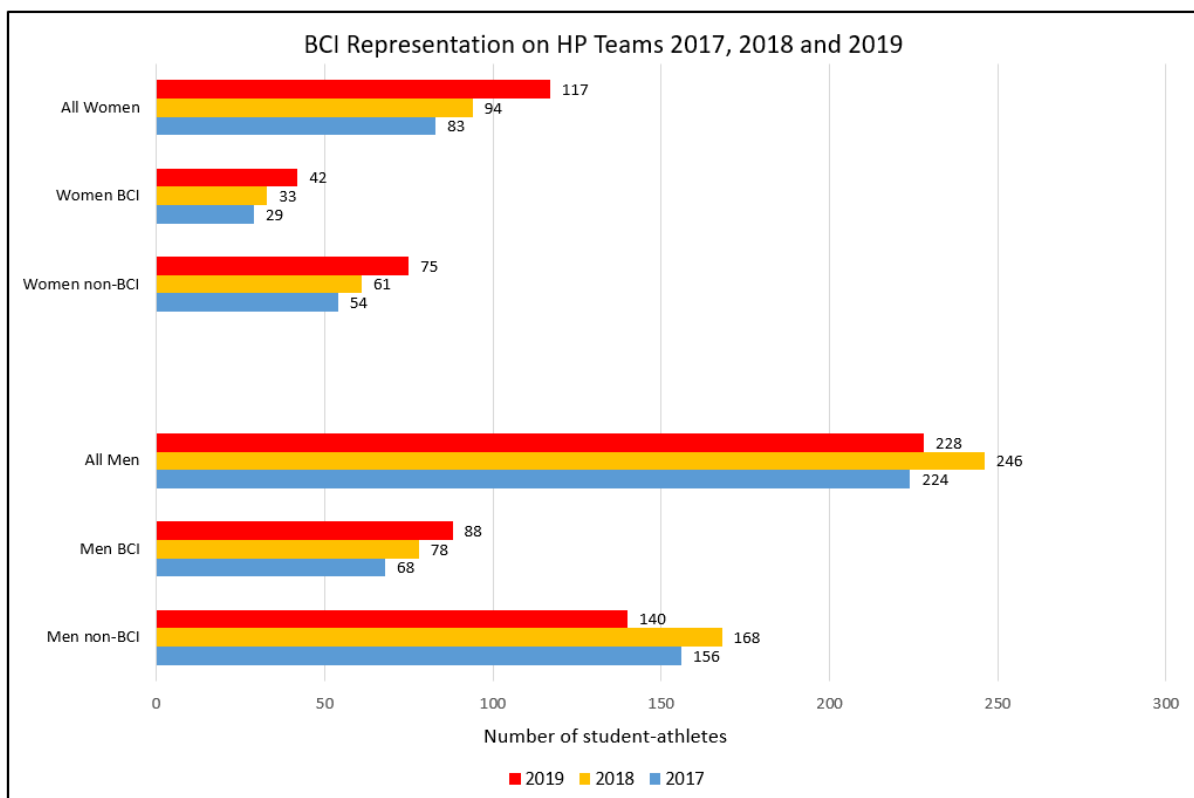**Figure 16:** *Gender distribution of Maties Sport HP student athletes*

Figure 17: *Racial distribution of Maties Sport HP student athletes*

4.1.1.2 Centre for Sport Leadership

The year 2019 saw the incorporation of the former Centre for Human Performance Sciences (CHPS) – an interdisciplinary centre with a focus on sport – into Maties Sport as the Centre

for Sport Leadership. This was the result of close historical collaboration between CHPS and Maties Sport, and Maties Sport's desire to contribute to the broader sport leadership space. The Centre now functions as the key mechanism through which Maties Sport pursues one of its eight objectives contained in the 2014 Institutional Sport Plan, namely the expansion of the academic footprint of sport. CHPS activities span two dimensions: leadership development for student athletes, coaches and administrators, as well as thought leadership on key issues in South African sport through interdisciplinary research opportunities.

The Centre is also responsible for curating Maties Sport's international partnerships and providing strategic direction for social impact initiatives.

In terms of internationalisation, the following were noteworthy events in the reporting period:

- Chief Director Ilhaam Groenewald attended the 2019 Global Sport Summit at Arizona State University's Global Sport Institute (GSI) in March. Maties Sport's existing partnership with the GSI continues to grow, and will see a reciprocal visit to Stellenbosch by GSI colleagues in September. This forms part of a sport symposium to be hosted by the Centre for Sport Leadership, as well as a workshop for Maties Sport coaches facilitated by GSI colleagues.
- An existing Erasmus+ partnership with the University of Limerick in Ireland saw Grant van Velden, Maties Sport's manager of sport technology and training innovations, being hosted in Limerick in June. The objective was to share knowledge in the sport technology domain, and further expand the relationship.
- In August, the Centre hosted visiting student athletes and administrators from the University of Richmond, United States, as part of a half-day visit to Maties Sport. The visitors were treated to an "HP experience" as a sample of the training approach followed by the HP Unit.

With regard to social impact in the period under review, the Centre hosted Fulbright fellow Dr Carrie LeCrom from Virginia Commonwealth University, United States. Dr LeCrom's primary research interest is sport for social change. She is currently conducting a girls' leadership development project at Stellenzicht Secondary School in Jamestown with football as the primary tool of delivery.

4.1.1.3 Recreation and Active Lifestyle Unit (RALU)

The Recreation and Active Lifestyle Unit goes beyond the scope of HP student athletes to include the broader student community in competitive and recreational sporting codes and activities. With a range or key events, RALU has reached over 31 000 students.

In addition, the Unit has pioneered Esports,[7] not only at SU, but in the USSA environment as a whole, by creating a dedicated Esports league. Now in its third year, the new-generation sporting code is going from strength to strength. A new Maties Esport website was launched for the USSA team try-outs for 32 teams in two-versus-two format games at the Neelsie in mid-August 2019. The top eight players will go on to represent Maties at the USSA national Esports tournament to be hosted at Coetzenburg Centre in September.

4.1.2 Maties Sport professional support services

Managing our 30 sporting codes remains Maties Sport's core business. As part of its contribution to the overarching vision of operational excellence of the RC: Operations and

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[7] Organised, multiplayer video game competitions, often between professional players, individually or as teams.

Finance, the Division identified a number of areas that require continued focus and improvement. They are:
- communication with all stakeholders, with a focus on upgrading the Maties Sport website;
- collaboration through internal and external partnerships;
- mentorship to support both strategic and operational deliverables;
- embracing criticism as an opportunity to learn;
- developing dashboard reporting solutions for all Maties Sport's operational units and professional support services to close the gap between decision-making and implementation; and
- improving the Division's crisis prevention plan.

Specific focus areas for 2019 are:
- communication, with a major focus on Maties Sport's digital platforms;
- retaining and improving sporting code participation; and
- senior management team mentorship for all sport managers.

Sport remains a key part of the media and entertainment industry globally, and also needs to keep up with an increasingly digitised world. Higher education sport is no exception. Therefore, to set itself apart from other players in this environment during 2019, the Division identified the following focus areas:
- Performance:
  - To win USSA and Varsity Sport competitions in at least three HP sporting codes
  - To secure promotion to the USSA A-Section, thus qualifying for Varsity Sports competitions in sporting codes that have not yet managed to qualify
  - To significantly improve SU's Varsity Sport results in athletics, hockey and netball
- Sport development:
  - To implement Maties Sport's school sport development strategy in three sporting codes
- Thought leadership:
  - To design two short courses in the Centre for Sport Leadership
  - To implement dialogue seminars on at least one theme

SU's sporting codes continue to serve as excellent ambassadors for the University, offering opportunities for recreational, competitive and HP participation, as well as research and social impact activities. In support of SU's vision, this collective offering establishes Maties Sport as a leading higher education sport department with programmes that are recognised as being excellent, inclusive and innovative.

4.2 Facilities for the next century

4.2.1 Facilities Management overview

SU's Facilities Management Division (SUFM) manages the buildings, infrastructure and sports fields across the University's campuses in Stellenbosch, Tygerberg, Belville Park and Worcester. To achieve this, the Division's 215 staff members make use of in-house and contracted service provision. The facilities portfolio is diverse, including residential, academic, commercial, office, sport and recreational facilities (see Figure 18 for an overview of the vast scope of SU's facilities).

OUR SCOPE

SU Total buildings 490

Square meters managed 820 810m²

Land Stellenbosch incl Klapmuts 478ha

Land Worcester 4ha

Total Land SU 576 ha

Land Tygerberg 24ha

Land Bellville 70ha

Figure 18: *An overview of the scope of SU's facilities*

As the custodians of SU's physical environment, SUFM's mission is to provide sustainable, safe, accessible, world-class facilities and services that enable its diverse community of stakeholders to excel.

In partnership with its service providers, SUFM aims to:
- create a world-class environment by collaborating with students and staff to create and maintain sustainable research, learning, teaching, sport, recreation and living facilities;
- provide a safe campus in collaboration with students, staff and law enforcement groups;
- align campus and facilities planning with the University's strategy;
- ensure that facilities operations are effective, sustainable and offer value for money;
- promote environmental sustainability in its planning, design, operations and services; and
- ensure that all its actions are guided by the principle that the physical environment is critical to a transformational student experience, and pivotal in attracting outstanding students and retaining talented staff.

Since the 2018 report to Council, SUFM highlights include:
- the reappointment of the Chief Director: Facilities Management for another five-year term;
- attendance of a self-development programme by all SUFM staff to embed a culture of accountability and shared values in the Division;
- the promotion of 21 staff;
- having successfully driven total electricity consumption down to 2008 levels;
- having achieved a 51% saving on water consumption compared to the 2015 baseline;
- a continuing downward trend in security incident statistics;
- the management/completion of construction to the value of R2,155 billion;
- steady progress with the Campus Renewal Project;
- increasing momentum for environmental sustainability; and
- having built and maintained a good relationship with Stellenbosch Municipality.

4.2.2 SUFM financial and business management

SUFM reports annually on all funding received from both internal and external sources, as well as how funds have been applied. Total funding received for 2018 amounted to R1 372 million, which is considerably more than the R463 million in 2017 and can be mainly attributed to the Campus Renewal Project. Contributions from faculties and departments' own funds, allocations from DHET as well as residences have all increased as the Campus Renewal Project picks up momentum.

Table 2 shows SUFM's total expenditure on the University's physical infrastructure as well as spending on enablers such as salaries, training and equipment. The ratio of spending on enablers to value-added spending on facilities improved to 1:8,5 in 2018 compared to 1:7 in 2017. This means that for every R1 spent on SUFM enablers, R8,50 is spent on the improvement of physical infrastructure. The increase in operational costs is due to extensive technical and personal development training across the Division.

Table 2: *Value-added expenditure on SU facilities, and expenditure on SUFM enablers*

Expenditure on SU facilities		Expenditure on SUFM enablers	
Source of funding	**2018 (R'000)**	**Application of funding**	**2018 (R'000)**
Campus renewal	459 516	Staff costs	69 501
DHET	169 362	Consultant costs	6 781
Main budget	435 137	Operating costs	8 503
Housing and commercial services	129 755	Equipment costs	979
Faculties and departments	177 829	System costs	4 685
Total funding available	1 371 598	Viable sourcing	
2018 expenditure	768 824	2018 total enablers	90 450
Value-added expenditure*	678 374		
Ratio of value-added expenditure to enablers	**8.5:1**		

*Value-added expenditure comprises 2018 total expenditure on facilities, minus expenditure on SUFM enablers.

4.2.3 Systems renewal

The Planon integrated workplace management solution was launched in early September 2018, when the reactive maintenance, reservations and capital projects modules were activated.

The implementation of an integrated workplace management system (IWMS) goes beyond implementing software; it requires significant change management as well. One of the biggest lessons learnt was that appointing the right change manager is a critically important decision to ensure that all parties feel included and informed. In addition, training and assistance after going live is crucial, and it is imperative for the service provider and key personnel to have sufficient knowledge to assist and guide users. While some users are realising the benefits of Planon, lingering challenges with embracing the new system remain. SUFM has therefore assigned additional resources to continuous training to help improve the user experience.

The benefits of an IWMS are substantial in terms of cost transparency, process efficiency, cost reduction and workplace performance. However, these benefits have not been fully realised yet due to ongoing challenges in terms of integration with the Oracle middleware and Natural/Adabas as well as inadequate master data. Following a decision not to integrate capital project finances with the Oracle middleware, this module is only used as a tool to register projects. Ongoing exploration of Oracle Finance's capabilities will indicate which

processes will be partially accommodated in Planon, Oracle or possibly another third-party software application.

After an intensive procurement process, a new vendor was appointed to provide a security incident management system called Online Intelligence. Online Intelligence gives SU a competitive edge by offering us crime trends-related information from external sources in addition to managing internal crime incident data. Advanced integration of incident management records with other, existing software, such as ArcGIS and the SU alarm monitoring system, enables quantitative data analysis to be applied to operational planning.

Digitisation in the facilities management field holds exciting opportunities for SUFM to become more efficient in its operations, as the data gathered can support targeted interventions. The data also allow more efficient resource management. SUFM is currently expanding the building management system (BMS) and is exploring a system for building information management (BIM). The BMS and metering have already yielded material savings on both water and electricity.

4.2.3 Property services

SUFM's Property Services function is the custodian of all infrastructural assets. Its mandate is to minimise the risk and optimise the lifecycle of all infrastructural assets and equipment. Property Services is committed to meet SU's statutory obligations and deliver optimum value in a sustainably way, making use of both SU staff and contracted service providers.

4.2.3.1 Maintenance

Property Services' maintenance execution strategy is to move from a reactive to a proactive and planned service. This will reduce the cost of providing the service in the short to medium term, thereby also lowering long-term costs by ensuring the longevity of all infrastructural assets and plant. The strategy, which entails 50% planned, 30% reactive and 20% proactive maintenance, will improve service delivery and ensure the most efficient and cost-effective operations. One of the primary drivers behind the planned maintenance programme is to optimise total cost of ownership for SU's facilities portfolio. Among others, this requires periodic condition surveys of various infrastructural assets, including plant and equipment.

Condition surveys were subsequently initiated for mechanical and electrical services, including heating, air-conditioning and ventilation (HVAC) plant, electrical infrastructure and alarms. Also included are all bulk services for which master plans have been completed and initiated. The condition surveys for the building fabric of all buildings, including envelopes and external structures, are currently being completed. These are being prioritised in terms of operational risk and criticality.

Figure 19: *New 200 kl stormwater storage tank and 10 kl greywater storage tank being installed*

Master plans and design criteria documents for the medium-voltage smart micro-grid, precinct HVAC plant, bulk water services (potable, sewer, storm, greywater) and alarm systems are being implemented in terms of the consolidated plant provision strategy. This strategy aims to reduce the amount of plant, which limits the long-term financial commitment and environmental risk. The implementation of these plans has been prioritised with due regard to the risk profile of the assets.

4.2.3.2 Utilities management

An important focus over the past year with respect to utilities management has been to improve the measuring and validity of our data on utilities consumption. Several new meters were installed and many interventions successfully implemented to manage consumption.

(i)   In terms of **electricity**, Figure 20 below indicates a consistent downward trend in consumption on all SU campuses for the past four years. This trend has persisted despite an increase in both student numbers and floor space (new buildings) as well as the densification of existing buildings.
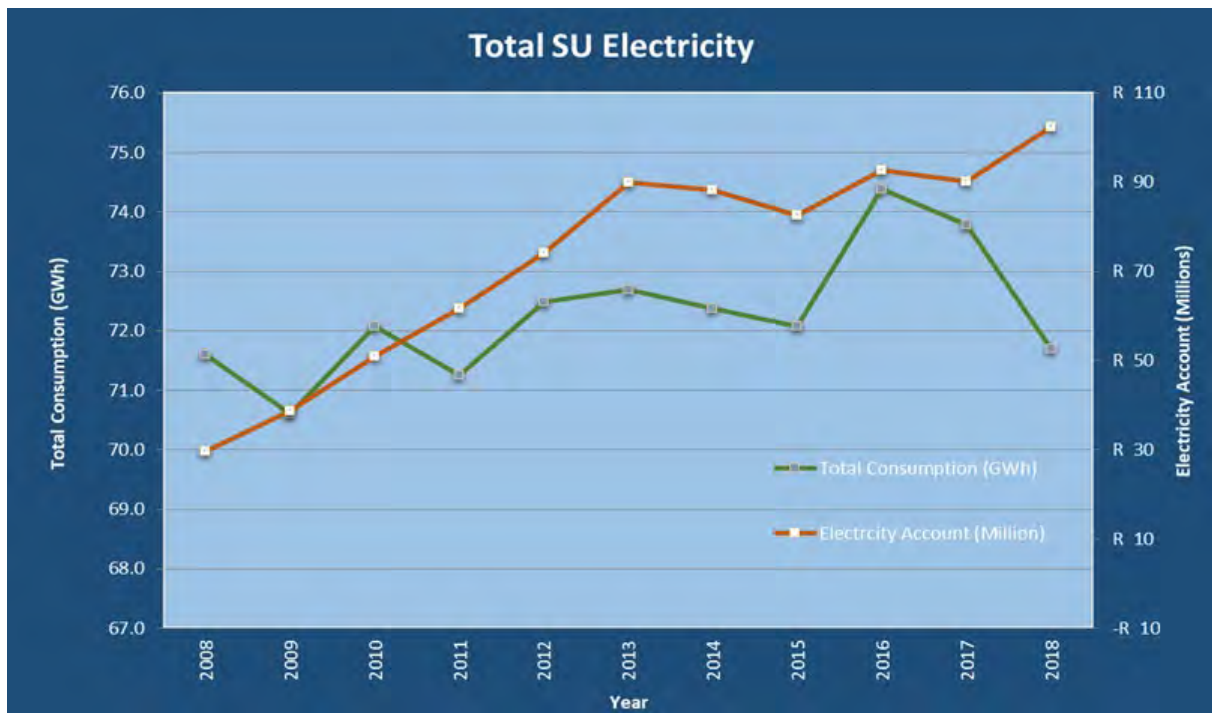
Figure 20: SU electricity consumption (gigawatt hours) and cost (rand) for the past decade. The escalation in the cost of electricity (unit cost/kWh) has far exceeded the consumer price index over this period

Likewise, consumption per student has been on a continuous downward trend for the past decade (see Figure 21 below). This is despite growth in SU's postgraduate student numbers in faculties such as Science and Engineering, whose postgraduate research laboratories are generally more energy-intensive per square metre due to specialist research equipment and longer hours of operations.

These savings have been achieved through:
• investigating and managing high night load in certain buildings;
• upgrades to medium-voltage (MV) and low-voltage (LV) equipment and the implementation of consolidated HVAC plant;
• setting the BMS system so as to switch off/on HVAC systems in certain buildings at predetermined times; and
• raising awareness among staff and students with regard to saving electricity.
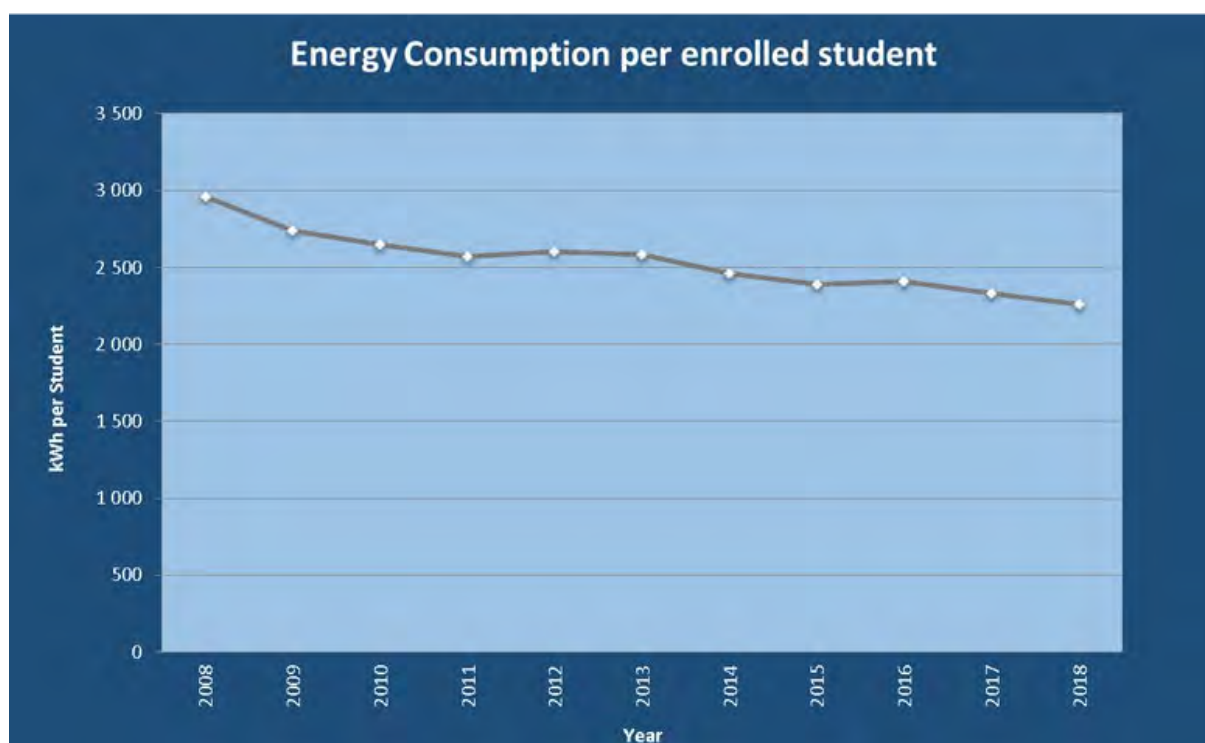
Figure 21: *Electricity consumption per student*

(ii)   In managing **water** consumption at SU, SUFM remains mindful of the fact that South Africa is a water-scarce country, and that all water sources need to be optimally used to ensure water security, including a sustainable supply for future generations. To this end, and with the advent of the Western Cape water crisis in 2016, the University agreed to implement a water optimisation strategy aligned with the United Nations (UN) sustainable development goals (SDGs), which government ratified in 2015.

In light of the serious drought from 2016 to 2018, and an impending Day Zero, the institution adopted a drought response plan in conjunction with Stellenbosch Municipality and a broad range of stakeholders. The recommendations in this plan included a reduction in potable water consumption and an overall review of water usage to ensure a sustainable future supply. This required the following interventions:
- Changes to infrastructure, the installation of aerators on taps, low-flow showerheads, stopcocks, the removal of baths, the replacement of antiquated 7-litre Flushmaster cisterns, and the installation of moisture probes in the University's landscapes
- Installing electronic live water meters
- Supplementing existing supply with boreholes
- Installing tanks for rainwater harvesting

The water optimisation strategy and interventions listed above produced a 45% saving in municipal potable water compared to baseline water consumption data from 2015.

The electronic live metering system forming part of these efforts was initiated in 2017. To date, approximately 300 meters have been installed, which transmit live data every hour. This enables us to detect deviations/leaks early on, and take the necessary action. Substantial savings have been achieved as a result, as illustrated in Figure 22 below. It is estimated that SU has saved approximately R965 000 (28 000 kl) through early detection and rapid response.
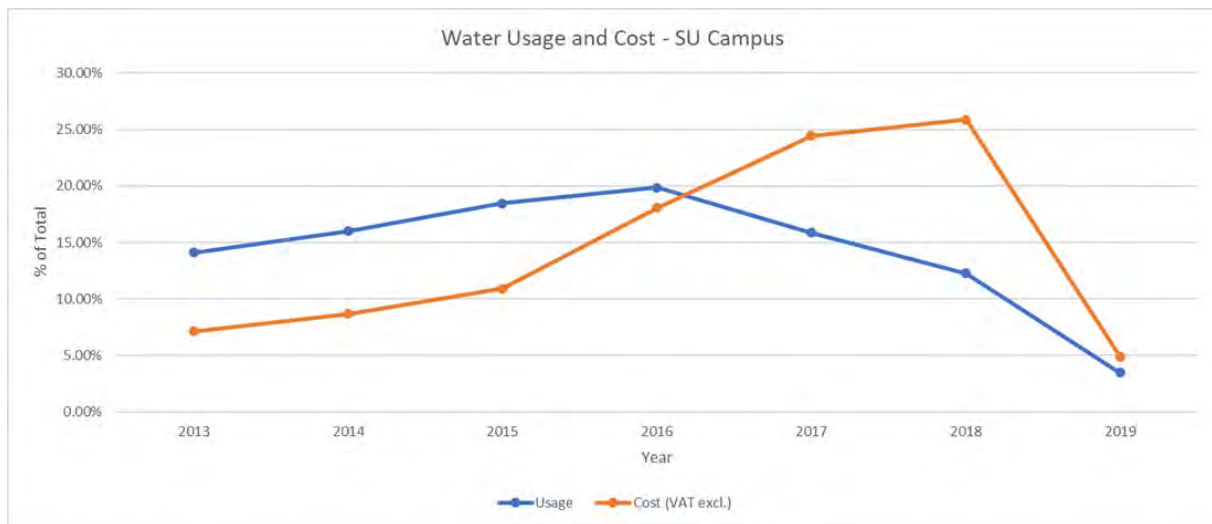
Figure 22: Water usage on Stellenbosch campus

4.2.3.3 Sustainability

SU's environmental sustainability strategy is currently being finalised. This document too is aligned with the UN SDGs as well as the University's own Vision 2040, and will focus on the eight themes of:

- energy and emissions;
- water;
- waste;
- travel and mobility;
- sustainable buildings;
- biodiversity and land use;
- goods and services; and
- engagement – leadership.

One of the primary objectives of the UN SDGs is to improve reporting so as to accurately measure our impact on the globe's temperature. SU's strategy aims to improve both measurement and reporting mechanisms in order to introduce the changes required to achieve our goals.

The ultimate objective is to reduce SU's impact on the environment and build a more resilient institution in a world that is fast depleting its finite resources, resulting in increasing climate change. SU is one of Africa's leading institutions and a member of the Association of Commonwealth Universities (ACU), and plays a prominent role on the continent. As such, SU's environmental sustainability strategy is also aligned with ACU's commitment to support the UN SGDs, and will demonstrate this commitment by leading the way in environmental sustainability.

(i)   In terms of **energy and emissions,** the success of the strategy depends on SU's ability to measure, monitor and evaluate its current actions. Achieving a culture change in our attitude to sustainability depends on ongoing tracking of performance metrics and good reporting. To create a more sustainable future, we need to reduce our dependence on finite resources used to generate energy. Using smart metering systems will allow us to analyse data and manage scarce resources.

SU is transforming its energy systems by changing electrical infrastructure and associated systems so as to reduce its greenhouse gas emissions. These electrical infrastructure interventions include an investment in energy-efficiency and

conservation programmes as well as renewable energy, such as photovoltaic (PV) installations. Our first major PV installation should come on stream in 2019.

The process of establishing a baseline for our institution's carbon footprint and greenhouse gas emissions has also started. The focus at present is to validate and verify data collection accuracy and data storage processes.

(ii)   The three-year drought saw many **water conservation** interventions implemented, which have reduced usage by 45% over against 2015 baseline data. These included awareness programmes, water efficiency equipment and augmentation schemes.

(iii)   Although, in 2018, SU's **landfill waste diversion programme** managed to reduce the amount of waste sent to landfill through a number of interventions, the quantity of waste generated by our campuses remains too high. We have successfully diverted approximately 55% of our general waste from landfill by recycling waste materials at a central material recovery facility (MRF). The implementation of the compost facility, which converts food waste into compost for use in the University's landscapes, is expected to contribute significantly to further reducing waste to landfill. A material handling optimisation plan is being developed, and will help achieve the target of 80% diversion from landfill.
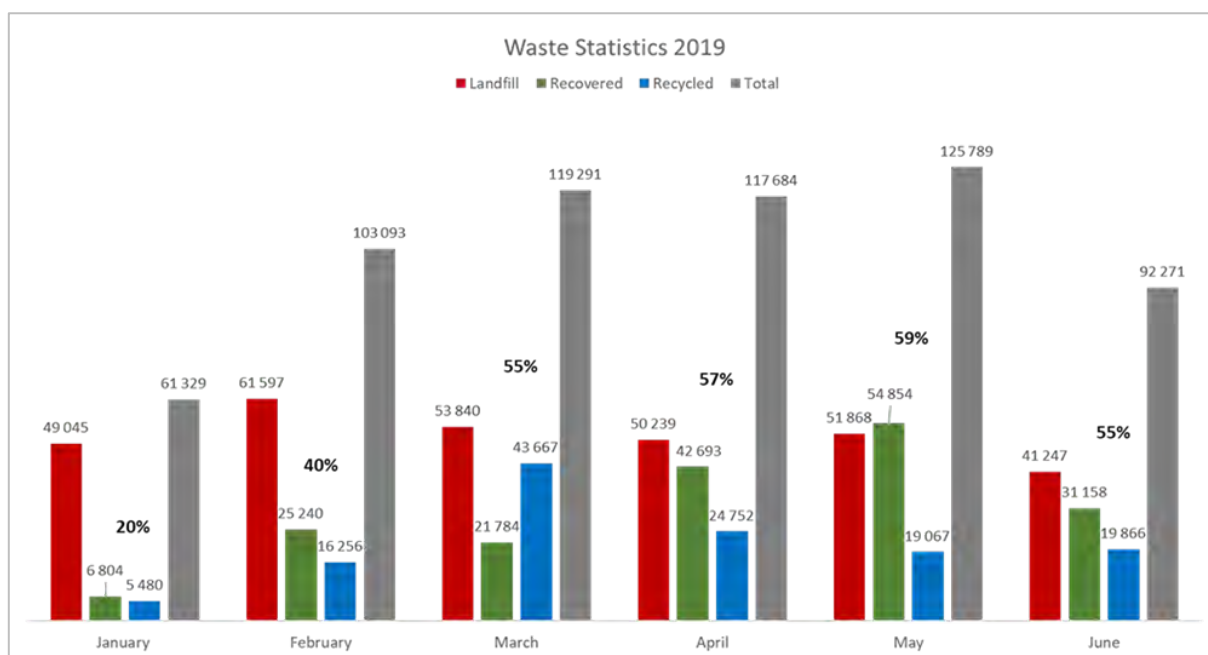

Figure 23: *Waste data generated by the new electronic measurement system installed at the material recovery facility*

(iv)   On the matter of **leadership in building design and construction**, the environmental sustainability strategy includes green building design principles, which are aligned with the Green Building Council of South Africa's (GBCSA) principles for incorporating sustainability features into all new buildings. These principles will be applied to all new SU buildings and future upgrades to the existing portfolio, keeping in mind that the construction of new buildings at SU is the largest contributor to our carbon footprint and emissions.

In addition, a new tool is being developed to create a customised sustainability rating system to assess each building's sustainability performance. This data-driven system will enable SU to identify poor-performance buildings, and to intervene to reduce these

buildings' environmental impact. An initiative to measure the performance of a first group of twelve buildings is under way.

(v)   The theme of **biodiversity and land use** is being addressed by SU's new urban landscape plan. The document details the development of external spaces that allow for reflection, exchange encounters, recreation, living and active small-group learning in support of the core SU functions of teaching, learning and research. These landscapes have been designed using water-wise plants to optimise resources and ensure long-term sustainability.

The Stellenbosch mountains, pristine rivers and reserves serve as recreational facilities for students, staff and the community, and need to be preserved. Efforts include the removal of invasive species, control of fire and prevention of erosion.

To ensure a sustainable supply of food, several food gardens have been initiated on the different campuses and are tended by students, who get to learn how to grow food in a sustainable manner in the process. These spaces are also used for recreation, to increase the health of food resources, and further reduce our carbon footprint.

(vi)   SUFM has successfully engaged the University's Procurement Department to change the supply chain to allow for more sustainable procurement practices in terms of **goods and services**. This has resulted in different types of materials being procured that are environmentally certified and bear evidence of extended producer responsibility (chain of custody). These include recyclable packaging material. Efforts in this regard will help reduce total waste generated.

(vii)   **Engagement with, and a display of leadership** to, all stakeholders in the University community is key to ensure a change in behaviour towards a more sustainable future. A number of programmes are required to place the institution on a sustainable trajectory, including events, training and awareness campaigns to reach the broader community on all campuses. For the first time, a targeted training session was held for House Committee members responsible for the green portfolio in their respective residences to accelerate change towards sustainability.

Additional initiatives to establish more sustainable behaviour include the Green Living Award,[8] and the issuing of a reusable coffee mug to each newcomer first-year student. Sustainability working groups have also been formed, comprising operational staff and academics, to incorporate environmental sustainability into every aspect of the University's business.

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[8] The Green Living Award promotes sustainable living practices in residences, Private Student Organisation (PSO) wards and student houses to reduce SU's environmental footprint. Prize money awards are made to the top achievers in each of these three categories.

4.2.4 Update on strategic infrastructure projects

Current projects in construction are valued at over R2 billion (see Figure 24 below).

Figure 24: *Overview of current major construction projects*

The following maps show the extent to which our campuses are affected by construction activities. Managing this level of construction activity at a fully functional university is one of SUFM's greatest challenges.

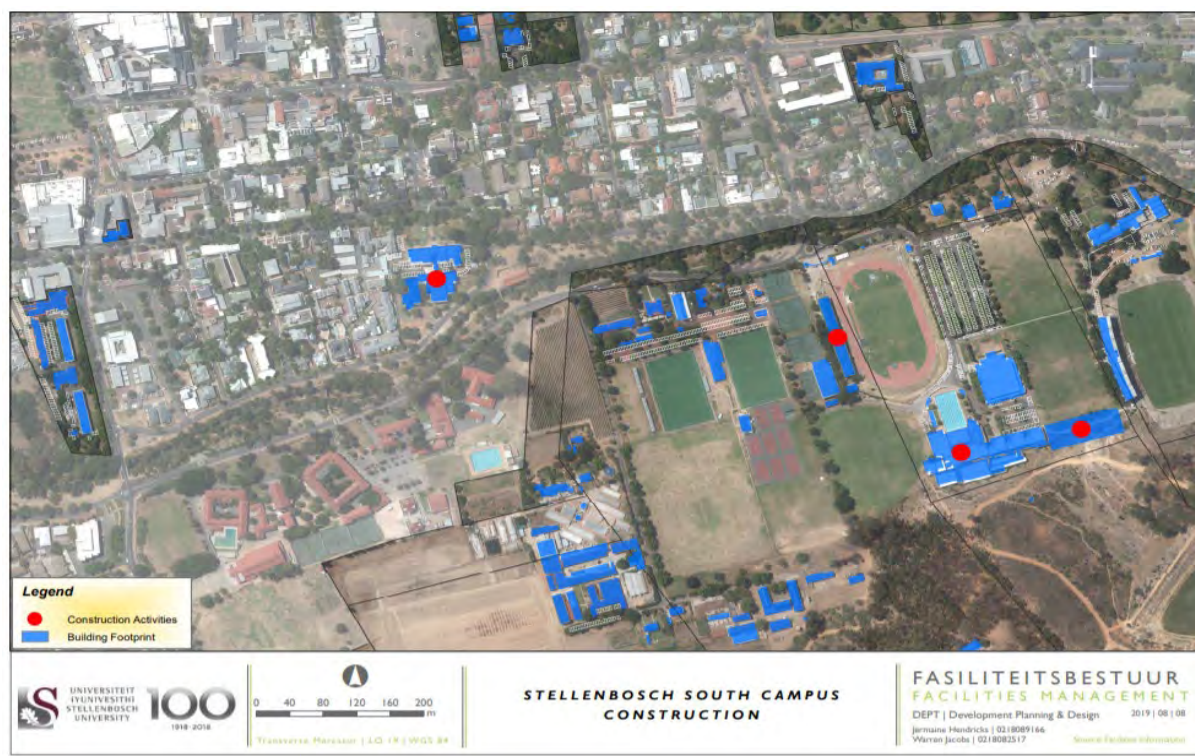*Figure 25:* *Stellenbosch north and central campus construction map*

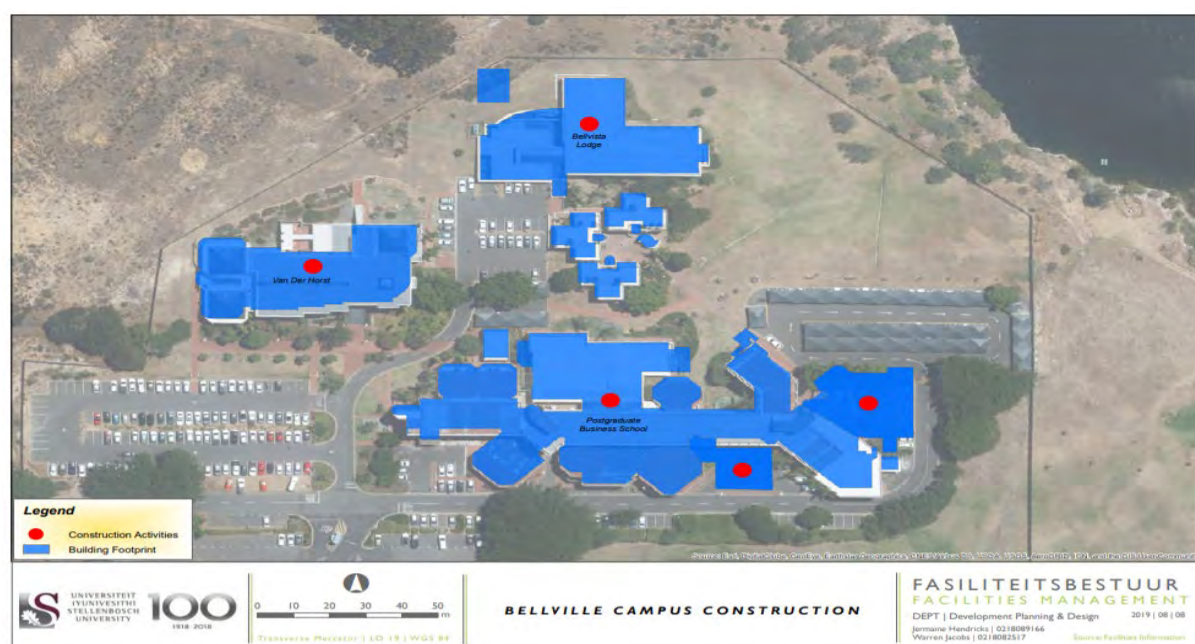*Figure 26:* Stellenbosch south campus construction map

Figure 27: Bellville Park campus construction map

Figure 28: *Tygerberg campus construction map*

4.2.4.1 Stellenbosch campus, Jan Mouton Learning Centre

In September 2017, SU approved the construction of the new Jan Mouton Learning Centre at a project value of R255 600 000. Construction commenced on 1 November that year, with a planned completion and occupation date of 20 January 2020.

On 12 March 2019, the main contractor, Group Five Construction, notified SU that their company would be placed under business rescue. This had a massive impact on the construction activities and programme, resulting in a full two months of very little action and progress on site. The project has since been ring-fenced by the business rescue practitioner as one of the projects to be completed by Group Five Construction, and it is currently funded by Lombard Insurance, the surety holder for the project. Contractually, Group Five must complete construction activities by 7 October 2019. However, the project team evaluated the revised programme and determined that this would not be achievable.

The project team are now exploring various contractual options to establish whether the main contractor will be able to complete construction by 13 December. All commissioning of plant and the fit-out of the facility are scheduled for the first half of 2020, with occupation planned for the start of the second semester of 2020 (July).

Figure 29: *Jan Mouton Learning Centre north elevation*

4.2.4.2 *Tygerberg campus, Biomedical Research Institute (BMRI)*

The construction work permit for the Biomedical Research Institute (BMRI) was submitted to the Department of Labour on 23 November 2018 and the permit issued on 12 December 2018. Building plans were approved on 22 January 2019.

Having awarded the project to principal contractor WBHO on 15 November 2018, the site was handed over on 14 January 2019. The project will be completed in three phases, namely:
- phase 1 (zone 1), comprising the new building;
- phase 2 (zone 2), involving the refurbishment of level 5 and 4 (in that order) of the existing FISAN building; and
- phase 3 (zone 2), which will see the refurbishment of levels 3, 2, 1 and 0 (again in that order) of the existing FISAN building.

The fully automated -80 °C biobank unit (Hamilton BiOS) was ordered and, at the time of writing, was scheduled to arrive for installation on Tygerberg campus on 19 August 2019. The installation of the BiOS is scheduled to be completed on 10 February 2020, after which the process of loading the samples into the BiOS will commence ahead of phase 2.

Construction progress as at the end of July 2019 was 16%, and the status of on-site activities was as follows:
- Zone 1 new building columns: 100% complete on levels 0–2, 80% complete on levels 2–3, and has commenced on levels 3–4
- Zone 1 new building surface bed: complete
- Existing FISAN building (zone 2): concrete works for the biorepository area as well as western side infill slabs construction up to level 4 complete
- Works on the service lift on the southern side of the FISAN building have commenced.

The Green Star specialist consultant completed phase 1 of the green building process, namely the identification of likely and potential credits, and confirmed that the building will achieve a minimum four-star rating by design. Phase 2, which involves the drafting of a submission to

the GBCSA, has commenced. The submission should be ready to be tabled to the GBCSA in January 2020.
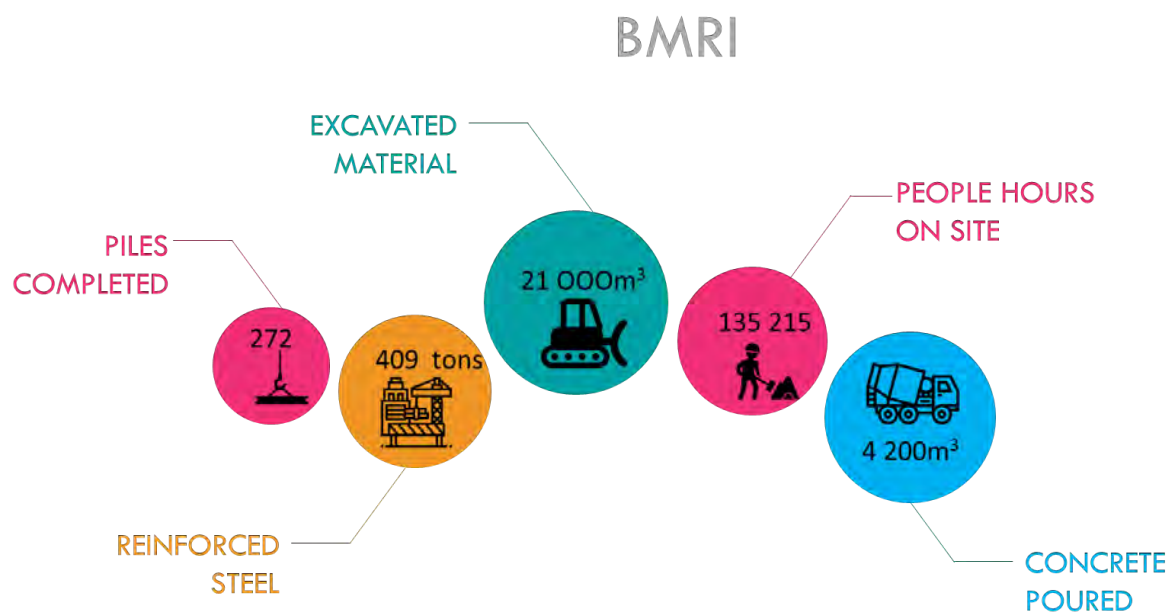

Figure 30: BMRI information as at the end of July 2019

Figure 31: BMRI new building construction progress as at the end of July 2019

Figure 32: *Progress with BMRI western infill to FISAN building as at the end of July 2019*

4.2.4.3 Stellenbosch Campus, Engineering campus renewal project

(i)   The appointed principal contractor for the **new Civil Engineering Pavement Laboratory,** GVK-Siya Zama, commenced construction in late November 2018. The concrete work for the superstructure is currently in progress, with the roof structure and steelwork to follow shortly. Work is reported to be on schedule for occupation in February 2020. Upon completion, the Pavement Laboratory will unlock future phases of the Engineering campus renewal programme and will be the catalyst for additional lecture space and growth potential for the Faculty of Engineering. The value of this current phase is estimated at R51 150 767.

Figure 33: *New Pavement Laboratory northwest elevation*

(ii)   On the **Mechanical and Mechatronic Engineering building project**, principal contractor GVK-Siya Zama started construction in late November 2018. With the demolition work completed, the internal fit-outs are now under way. The concrete superstructure to the new entrance lobby and services shaft is well advanced. The new FIRGA and electronic classrooms will provide future growth potential for the Faculty of Engineering.

The project, which has an estimated value of R109 887 166, consists of several distinct work packages, namely:
- a new 311-seater student computer user facility situated on the ground level;
- three new electronic classrooms on levels 2 and 3, which will provide 469 seats;
- a new Mechatronic Laboratory with 51 new workstations; and
- upgrades and densification of offices and postgraduate open-plan areas on levels 4, 5 and 6.

(iii)   The **Electrical and Electronic Machine Laboratory** project is carried out in two phases. The first phase includes renovations to the Electrical quad area. This area will then serve as a decanting space for tutorial classes during the construction of phase 2, which will consist of major renovations to the old Machine Laboratory.

Figure 34: Artist's impression of the new Machine Laboratory

Work on phase 2 includes:
- the construction of a new second-level mezzanine floor to provide additional laboratory space;
- upgrades to all essential services, including a new ducted fresh-air supply system, upgrades to electrical and lighting circuits, replacement of the main-supply distribution board, new access control points, and upgrades to the fire alarm systems;
- the replacement of the waterproofing on the existing concrete roof to solve the current leakage problems;
- upgrades to the existing laboratory work benches so as to house new, modern equipment to be used during lectures; and

- two new fire escapes to exit from the northern and southern ends of the existing building.

Principal contractor GVK-Siya Zama completed renovations to the quad area (phase 1) in July 2019. With the quad now handed back to the Department, renovations to the Machine Laboratory can gain momentum to be completed by March 2020. The project value for phase 2 is estimated at R15 714 067,83. Upon completion, the new laboratory will provide 27 new workstations for tutorials and practical classes.

(iv)   Concept design work on the **Engineering Faculty's spine/link walkway** is in progress. When completed, the new spine walkway will improve general circulation, provide universal restrooms, and have adequate access control points to improve 24-hour security. Construction on the first section of the walkway around the Mechanical and Mechatronic Engineering building is planned to commence in the second half of 2019. Future work on this project will be carried out in sections as part of bigger renovation projects in the future.

(v)   The total project cost of **upgrades to the bulk sewer system** is R3 494 294. The project, which was completed in early 2019, has now replaced the Faculty's old, redundant sewer pipes and provided a new reticulation system.

(vi)   The project to **upgrade the Joubert Road parking area** cost R3 703 681,93 and was completed in early 2019. The extensively upgraded parking area now provides 22 new staff parking bays, securely fencing and card access control.

(vii)   The complete **refurbishment of the existing male and female toilets on levels 1 to 4 of the departments of Civil as well as Electrical and Electronic Engineering** has an estimated construction value of R15 000 000.

The planned renovations will include:
- replacement of the old cast-iron stacks with new ones;
- new internal layouts to comply with building regulations;
- upgrades to the fresh-air supply; and
- new finishes.

Construction is planned to commence in the latter part of 2019. A phased programme will be implemented to minimise disruption, and renovations will be carried out one ablution facility at a time.

4.2.4.4 Bellville Park campus renewal project

Campus renewal at Bellville Park has been divided into four tender packages, of which two are currently being implemented and thus reported on below.

(i)   For **tender package 1**, new potable and fire-ring mains have been installed on campus. We are currently awaiting the installation of the new bulk water meter and new connection at Carl Cronje by the City of Cape Town. The water filtration plant has been commissioned and will feed potable water to campus as soon the necessary licence has been obtained.

Figure 35: *Bellville Park campus water filtration plant*

The new central HVAC plant is in its final stages of commissioning. At the time of writing, the target was to provide six newly renovated and constructed lecture venues with centralised HVAC by the end of August 2019.

The new parking area, which now provides an additional 131 parking bays, has been completed.

Figure 36: New Bellville Park campus parking area

The first phase of the Bellville Park electrical master plan has also been implemented. This involved the installation of the new MV ring main and new mini-substation to address the future demands of the campus and the new facilities.

(ii)   For **tender package 2,** construction of the new library has been completed, including two new lecture facilities.

Figure 37: New Bellville Park campus library

The first phase of the new cafeteria has also been completed, and the second phase (renovation of the existing cafeteria) is in progress.

Figure 38: New Bellville Park campus cafeteria

The new lecture hall has been completed, and is currently being used for the campus's blended-learning classes. In addition, various lecture hall upgrades have been completed and the remaining venues are due to be handed over by September 2019.

Figure 39: New lecture hall in Van der Horst building, Bellville Park campus

At the time of writing, the new Space Bar was still in construction and due for completion towards the end of August 2019.
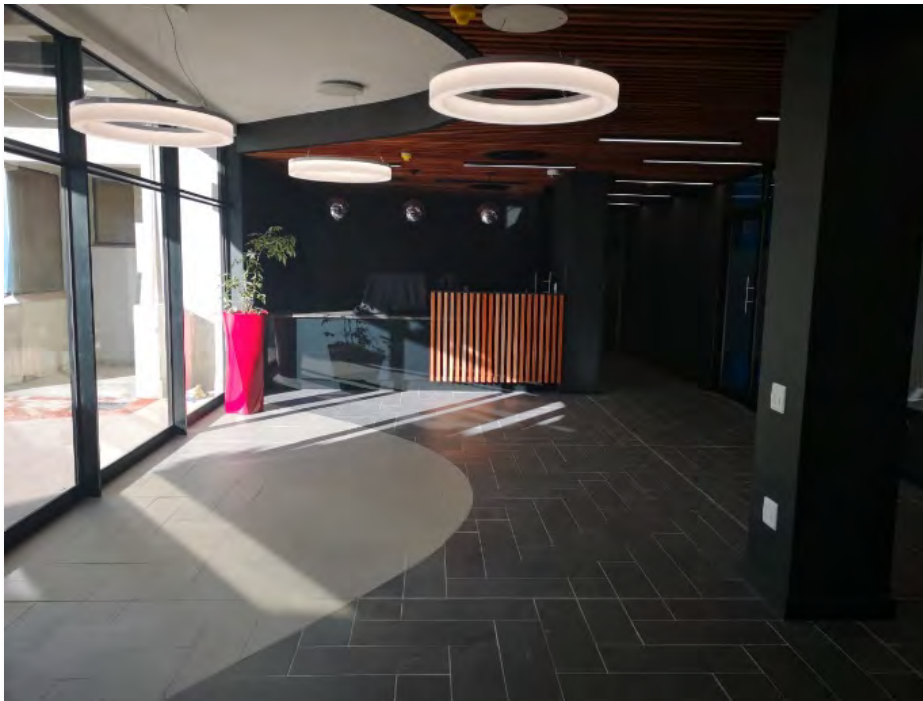

Figure 40: *Bellville Park campus Space Bar*

The upgrade to the Bellvista Lodge bathrooms and facade is in progress, as is work on addressing the fire compliance of the building. This project also includes an upgrade to the Van der Horst building facade.

4.2.4.5 Stellenbosch campus, Helshoogte residence upgrade

Phase 1 of the Helshoogte upgrade was successfully completed and students took occupation of the new rooms in January 2019. Phase 2, valued at R26 014 000, started in November 2018 to allow for demolitions to be carried out during the 2018/19 year-end holiday period, thereby minimising the noise and dust impact on residents and the surrounding environment.

The proposed phase 2 completion date is 17 January 2020. This phase entails the completion of the new external services, including a new IT backbone serving Helshoogte and Simonsberg, as well as installing a header tank on the roof for the new greywater reticulation system serving the rest of campus. It also includes upgrades to existing rooms and bathrooms.

To execute phase 2, a total of 148 rooms were decommissioned. The remainder of the building is being occupied while work is carried out, requiring a phased approach. The proposed appointment date for phase 3 is 11 October 2019.
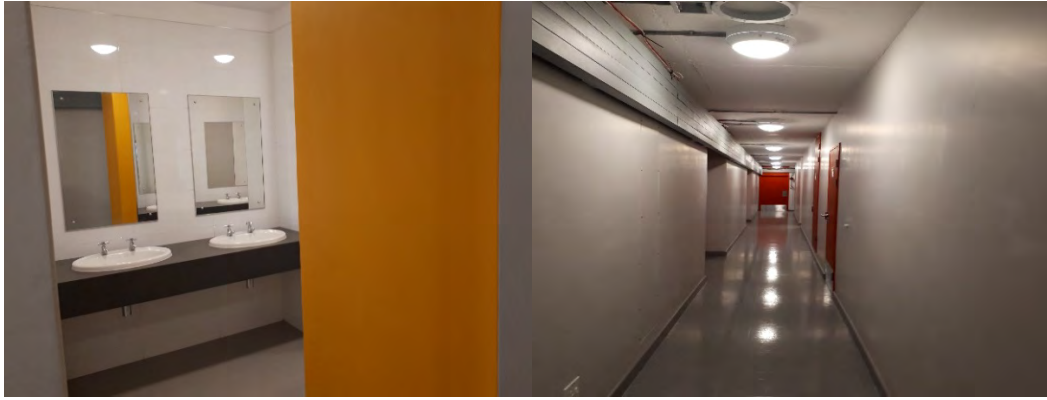
Figure 41: *Helshoogte completed phase 1 bathrooms and passage*

4.2.4.6 Stellenbosch campus, Maties Sport campus renewal

The CRP allocation for sport projects amounts to R128 million. Nine projects for Maties Sport have been completed to the value of R86 million. Next up in terms of this project is the master planning for the Danie Craven Stadium, and master planning and implementation of upgrades to the Coetzenburg Centre.

4.2.4.7 Stellenbosch campus, ICT optic fibre route for south campus

This project will provide a new optic fibre route from Heemstede residence to the Coetzenburg athletics stadium to provide a reliable network service to the south campus.

Since the appointment of the civil engineering consultant towards the end of 2018, the design of work stages 1–3 has been completed and approved by the IT Department. The design of work stage 4 was in progress with completion anticipated by the end of August 2019 at the time of compiling this report.

In terms of local authority and institutional approvals, plans were submitted to and approved by the town council in May 2019. The project charter was also approved in May, and approval for the project at an all-inclusive estimated cost of R4 224 991 was obtained in June.

The tender process is scheduled for September, and contractor appointment for October. Construction is expected to take nine months, with completion by July/August 2020.

4.2.4.8 Stellenbosch campus, electrical master plan

(i)   The project to **upgrade the electrical switchgear at the Arts and Social Sciences building, including enlarging the MV room**, is in the conceptual design phase, and scoping is in progress.

(ii)   The upgrade to the **MV network of the SUFM complex** is in progress. The existing MV and LV cables are being rerouted, with the incoming MV cable to the precinct to be rerouted as a preliminary measure. Construction on the new LGS substation was due to start in August 2019. Completion of this project is planned for April 2020.

4.2.4.9 Stellenbosch campus, Coetzenburg Institute of Sport and Exercise Medicine (ISEM) Laboratory

The intention is to execute the new ISEM Laboratory and the upgrade to the existing Sport Sciences lecture halls as a single project. The professional team was appointed in 2018.

In its entirety, the project will provide:

- a new building to accommodate the ISEM Living Laboratories, including associated administrative spaces and parking; and
- upgraded Sport Sciences lecture halls as per user requirements, including outstanding building maintenance and an upgrade to building services.

(i)   **Progress**

In terms of design progress on the new ISEM Laboratory building:

- work stages 1–2 of the architectural design have been completed in conjunction with the users of the building and SUFM;
- work stage 3 of the architectural design is currently in progress;
- the conceptual designs for the building services have commenced; and
- cost estimates are being updated as the design progresses.

To complete the ISEM concept submission and obtain approval, confirmation is required with regard to the integration of Maties Sport with the new ISEM facility, the integration of the external radiology unit with the new ISEM facility, as well as project funding.

Figure 42: *Conceptual design proposal for the ISEM Laboratory building*

With regard to the upgrade to the existing Sport Sciences lecture halls, in turn:

- a summary of user requirements was provided and prioritised, which has clearly shown that the available funding will not be sufficient to adequately address all the requirements;
- an assessment of the building condition and structure was completed in 2018, as professional building assessments are required for all building services;
- existing building statutory non-compliance and maintenance requirements will be given priority; and
- a project approach report containing all costs and programme options is being drafted.

(ii)   **Budget**

The current brief for the ISEM project is estimated at an all-inclusive cost of R88,6 million, subject to a 30% change. The total cost up to tender stage is

R8,981 million, of which R1,838 million has been spent to date. Full funding for project construction is required before the end of 2019 to sustain project momentum and avoid abortive costs.

The confirmed available funding for the Sport Sciences upgrade is R9,1 million (all-inclusive), excluding a funding contribution by IT for network connectivity, which is estimated at a further R2,5 million.

(iii) **Programme**

The target for the formal approval of the ISEM project concept was set for end of August 2019 so that engagement with the local authority could commence. The project tender process should take place in the fourth quarter of 2019, with contractor appointment anticipated in the first quarter of 2020. Building occupation is anticipated for the first quarter of 2021.

In terms of the Sport Sciences upgrade, the final approved project scope will determine the programme.

(iv) **Submissions and approvals due**

Approval of the project charter is due by the end of September 2019, and plan approval by the local authority by the end of the year.

4.2.4.10 Stellenbosch campus, greywater project

The SU greywater system will reuse wastewater on campus by isolating and collecting shower greywater from selected residences and distributing it to a centralised treatment plant and storage area. From there, treated greywater will be pumped to a campus header tank, and gravity-supplied back into a non-potable network. This treated greywater network will be plumbed into several buildings to be used for toilet flushing, at which stage the existing municipal supply to these toilets will be disconnected. Excess treated greywater at the plant not used for toilet flushing will be directly injected into the irrigation network.

Phase 1 of the project will provide greywater to 433 toilets. At the time of compiling this report, the expected completion date was the end of August 2019.

4.2.4.11 Tygerberg campus, greywater project

The project commenced on 2 August 2019 and should be completed by the end of March 2020.

4.2.4.12 Stellenbosch campus, Arts and Social Sciences services densification and decanting

In addition to statutory compliance, backlog maintenance and essential services upgrades, the CRP also provides for building capacity enhancements to allow for planned future growth of the academic project. In this regard, the total available funding for the upgrade and densification of the Arts and Social Sciences building is R74 000 000.

Of this, R3 000 000 has been spent on compiling a master plan for densification of the building, as well as the proposal for a decanting annex to be built on top of the existing lecture rooms in the south. The most recent proposal for the decanting annex was submitted to a heritage consultant for review as per the section 38 national heritage statutory requirements. The consultant prepared the required guidelines, which have been incorporated into the concept.

At this stage, the pre-feasibility estimate for the decanting annex totals R40 000 000. That would leave only R31 000 000 for the densification of all services in the existing building,

which is deemed insufficient to address all the statutory, IT, general services and other upgrades and densification requirements. The estimate has been reduced to the bare minimum required to construct the building. It excludes many ancillary works that would in fact contribute to a well-planned, holistic solution for the entire precinct, unlocking the potential of the open space between the Arts and Social Sciences building, the GG Cillié building and the Crozier Street houses.

SUFM will proceed with a high-level feasibility study to look at development rights within the regulatory constraints for this precinct, and to determine a phased approach to the upgrade and development.

4.2.4.13 Stellenbosch campus, upgrade to lecture rooms and bathrooms on level 1 of Schumann building

As part of the master plan for the densification of the Schumann building, the Faculty of Economic and Management Sciences identified an upgrade to lecture rooms and bathrooms on level 1 as their first priority and project phase. The Schumann building dates back to 1973 and has not had any comprehensive refurbishment since then.

The project scope includes the complete refurbishment of lecture rooms 101, 104 and 107, as well as both bathrooms on level 1. All seating as well as electrical, electronic, audio-visual and mechanical services will be upgraded to the latest specifications. The bathrooms will be densified and refurbished, and a new wheelchair-accessible facility added.

The site was handed over on 3 April 2019. The project is currently 45% complete. Lecture room 101 had to be completed and ready for class by 22 July. This milestone was successfully reached and a sectional practical completion certificate issued. Practical completion for the whole project is scheduled for 22 November 2019. The project is currently on time and within budget.
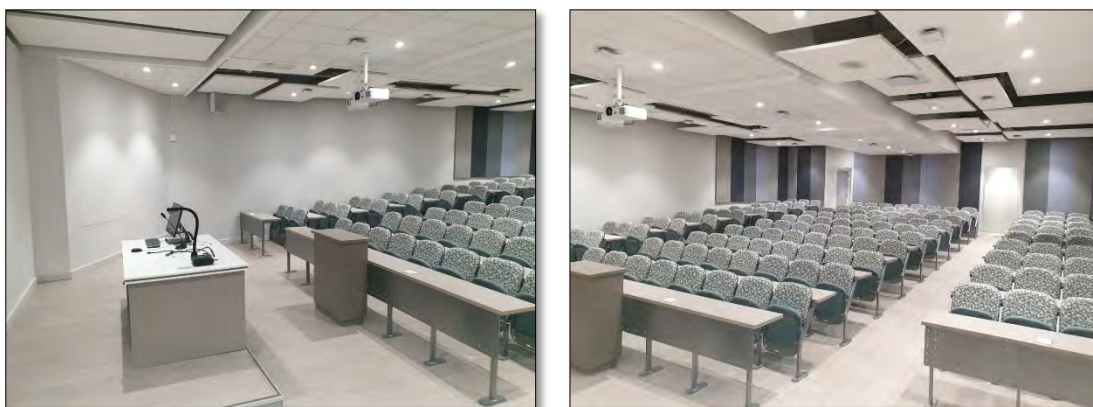

Figure 43: Upgraded lecture hall, Schumann building

4.2.4.14 Stellenbosch campus, Victoria hub

Phase 2 of the DHET housing project commenced in 2013. Since then, the concept has gone through several iterations and pauses due to insufficient funding. In 2017, it was decided to split the housing project from the hub project. The proposed location for the housing project was identified as the Goldfields site, and the proposed location for the hub was identified in the Victoria cluster.

The Victoria hub underwent further conceptualisation in various forms until the latest concept was proposed and accepted by the University management at the end of 2018. In

March 2019, the project quantity surveyor withdrew his services from the project. The service provider's involvement with the project was finalised in June, and SUFM has since made contact with an alternative quantity surveyor to take over and proceed with the project.

A meeting was held with a consultant to initiate the heritage process. It is hoped that the new building will require only a notification of intent to develop (NID) under the section 38 requirements. If this proposal is not accepted by Heritage Western Cape, a complete heritage impact assessment process will have to be followed, which will cause considerable delays to the programme.

SUNCOM has requested that the PSO accessibility for Monica and Harmonie residences be included in the Victoria hub project and funded from the available PSO accessibility project funding as per SUNCOM's annual budget.

The CRP funding available for the project totals R50 000 000. The current pre-feasibility estimate, excluding the PSO accessibility requirements and the expected new ICT route inclusion, amounts to R57 000 000. Note, however, that this pre-feasibility estimate may be out by up to 30% either way. If escalation is added to the CRP funding, the project estimate will be within budget, especially in view of the fact that the hub includes 14 bedrooms, which must be funded from the SUNCOM budget.

4.2.4.15 Tygerberg campus, PET/CT scan building

The Western Cape Department of Transport and Public Works constructed a building at Tygerberg Hospital to house the Western Cape Academic PET/CT Centre (WCAPC) and its associated radio-pharmacy. It opened in 2012 as a Western Cape Department of Health facility managed by the Division of Nuclear Medicine of SU and Tygerberg Hospital. The facility is used for clinical work that aims to reduce the burden of disease on South African society and serves several state hospitals in the region who require access to such services. This leaves very little time for SU's research work at the facility.

The national Department of Science and Technology's Nuclear Medicine Research Initiative (NUMERI) has provided funding to create a node for infection imaging (NII) for research purposes at Tygerberg Hospital. This funding covers the cost of purchasing a new PET/CT scanner as well as upgrades and expansions to the existing radio-pharmacy, which the two PET/CT facilities will share.

SU, in turn, has raised the funding to construct the building to house the new scanner, which is proposed to be an extension to the existing facility. The Western Cape departments of Health and Public Works have since concluded an MOA with SU, which agreement is intended to cover the building of the structure, its donation to Tygerberg Hospital, and the subsequent functioning of NII as a facility managed by SU's Central Analytical Facilities.

The PET/CT scan building will be located in the Tygerberg Hospital precinct, adjacent to and north of the existing WCAPC. The site is situated on erf 14298 in the Tygerberg planning district. The new building will have a separate public and patient entrance, and be linked to the WCAPC through an interleading passage. The location of the PET/CT scan building is highlighted in red in Figure 44 below.

Figure 44: PET/CT scan building location (highlighted in red)

The Western Cape Department of Public Works will be the registered owner of the NII PET/CT building once completed. The new facility will fall under SU's Central Analytical Facilities, but will work closely with the Division of Nuclear Medicine (Department of Medical Imaging and Medical Oncology), which will continue to be responsible for the existing facility. The new PET/CT scan building will accommodate the NII, which will function solely as an SU research facility, without any overlap with the operational functions of the WCAPC or the broader Tygerberg Hospital.

The design ensures compliance with the national Directorate of Radiation Control's requirements for radioactive protection. The approved control budget for the 369 m² NII PET/CT building and adjacent 47 new parking bays is R18 508 021,08. The construction site was handed over on 12 March 2019, with a practical completion date of 4 November this year. At 54% construction progress, the project is on schedule.

4.2.4.16 Stellenbosch campus, SU Library upgrade

The newly appointed architects met with the client, and ideas were shared to expedite the planning and detailed design phase. The rest of the professional team remains the same.

The new foyer upgrade as well as service areas and ablutions must be integrated with the recently upgraded staffroom and Learning and Research Centre. This CRP initiative is expected to provide innovative spaces for collaborative learning and research. The provisional budget estimate for the project is R17 858 500.

4.2.4.17 Stellenbosch campus, upgrade to seminar room 1031 and ground-floor toilets, JH Neethling building

The professional team has been instructed to revert to the original phase-1 scope of works, which entails an upgrade to two seminar rooms, two ablutions blocks and two local-area network (LAN) rooms. The provisional budget estimate for the project is R24 300 000.

4.2.4.18 Stellenbosch campus, GG Cillié project phase-1 roll-out

This project entails upgrades to the science laboratory and entrance lobby, mainly also addressing new regulatory requirements in terms of fire safety. Master planning and investigations have been finalised and the phase-1 roll-out is ready for execution. The principal agent and quantity surveyor are currently compiling the tender report for review. At the time of writing here, site handover was scheduled for 19 August, and the provisional project budget is estimated at R16 434 000.

4.2.4.19 Stellenbosch campus, new decanting facility and gatehouse entrance

The appointed principal contractor, GVK-Siya Zama, commenced with construction in mid-May 2019. Work has mainly consisted of removing existing underground services and casting concrete foundations. The contractor is currently behind schedule as a result of poor weather conditions as well as delays in accessing certain areas to proceed with construction. The revised anticipated completion date of the facility is now mid-May 2020.

Upon completion, the decanting facility will be the catalyst for additional decanting space to improve overall project roll-out on Stellenbosch campus. The estimated project value is R113 857 247,46.

Figure 45: *Design for the new decanting facility on the north campus*

4.2.4.20 Challenges with renewal and upgrade projects

The challenges experienced and dealt with in terms of the CRP in 2019 are listed below. These challenges will affect similar projects in the coming years and will have to be managed within the framework of every individual project:

- The maintenance backlog, specifically in terms of infrastructure, is severely affecting projects on all campuses. Where possible, the backlog projects are incorporated into the renewal projects to limit disruption to the academic programme. This, of course, has an effect on project budgets and scope.
- SUFM is currently managing 157 projects with a project value of R2,98 billion. Of these, 38 projects to a value of R2,155 billion are in the construction phase, stretching available resources to the limit.
- The process to obtain local authority plan approval takes up to six months, which delays project execution.
- The issuing of construction work permits takes up to 60 days, instead of 30 days as published by the Department of Labour.
- SUFM recently measured noise levels in live construction environments where staff still occupy spaces while major refurbishments are carried out. In some instances, the construction noise levels reached 90 decibels, far exceeding the prescribed standards and regulations allowing a maximum of 35–45 decibels for office environments. SUFM is currently putting measures in place to address this.
- The start of major refurbishment projects in laboratory areas is starting to affect the practicum academic programmes, which now have to be decanted to temporary laboratories and/or changed to online practicum sessions.
- Some laboratory equipment is sensitive to dust and vibration, and needs to be protected during construction.

4.2.5 Implementation of an enterprise geographic information system (GIS) interface for SUFM

SUFM has transcended its GIS platforms with an enterprise GIS interface to ensure a sustainable, integrated database for facilities information. The new interface is a data storage and retrieval solution that enables visibility, accessibility and mobility of facilities information across the institution. SUFM utilises the enterprise GIS interface as a solution to enable relevant stakeholders to leverage all facility-related information portals.

The GIS dataset is an all-encompassing source of facilities information that offers SU the following benefits:

- **Cost savings due to greater efficiency**, enabling SUFM to do more with less (i.e. labour savings due to automated or otherwise improved workflows)
- **Better decision-making** by management, typically about site selection, route/corridor selection, zoning, planning, conservation, natural resource extraction and space analysis
- **Improved communication and reporting**, as GIS-based maps and visualisations deepen understanding and improve communication between teams, departments, disciplines, professional fields, organisations and the public
- **Advanced digital record-keeping**, including records of zoning, land ownership, infrastructure services, spatial use and administrative boundaries

4.2.6 Universal access to SU facilities

Universal access to all SU facilities is an SUFM priority and a core principle during the planning and design phase of any capital project.

SUFM also regularly liaises with the local authority where access challenges are a municipal responsibility (such as uneven sidewalks), and discusses implementation plans with the relevant municipal directorate to address problems.

It is equally important for SUFM to interact with SU's Disability Office to continuously improve universal access on campus. In this way, all campus areas that have a negative impact on universal access will be identified, prioritised and addressed through implementation plans, and reviewed annually in collaboration with the Disability Office.

4.3 Adopting IT as a mode of business

The IT Division empowers all stakeholders by providing ICT systems, services and infrastructure that support the University's mission of being excellent in learning, teaching, research and social impact.

The Division is also firmly on course to reinvent itself and grow into a mature, capable entity geared to deliver excellent ICT support services in collaboration with both internal and external partners. One of the ways this has been achieved was through the service delivery model review, which has just been concluded. The IT Division management embarked on this thorough and systematic review of its operational processes to standardise, formalise and improve the services the Division delivers. The review has culminated in a new service engagement model, which will now be implemented for all IT work streams.

Effective service management is critical for an IT service division at a university. The IT Division's self-evaluation conducted in 2016 pointed to low process maturity, low visibility of IT workflow, which caused uncertainty as to how stakeholders should engage with IT, as well as poor progress feedback to stakeholders. Therefore, the goal was to develop a mechanism to improve overall efficiency and, more importantly, build valuable partnerships with IT's clients and stakeholders. The IT service engagement model has been designed to improve the Division's service delivery management, and ultimately change its role from primarily delivering generic IT infrastructure and services, to being a valued partner who can deliver capabilities in support of SU's strategic priorities.

By adopting the service engagement model, the Division will be introducing clear engagement points with its users and stakeholders. These will improve service communication and feedback, and enable IT to identify where workflows need to be improved. More specifically, the implementation of the model offers the following key benefits:
- **Evolution towards maturity** – defining and formalising business processes, continuously improving processes, and increasing understanding and integration of business processes
- **Information availability** – contributing to decision-making, measuring quality, recording demand, increasing workflow visibility, and providing feedback to stakeholders
- **Standardisation and integration** – adding value for a more manageable IT environment and homogenous business processes, which improve the overall understanding of the business

- **Repositioning IT in both approach and attitude** – creating processes to provide the capabilities that the University requires to achieve its strategic objectives and goals, being sustainable, increasing responsiveness, and enhancing the ability to focus on core competencies

4.3.1 ICT service delivery model review (SDMR)

In the latter part of 2018, the COO requested an objective review of the current ICT service delivery model to optimise efficiency and resource application, and align with the changing role of ICT. The existing service delivery model, which evolved over many years, was shaped by various environmental changes and has historically been provided through a complex structure of varied services. This resulted in each faculty drafting individual IT environmental plans (strategic or operational), which were not always sufficiently integrated to achieve the capabilities that the University requires.

The SDMR contract was awarded to Deloitte Consulting Services and the review started towards the end of 2018. It was led by a senior and representative steering committee, who consulted widely across all relevant structures. With its targeted focus areas being the scope of IT's services, access to its services and the cost of its services, the review had as its main objectives to:
- develop a comprehensive understanding of the current state of ICT services across the University;
- develop an integrated capability mapping model aligned with and directly supporting SU's strategy;
- design a desired service delivery model so as to achieve the capabilities required in the short and longer term; and
- propose an implementation plan.

The SDMR review was concluded in June 2019 and subsequently presented to the Institutional Management Forum on 24 July. Key findings were:
- that the existing IT service delivery model had evolved organically (30+ units), without proper integration;
- that IT's services were perceived as inefficient, costly and obsolete; and
- that because of this, SU was missing out on opportunities in teaching and learning, in research, as well as in how we conducted our business.

As the review advanced, it was determined that:
- a needs-driven model was the right model to meet SU's ICT demands;
- SU's ICT capabilities needed to be clustered into seven functional areas; and
- the IT Division should follow a shared model to deliver these capabilities (see Figure 46 below).

This will enable the institution to start collaborating on ICT initiatives emanating from and driven by actual needs, but at the same time aligned with the greater ICT portfolio of projects, which would result in less technical debt, inefficiency and rework.
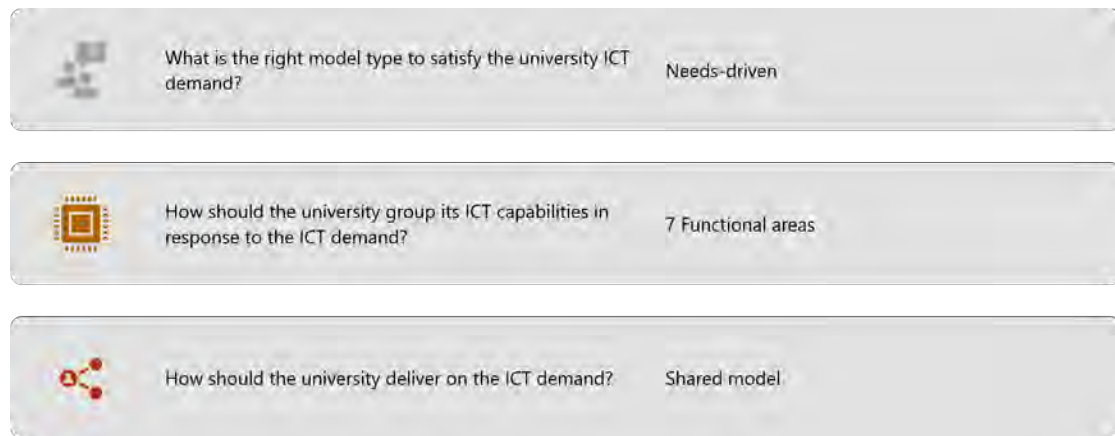
	What is the right model type to satisfy the university ICT demand?	Needs-driven
	How should the university group its ICT capabilities in response to the ICT demand?	7 Functional areas
	How should the university deliver on the ICT demand?	Shared model

Figure 46: Information gathered during the SDMR

A needs-driven ICT organisation is defined as an ICT provider that can meet its clients' needs at an institutionally acceptable pace, adhere to its own quality standards and achieve affordability by deploying its resources efficiently, while also ensuring that its service offerings are accessible, affordable and of an acceptable quality for the University. The benefits of a needs-driven ICT organisation are that it:

- enables market-relevant and competitive ICT services, allowing the consumer to select the required service quality based on the class of service required for the identified need;
- allows for the continuous realignment of ICT services with what is relevant and required by the University and the ICT industry;
- distinguishes between core and domain ICT services so that services that are no longer relevant to the organisation may be identified, matured or phased out;
- ensures that the client is clearly defined and that value created can be validated and measured;
- views ICT providers as organisational value owners instead of service, product or capability owners;
- aligns all ICT providers with the same service delivery model, while remaining relevant to the respective divisions or faculties so as to meet the University's needs;
- ensures that ICT resources are deployed to meet the University's needs;
- enables an ICT strategy to create and maintain an ecosystem relevant to the current and future needs of the organisation and industry;
- enables all ICT participants to subscribe to the same ICT mandate; and
- creates a culture of collaboration.

In response to the ICT demands, a capability model was designed. A capability model describes the complete set of capabilities that an organisation requires to execute its business model. SU's ICT capabilities were grouped into seven functional areas, as shown in Table 3 below.

Table 3: Description of the functional areas of ICT capabilities

Enterprise	Transform, support and continuously improve ICT organisational service offerings and products by delivering change at the right speed for the organisation, utilising techniques where applicable, enhancing the end-customer experience, while delivering on the organisation's strategic goals and outcomes.
Information	Build a world-class data-led organisation, generating organisational insights from well-managed data assets, while building trust and confidence in the data through proactive data governance.
Technology	Align ICT strategies, managing them throughout their lifecycle to ensure they consistently perform in accordance with customer expectations, and deliver organisational value at a competitive price.
Partner	Own the relationship with the University and respective organisational unit to ensure alignment with and support for the unit's strategy and outcomes.
ICT risk	Protect the organisation's technology and, ultimately, the organisation itself from exposure to information breaches and cyberattacks, thereby minimising operational and reputational risk. Develop and deliver a consistent set of risk frameworks and activities, demonstrating effective risk management in line with executive and regulatory expectations.
ICT strategy, architecture and innovation	Define the ICT strategy, manage the target architecture and provide direction on workforce needs, investments, sourcing and ecosystems to go from ideation to realisation of the technology vision as a community.
ICT talent management	Define a robust talent strategy for the IT Division, maintaining an appropriate talent pool that supports the University's ever-changing use of technology and ways of working, and develop leaders of the future that will deliver on the organisation's objectives and achieve the technology vision.

Finally, a shared model for meeting SU's ICT demands was designed. The model entails the centralisation of selective ICT functions, governance and resources (such as people, processes and technology) at the organisational level, while some divisions and/or faculties will directly participate in and help develop the function by allocating resources as needed. The primary reasons for opting for a shared model are that it:

- deploys resources (people, processes and technology) according to the level of participation selected by a particular division or faculty;
- enables the University to deliver capabilities in a structured way across the institution, yet still according to the requirements of the entity where the need initially arose.

The shared management model will enable all ICT participants to collectively define the standards, policies and procedures, and how the offering will be developed over time. The identification of which capabilities are to be managed centrally and which are to be matured collectively will form part of the implementation phase of the project.

4.3.1.1 Implementation of new service delivery model

The implementation phase of the service delivery model will commence with four projects, namely:

- the ICT service delivery model;
- project delivery capability;
- architecture and integration; and
- ICT risk improvement.

Each of these projects is required to set up a "guild"[9] (or core planning team). The guilds, in turn, are responsible for setting guardrails.[10] The respective projects are aimed at highlighting and addressing current challenges, defining the project scope, improving decision-making and enhancing service delivery. The four projects are summarised below:

ICT service delivery model

Challenge	Shortcomings in the IT service delivery review
Addressing the challenge	Build a project group (guild) to start the process of defining the new service delivery model
Scope	Implementation of the ICT target operating model Functional area to be established, and capabilities and processes defined Functional-area RACIs[11] to be defined Functional-area service level agreements and corresponding key performance indicators to be defined Functional area to establish its relevant ICT policies Implementation of the ICT organisational structure to support the operating model Reporting lines as well as guilds to be defined Transformation of the ICT organisation to the target operating model (TOM) Establish a new collaborative way of working
Decision-making	N/A
Service delivery	N/A
Functional area	N/A
Dependency	ICT architecture and strategy need to be set in order for the TOM to be aligned with it.

Project delivery capability

Challenge	ICT projects are often delivered late, exceed the budget, and have little perspective on technical debt. Therefore, SU has no consolidated view of IT and often encounter integration challenges.
Addressing the challenge	The University's current project delivery maturity is low. This creates a high level of risk given the large number of ICT-related projects that are either under way or being planned.
Definition	The development of the University's project management methodologies and standards will be led by the ICT technology functional area in consultation with the divisional and faculty ICT functions.
Decision-making	Decisions will be made by the relevant project steering committee, with an appropriate level of engagement to ensure alignment with other projects and relevant ICT functional areas. The ICT technology functional area will lead the alignment of requirements.
Service delivery	The ICT technology functional area will build some project delivery capability to support key projects, but the majority of service delivery capabilities will be sourced directly by the project.
Functional area	Technology
Dependency	To derive optimal benefits from this project, it should run parallel with the (i) strategy and architecture as well as the (ii) integration enablement projects. The former is expected to create significant improvements to the University's ICT architecture, which is currently the root cause of many of the challenges experienced. The latter will help define and implement integration patterns, standards and guardrails.

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[9] A "guild" is a group of ICT stakeholders from across the University with shared interests and the desire to share and grow knowledge and practices.

[10] Guardrails are policies, procedures, standards and guidelines that articulate the rules of engagement for the ICT capabilities.

[11] RACI stands for responsible, accountable, consulted and informed. It is used for clarifying and defining roles and responsibilities in cross-functional or departmental projects and processes.

Architecture and integration

Challenge	Enterprise and domain architecture capabilities are currently delivered by central IT, with a low level of maturity.
Addressing the challenge	The University's current architecture maturity is low. This creates a high level of risk given the implementation of SUNFin and SUNStudent. By not articulating the architecture, the technical debt and total cost of ownership are currently unknown and unmanaged.
Definition	The development of the University's architecture methodologies and standards will be led by the ICT strategy, architecture and innovation functional area, in consultation with the divisional and faculty ICT functions.
Decision-making	Decisions will be made by the relevant architecture practice, with an appropriate level of engagement to ensure alignment with other projects and relevant ICT functional areas. The ICT strategy, architecture and innovation will lead the alignment requirements.
Service delivery	The ICT strategy, architecture and innovation functional area will build the capability to support key projects as well as the organisation itself. However, the majority of service delivery capability will be sourced directly by the project.
Functional area	ICT strategy, architecture and innovation
Dependency	ICT strategy

ICT risk improvement

Challenge	According to the 2019 Deloitte report, "[t]he current level of cyber-capability is far too low (immature) and significantly significantly raises the risk of the University being subject to serious information security incidents".
Addressing the challenge	The University's current cybersecurity maturity is low. This creates a high level of risk given the general level of cyber-related criminal activity, and the large volumes of sensitive information that the University needs to protect.
Definition	The development of the University's ICT information security strategy and relevant policies and standards will be led by the ICT risk functional area, in consultation with the divisional and faculty ICT functions.
Decision-making	Decision-making will need to be collaborative, given the interrelated nature of cybersecurity, within guardrails.
Service delivery	Cybersecurity services will be delivered through a combination of the IT functions in the different divisions and faculties, along with the ICT risk functional area (centralised maturity).
Functional area	ICT risk
Dependency	ICT architecture and strategy needs to be set for the data architecture to be aligned with it. Project delivery capability to ensure integrated and managed approach is followed to the roll-out of the service delivery model.

The process has been designed as a holistic engagement with the broader ICT function to ensure a collaborative approach. It can serve as a channel for launching strategic initiatives, defining the technical requirements for a project, helping to analyse business requirements, or obtaining advice on initiatives with an ICT component. The process will not only address the challenges of the architecture practice and project capability, but also offers opportunities for further improvement, as shown in Figure 47 below.

Figure 47: Engagement model of the SDMR

For the architecture practice, the Open Group Architecture Framework architecture development method (TOGAF[12] ADM) will be used as best-practice framework to develop and implement information systems, processes and structures led by the ICT strategy, architecture and innovation project. The ADM is a reliable way of developing and using enterprise architecture at different levels (business, security, application, data, technology) to ensure that a complex set of requirements are adequately addressed and a set of guidelines and techniques for architecture development are compiled.

4.3.1.2 Implementation and support of institutional service management platform

This platform is required to enable service and workflow management for all service units across SU. The implementation of this system will enable improved service management maturity and performance management. It will also enhance operational efficiency by means of intelligent routing of service requests, incidents, problems and change requests.

The IT Division has successfully developed and implemented the platform for its own use, using divisional funds and resources. This has enabled the Division to implement transparent work processes (according to the ITIL framework),[13] efficient workflow management and service quality controls. The IT Division views the platform as a strategic enabler for continuous service improvement. The platform creates an opportunity to enhance cross-functional collaboration and improve interrelated business processes. The productivity improvements achieved are expected to save valuable service delivery resources, which could potentially be utilised in the broader ICT function.

The implementation of the institutional service management platform supports core strategic theme 6, "A thriving Stellenbosch University". It raises the standard of SU's facilities and infrastructure to those of a world-class research-intensive university, embraces visual redress, and brings about sustainable change in all facets and functions of SU so that the institution can be agile, adaptive and responsive. The focus is on improving the user experience and adopting strategies to improve collaboration and mobility of services.

Redefining the processes ensures continuous service improvement based on collaboration between cross-functional ICT business processes and services across the University. These

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[12] https://www.opengroup.org/togaf.

[13] The Information Technology Infrastructure Library™ framework, being a set of detailed practices for IT service management that focuses on aligning IT services with the needs of business.

partnerships will ensure that business processes can be measured, adapted and implemented through tailor-made workflows.

Since the platform went live in September 2018, the business processes have been systematically reviewed and improved. The benefits of the service management platform are twofold. From an internal IT Division perspective, it ensures increased IT efficiency and productivity, support to address compliance challenges, visibility as well as understanding of IT service processes. From an institutional perspective, it ensures a better understanding of business needs, higher IT service availability levels, increased value and cost efficiency, and the ability to reduce the impact of incidents on business. Yet this approach requires discipline, a redefinition of ways of working as well as change management, as shown in Figure 48 below.
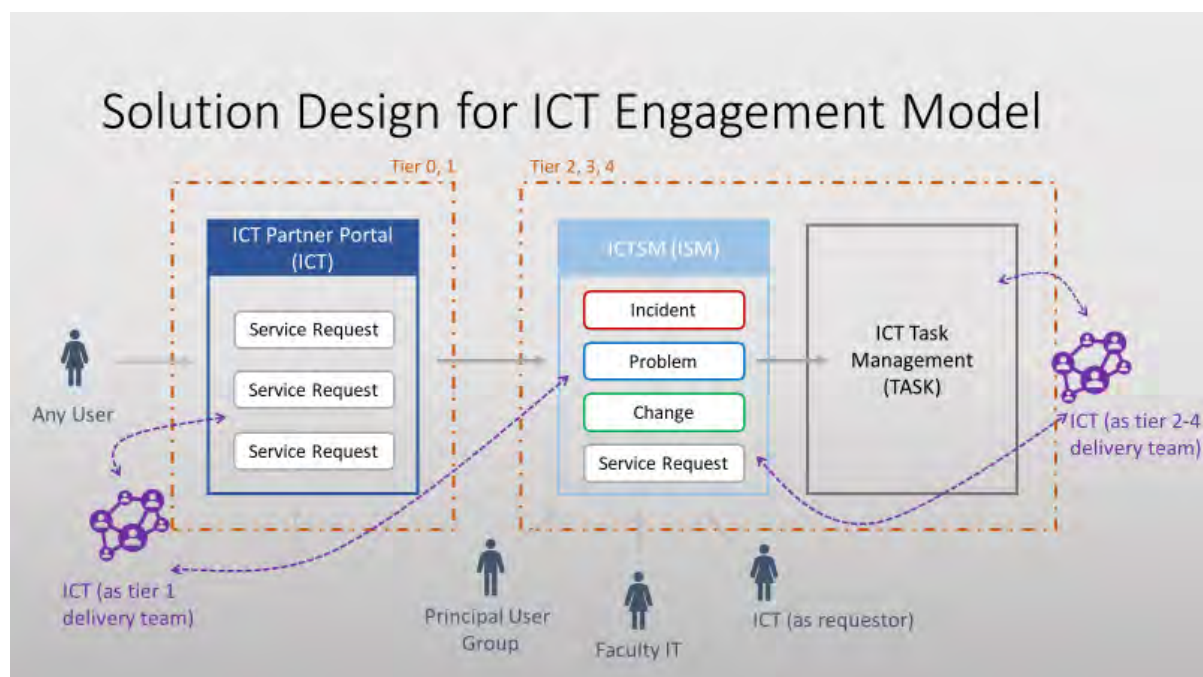

Figure 48: *IT service management solution design*

The ICT partner portal is the customer-facing service desk, which is accessible to any stakeholder, both internal or external to the University. The ICT service management (ISM) service desk has been designed to streamline the workflow between the internal IT teams, address inefficiencies and improve collaboration.

4.3.2 Institutional software solutions (ISS)

The mission of the Institutional Software Solutions (ISS) Section of the IT Division is to build, provide, maintain and support reliable, innovative and sustainable institutional software solutions that meet the University's needs timeously and in the long term.

These software solutions include the mission-critical information systems, or systems of record, that the University depends on to execute its mission and strategy. The portfolio of solutions includes the student information system (SIS), the financial information system, the human resources management system, the research administration system, various facilities management systems and business intelligence systems.

The current SUNFin and SUNStudent projects, which are aimed at replacing the legacy SIS and financial systems and driving the digital transformation of the institution, have potentially profound implications for the ISS Section. This is because the new systems require

the organisation to transition from one that traditionally developed and ran the University's bespoke solutions, to one that will increasingly broker, implement, assimilate and integrate commercial, cloud-based services and solutions. This transition will require new skills and capabilities, role changes and reorganisation. However, it does also offer potential for ISS to provide stronger support to the University's academic mission in the future. To successfully implement SUNFin and SUNStudent, ISS has already reorganised into an interim, project-focused structure.

For these reasons, and especially considering the required change in business processes, functional roles and ways of working, both projects have significantly invested in organisational change management facilitation as part of project implementation.

4.3.2.1 SUNStudent implementation project

SUNStudent involves the implementation of a new SIS to replace the legacy Adabas-Natural SIS in order to help propel SU into the digital age and create a flexible, modern, student-centric yet solid SIS. An SIS supports the core institutional capability to administer and manage the lifecycle of all students, and to administer the curriculum and student finance and accounts. As such, an SIS is a system of record. Such systems are typically renewed every 15 to 20 years. The renewal was motivated for in 2013 and secured Council funding in 2014.

On 8 October 2018, the Rectorate approved the tender committee's recommendation of an SIS SaaS[14] and a vendor/implementation partner following a rigorous and thorough tender process. An IT-facilitated request for proposal (RFP) was issued to the three shortlisted vendors. Intensive five-day workshops with each vendor were conducted in May and June 2018, during which over 250 SU stakeholders could assess the demonstrated functionalities of the SIS solutions. This was followed by a dialogue RFP process, during which negotiations were conducted with each vendor in parallel, after which the tender committee evaluated the best and final offers. The tender committee's recommendations were then escalated through the SUNStudent and systems renewal project steering committees, and the Technology and Information Committee (TIC), until the Rectorate finally approved the recommendation.

Contracting was completed by May 2019, after which implementation of the Academia cloud service with the selected vendor, Serosoft, and implementation partner Eiffel Corp commenced. The implementation will take approximately two years, with phased go-lives expected in 2021. At present, functional stakeholders are engaged in intensive blueprinting workshops facilitated by Serosoft, spread over six months.

The project is a collaboration between the Registrar, being the principal stakeholder, SIS Support (SISS) in the Division of Information Governance, IT (ISS) as well as other important stakeholders such as Student Access, Student Fees and faculties, among others.

4.3.2.2 SUNFin implementation project

SUNFin involves the replacement of the legacy Adabas-Natural financial system, which is also a system of record. It followed a similar trajectory to SUNStudent. A formal tender (RFP) was issued in August 2018 to three commercial vendors with four solutions. The Finance Division, IT (ISS) and other stakeholders such as faculty managers conducted a rigorous tender evaluation process to select the Oracle Financials Cloud service, with Visions

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[14] Software-as-a-service – a "cloud" system.

Consulting as the implementation partner. After approval by the steering committees, the TIC and the Rectorate, contracting was completed in February 2019.

The implementation project commenced on 1 April 2019, and SUNFin is anticipated to go live in January 2021. Intensive "cloud process alignment" workshops were completed by July, and the project team is on course for the first iteration (prototype) implementation.

SUNStudent and SUNFin will have certain implementation interdependencies, such as those concerning student fees. Synchronisation of the respective project schedules will present a challenge, with SUNFin being further along towards go-live. In addition, significant process and data integration with the rest of SU's information ecosystem is required, which poses a major challenge to ISS's integration capability.

The fact that ISS is heavily engaged in the SUNFin and SUNStudent projects has not prevented a constant and burgeoning demand for more software solutions as professional and support divisions and faculties pursue their digital plans in support of SU's strategy. This lack of coordinated, integrated institutional planning and strategic prioritisation may put ISS and the entire IT Division in an untenable position as SUNFin and SUNStudent approach crucial milestones.

Simultaneously, ISS has had to continue the process of eliminating so-called technical debt to mitigate emerging licensing, platform and security risks. An example is the migration of the multiple web applications to a new platform as well as the migration of all web services – fundamental building blocks for system integration – that is currently under way.

Other significant developments and implementations are briefly reported on below:

4.3.2.3 SUN-e-HR human resources management system

In collaboration with the HR Division's systems team, the Oracle e-Business Suite that underlies SUN-e-HR was successfully upgraded to the then latest version (12.2.7), together with the implementation of the latest-release upgrade pack, to prepare for the 2019 tax year end. The 2019 year-end processes were finalised by early June 2019, ahead of the SARS e-filing date of 1 July.

The e-Business Suite was also extended to allow for the maintenance of temporary hourly worker's leave balances, also enabling leave applications through self-service.

Currently, HR reports are being developed on Oracle Business Intelligence Enterprise Edition, with some already released for use.

4.3.2.4 Student fees and financial aid systems

The Student Account Adabas-Natural subsystem[15] was modified to comply with the National Credit Act for student loan repayment. Moreover, integrations with government's NSFAS service were developed and are continuously refined to enable the Bursaries and Loans Office to better manage NSFAS awards.

4.3.2.5 Alumni and donor relations systems

DevMan is a commercial SaaS aimed at renewing the legacy donor strategy solution of the Development and Alumni Relations (DAR) Division. It enables DAR to manage and cultivate SU alumni and donors, and conduct fundraising more effectively.

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[15] It should be noted that systems such as these are planned to be replaced by SUNStudent and SUNFin.

Implementation, which involved DAR, IT and the selected vendor, commenced in 2017. Phase 2 went live in October 2018 and allows for data exchange between DevMan and SIS. Integration with the legacy financial system was completed in 2019.

4.3.2.6 Facilities management systems

IT (ISS) was only partially involved in the implementation of the Tridium building management system subsequent to the implementation of the computer-aided facilities management system Planon in September 2018. Through this process, ISS developed integrations with the financial system, among others.

4.3.2.7 SUN-i business intelligence system

ISS and the Division of Information Governance (IG) collaborate to develop and maintain business intelligence and reporting dashboards, data warehouses and tools, collectively known as SUN-i, on a continuous basis. In 2019 to date, the following joint projects were completed:
- Staff analytics phase 2
- Bursaries and loans analytics phase 2
- HEMIS reporting via SUN-i for student records and space utilisation
- Student fees analytics phase 1
- Postgraduate admissions analytics

4.3.2.8 Research contract management system

In partnership with the Division of Research Development (DRD) and an external software vendor, phase 1 of the research contract management system went live in September 2018. The system enables DRD to manage and administer the large volume of research contracts effectively and efficiently. Phase 2 is currently under way and involves reporting tools and closer integration with the financial and budgeting (IDU) systems. The system is being developed to meet both legal and audit compliance requirements, to improve reporting and to allow for better management of the third income stream.

4.3.2.9 Facilitating the institutional adoption of Office365

ISS plays a major role in helping SU staff adopt the evolving suite of digital collaborative and communications tools in Office365 by facilitating workshops with various environments. This year to date, 20 such workshops have been hosted, with an average of ten people per workshop. The improvement in personal and team productivity enabled by the suite should not be underestimated. The workshops aim to create "champions" who could then further drive adoption in their respective environments.

4.3.3 Academic ICT support

The Academic ICT team provides a strategic and advisory function to academic, research and professional support services partners in identifying and selecting relevant, effective technology solutions to meet their needs. The team was established in 2015 as part of refocusing the ICT service effort on SU's core functions of research as well as learning and teaching, and started out very small. They started rendering support to the Social Impact Division and International Office soon thereafter.

The role of the team is to facilitate the delivery of high-quality, integrated and adaptive ICT solutions that enable and empower our stakeholders to achieve excellence in learning,

teaching, research and social impact initiatives. This is done in collaboration with the other IT teams and PASS divisions. Academic ICT guides its partners through the process towards adopting fit-for-purpose solutions.

The team is guided by the priorities stated in Vision 2040 and Strategic Framework 2019-2024, and particularly core strategic theme 6, "A thriving Stellenbosch University". The team works towards operational excellence, whilst ensuring sustainability.

The ICT commons concept is at the core of most of the team's work. The ICT commons can be defined as a collection of ICT infrastructure, software licences and services provided and funded at an institutional level to all SU academics. The services cater for the ICT needs of the majority of the academics, although not the specialised needs of individuals, departments or faculties. The commons should be available to academics at no charge to enable instead of inhibit the academic function.

The commons concept strongly supports the needs-aligned service delivery model recommended by the SDMR (discussed extensively above). This is because the commons is designed to provide for the infrastructure, licences and services that most academics need, as derived from extensive consultation with the academic community. In this regard, the COO recently urged SU senior leaders in all responsibility centres and all faculties to work with him and his colleagues as they define and implement a "commons for ICT at SU", underscoring the importance of the ICT commons for SU academics.

The current Academic ICT team comprises only five full-time, permanent staff, of whom only three are funded from the IT staff budget. Since the role of the team is largely facilitation, the rest of the IT Division as well as other PASS divisions are relied on to deliver most of the infrastructure and services. To achieve the most with limited resources, the team has been focusing on standardising and improving processes. In this regard, the new service management system recently implemented by the IT Division has significantly contributed to establishing a standard engagement model.

In spite of its small size, the team has made considerable progress in delivering the commons through a series of projects. Progress is discussed below according to the two sections of the team, namely (i) research, social impact and internationalisation, and (ii) learning technology systems.

4.3.3.1 Research

A major consultation, needs assessment and planning process has been undertaken by the ICT in Research strategy task team to prepare a strategy document. Unfortunately, the document was referred back, and the task team is now awaiting the completion of the SDMR before resubmitting the strategy for approval. However, three of the more urgent elements are progressing, albeit within the constraints of the small team and current budgets:
- **Storage**: New network storage has been purchased (Infrastructure team) and planning and testing of cloud storage is in progress.
- **High-performance computing** (HPC): A replacement for the HPC2 cluster has been ordered. This is largely funded by researchers, but with R1,5 million support from IT, and forms part of growing the research commons.
- **Network**: Network upgrades are in progress, and systems for high-speed, high-volume data transfers are being tested (Infrastructure team).

The projects taken on by the team in response to requests from academic departments are project-managed by IT on behalf of the academic owners. The research-related projects may

be linked to the research lifecycle to explain the context and purpose of the work (see Figure 49 below).
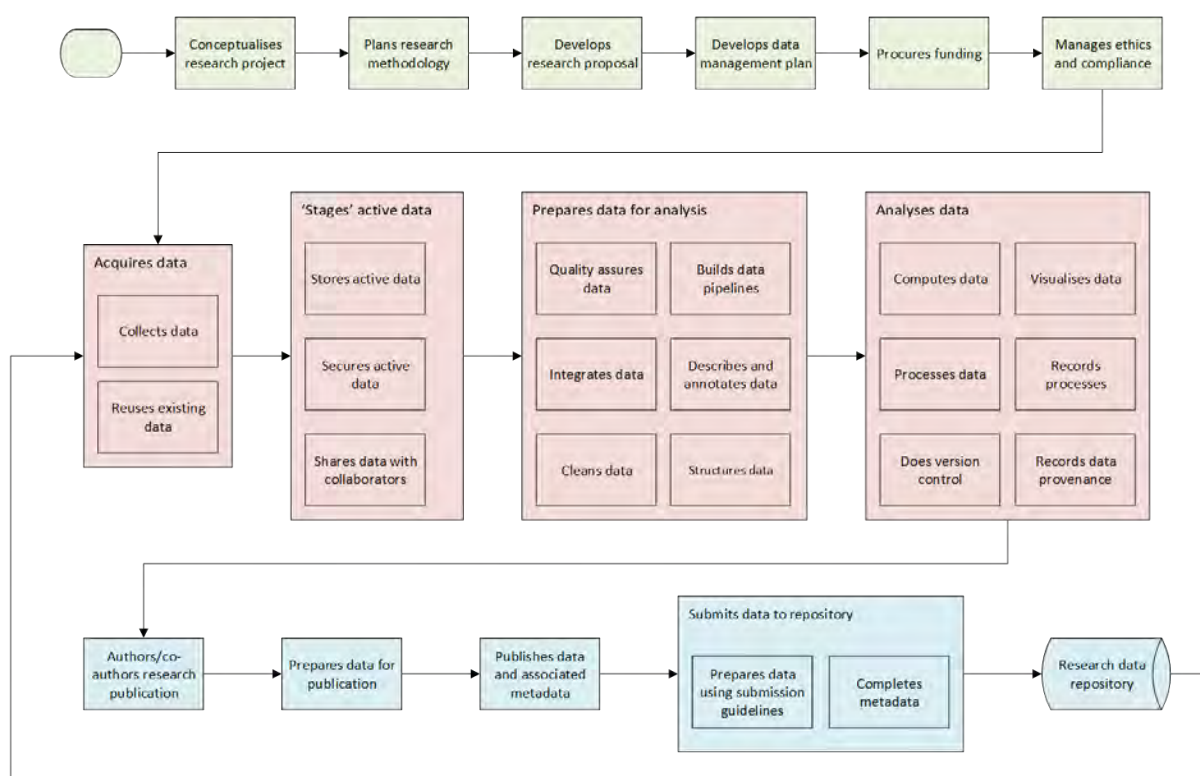

Figure 49: The research lifecycle

(i)   **Research contracts solution (governance):** The IT Division in collaboration with accredited Microsoft Partner SIS Global and the DRD Research Contracts team coordinated the implementation of a research contracts solution on the Microsoft Dynamics platform. Based on the outcome of a data security audit, multifactor authentication (MFA)[16] was implemented as an advanced security mechanism. The second phase of the research contracts project – integrated reporting – started in 2019.

(ii)   **SUNScholarData (research preservation and sharing: research data repository):** The IT Division collaborated with the Library and Information Service to implement SUNScholarData, an institutional research data repository on the Figshare platform. The IT Division also collaborated with the South African Identity Federation (SAFIRE) to enable federated identity management (FIM)[17] for this solution.

(iii)   **Omeka (research preservation and sharing):** The IT Division collaborated with research groups such as the Transformation Research Unit (TRU) and the Africa Open Institute for Music, Research and Innovation to explore the Omeka open-source online digital collection system as a fit-for-purpose content management solution.

(iv)   **Office 365 Groups:** The IT Division collaborated with research groups such as ISEM to explore Office 365 Groups as a fit-for-purpose collaboration and content management solution.

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[16] A security system that requires more than one method of authentication to verify a user's identity for a login or other transaction.

[17] The means of linking a person's electronic identity and attributes stored across multiple distinct identity management systems, enabling the user to use the same identification data to obtain access to multiple networks.

(v) **REDCap (active research: acquire data):** The IT Division has taken up the maintenance and application support of the institutional SU REDCap platform and infrastructure. This function was previously carried out informally by a small team of volunteers from the Division and the Faculty of Medicine and Health Sciences, who provided a best-effort application support service by way of redcap@sun.ac.za.

4.3.3.2 Internationalisation

(i) **INTERINFO:** The IT Division facilitated an analysis to specify the requirements for SU International's envisioned integrated information system for internationalisation (INTERINFO). The ICT Business Analysis team will identify potential solutions and select an implementation partner later this year.

4.3.3.3 Social impact

(i) **Student volunteerism solution (social impact):** The IT Division facilitated an analysis to specify the requirements for the Division of Social Impact's envisioned student volunteerism solution. The ICT Business Analysis team will identify potential solutions and select an implementation partner later this year.

4.3.3.4 Learning technology systems

The focus of the team is on providing a strong and reliable set of core services. These services should enable the development of a next-generation digital learning environment (NGDLE) that supports staff and students in creating an ecosystem for learning. In addition, standard operating procedures have been agreed between the IT Division, the Centre for Learning Technologies, faculty IT managers and the blended-learning coordinators. This has improved efficiencies and service delivery.

The Academic ICT team has achieved considerable systems synergy: Three systems have been built on the same Moodle open-source platform, benefiting from a common integration code and simplifying support. These systems are SUNLearn, SUNOnline and Student Feedback. In addition, the co-curriculum competency framework is also running on SUNLearn.

SUNLearn is SU's core learning management system. It offers mobile off-line support, which allows students to download content on campus and then continue to work without requiring an internet connection. Improvements made to SUNLearn over the past year include a Moodle version update, an improved year-to-year module update (rollover) and a refreshed look and feel for 2020 (still in progress).

Preparations are under way to implement analytics that will also allow better student tracking. An integration rewrite is in progress that will ensure better information exchange between SUNLearn and the student information systems – both the current one and SUNStudent.

(i) **SUNOnline online short-course system:** A new, bespoke online short-course system was developed and rolled out in collaboration with Innovus, the Academic ICT support team, Learning and Teaching Enhancement, and faculties. This complex project required many integrations between existing, bespoke short-course administration systems, the legacy SIS, and the Moodle-based learning management system branded as SUNOnline for this purpose. The project made significant use of the Oracle Fusion SOA suite ("middleware") acquired in 2015 under the now-completed systems renewal project. SUNOnline offers online self-registration and payments, and a unique,

commercial learning management system platform for staff and participants in short learning programmes.

(ii) **Student Feedback:** Student Feedback is a feedback system that allows students to provide anonymous feedback on their courses and lecturers.

(iii) **Co-curriculum competency framework:** Participation in the co-curriculum has been identified as one of the ways in which the SU community can meet the strategic goals of a transformative student experience and a networked and collaborative teaching and learning environment. The co-curriculum offers students and staff various opportunities to develop skills and competencies linked to the SU graduate attributes in preparation for entering the workforce as SU alumni. The University is proud to be one of the very first higher education institutions worldwide to offer an objective and measurable co-curriculum competency framework, which runs on SUNLearn. This system has been developed by the Academic ICT team and the Centre for Learning Technologies for use by the Centre for Student Leadership and Structures. It enables lecturers and facilitators in registered academic courses and co-curricular courses to assign competencies to specific activities. Students can attach evidence of the work they have done to meet these competencies within a learning plan, which can then be linked to their particular degree. The competencies that have been completed by each student will be added to their academic transcript on graduation via a process run by the Co-Curriculum and Registrar's offices.

(iv) **SUNStream**: This system is used to livestream course sessions, while students can review the video material when and where they wish. The system is stable, and usage is expected to increase. Infrastructure changes are being planned to ensure that this increase can be accommodated.

(v) **Placement Plus:** This platform for the Faculty of Medicine and Health Sciences manages the complex system of placing the Faculty's students and scheduling training in small groups distributed across many locations, while ensuring curriculum management and alignment. The complexity arises from the many locations, involvement of non-SU staff, use of non-SU locations and the vast number of sessions. The development was outsourced yet facilitated by the IT Division. IT has also integrated the system with the relevant SU systems.

4.3.4 *Infrastructure services*

IT's Infrastructure Services Section delivers back-end services based on the industry standard stack of infrastructure-as-a-service (IaaS), platform-as-a-service (PaaS) and, to a certain extent, software-as-a-service (SaaS) (see Figure 50). Apart from the following services, this section also installs, operates and maintains all card and central camera systems.

The objectives of Infrastructure Services are to:
- create high-quality, sustainable infrastructure;
- provide WiFi everywhere;
- be agile in delivery and scale on demand;
- provide services within a hybrid of on-premises, off-premises, private cloud, public cloud configuration, depending on which is the most cost-effective;
- monitor systems to manage performance and availability; and
- increase support for research computing and infrastructure.

The aims of SU's card and camera security systems are to:
- support campus security and deliver intelligent video surveillance and secure card access systems;
- improve the student experience during registration; and
- develop and improve the exam and class attendance systems.

The aims of SU's network, data centres and internet are to:
- implement WiFi and internet access systems for visitors and conferences;
- enhance the network experience through various projects, including a set standard for 10 Gig feeds to all buildings, 1 Gig feed to wired endpoints, and WiFi in all buildings, including residences;
- enhance the video-conferencing experience by enabling integration between Skype for Business, Vidyo and Polycom units on campus and outside our network; and
- provide classroom WiFi.

The aims of SU's servers, storage and hosting are to:
- consolidate standalone servers in faculties and departments, and deliver a standardised service;
- develop a storage strategy to deliver affordable "big data" storage services;
- explore opportunities to deliver "cloud services", which will enhance agility and scale easily on demand, including storage and high-performance computing;
- provide dashboards to communicate system availability and health; and
- block servers and desktops with outdated operating systems due to the increased risk they pose.
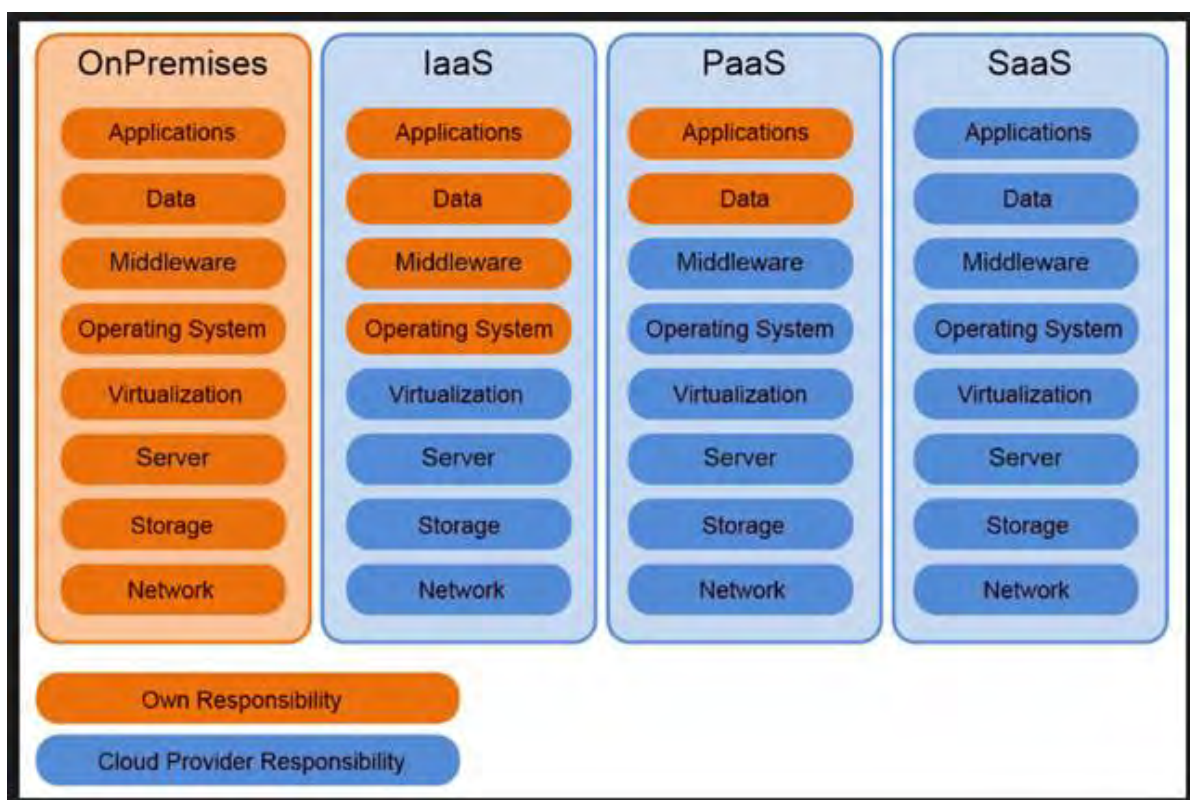

Figure 50: Infrastructure services stack

4.3.4.1 Network upgrade funded by ICT in Teaching and Learning project

This project addresses the physical network upgrade in buildings as well as the fibre network distribution between buildings.

At the start of the project, it was decided to align the ICT network and building infrastructure project with SUFM's projects (catch-up, CRP, maintenance, densification, etc.). While this was a good cost-saving strategy, it did however lead to slow overall project progress, which made completion by May 2019 – the envisaged deadline – impossible. The project has now been rescheduled to the end of 2020.

Current challenges pertain to person-power capacity at SUFM and IT, and access to buildings, which is often limited to holiday periods, as network installations cannot be carried out during classes and examinations.

4.3.4.2 Fibre network distribution routes

The major distribution routes have been completed. New routes to the south campus across the Eerste River are now in the planning phase. The strategy is to reach a point where any SU building can be accessed from two different fibre distribution routes. At present, this is only true for the major academic buildings, such as those containing computer labs.
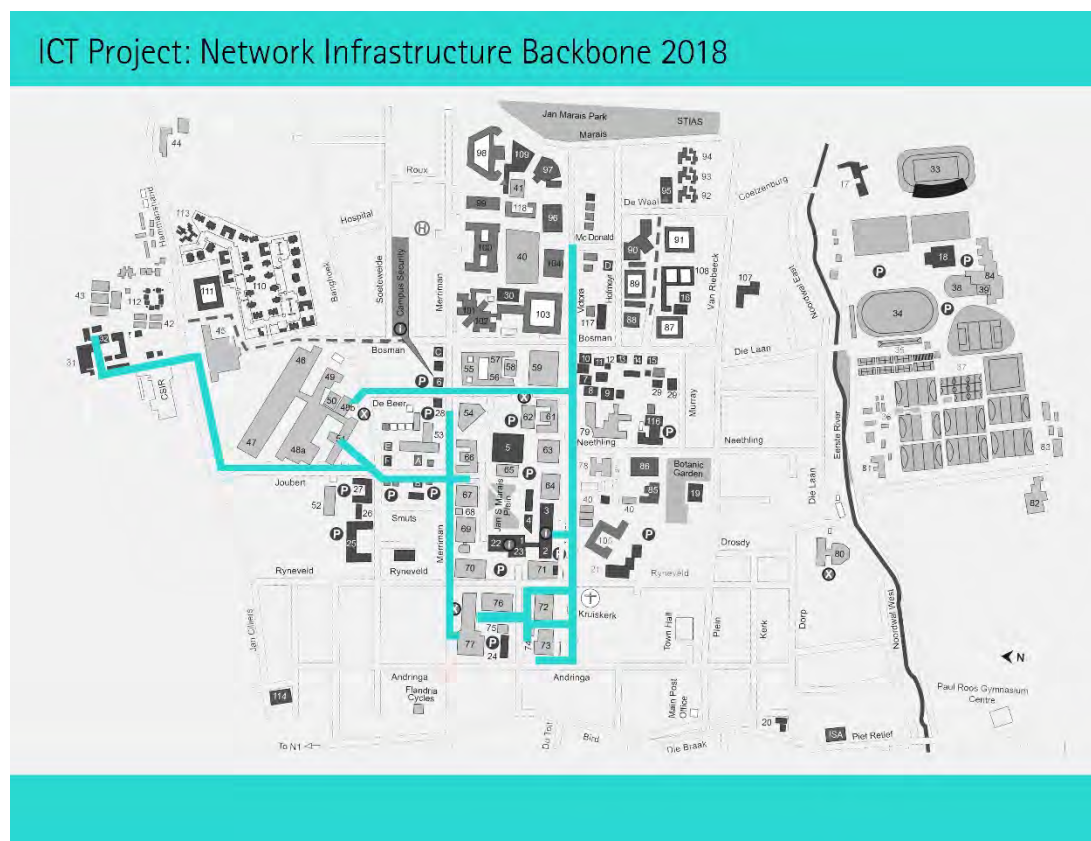

Figure 51: Upgrade to backbone network

4.3.4.3 Campus WiFi

The demand for WiFi in academic and administrative buildings as well as in residences continues to grow. This project is progressing well, as shown in Figure 52. In terms of residences, the plan is to complete installation in all residences by the end of 2019.

Figure 52 provides a visual representation of buildings with WiFi coverage, where red indicates less than 20% coverage, yellow coverage between 20% and 79%, and green more than 80% coverage.
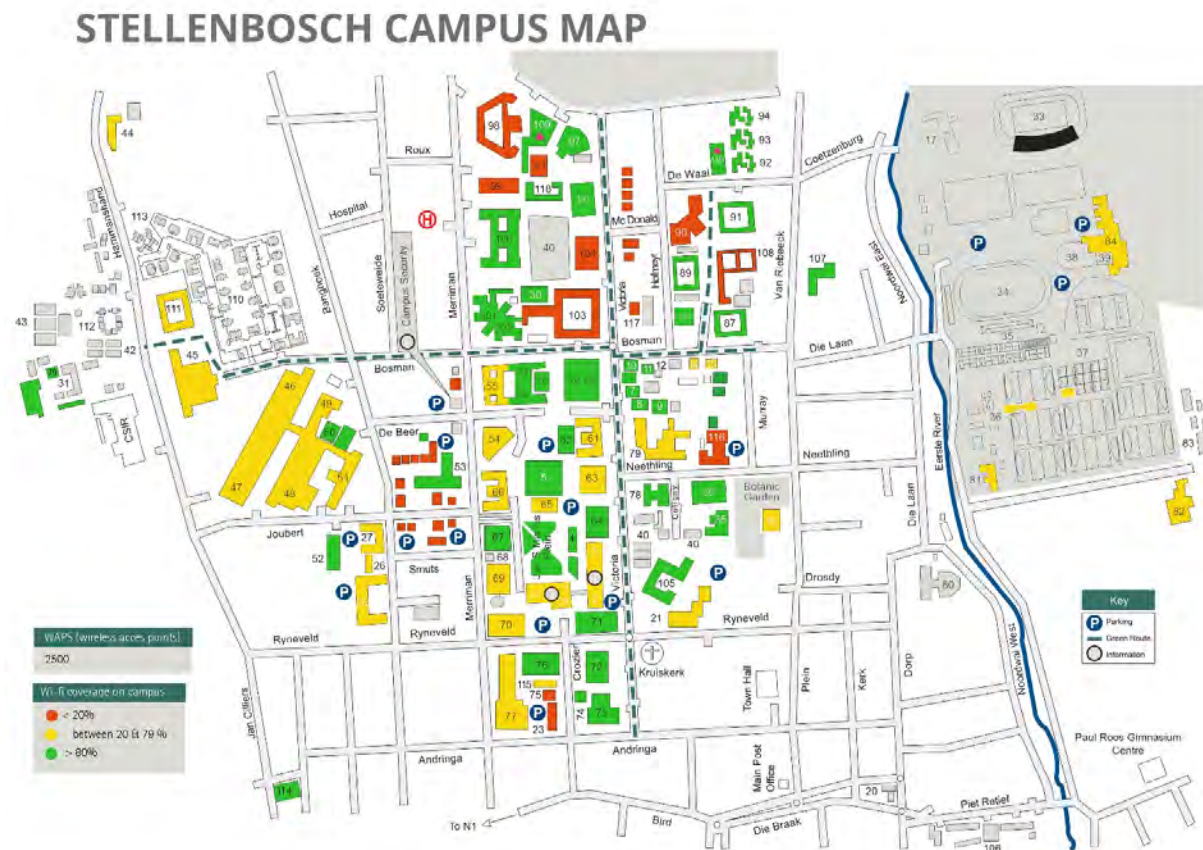

Figure 52: Stellenbosch campus WiFi coverage

4.3.4.4 Network upgrade in buildings – before and after

With the installation of the very first networks on campus, the explosion in demand in terms of bandwidth required and number of devices connecting to the network could never have been envisaged. Figure 53 below shows the original, "small" cabinets that were installed in buildings. To provide for further growth in demand and ensure availability and stability, new standards have been developed in line with international benchmarks. This resulted in the creation of one or more network rooms in every building, with capacity to extend so as to maintain the network as shown in figures 54 to 56.

Figure 53: Original network installation – difficult to maintain

Figure 54: New standards for cabling distribution channels in buildings – room for growth

Figure 55: *Large cabinets in central network distribution room for easier service access*

Figure 56: *High-quality cabling standards, delivering high network reliability and availability*

4.3.5 #InetkeyMustFall

4.3.5.1 Internet service funding model

The current internet service funding model is treated as a zero budget. This means that the full cost of the service is funded from the sale of data to users. Costs are recovered per megabyte of data. As technology changes, the complexities increase, such as who carries the cost of the data to and from the University's web services (www.sun.ac.za). With e-mail moving away from our local data centre to the Microsoft cloud service, another question pertains as to what happens to data cost recovery. Every day presents new challenges in

respect of who pays when, and how costs will be offset. A large cost is incurred in terms of staff and equipment to do the accounting and recover the costs against student accounts and departmental cost centres.

At the moment, SU is the only higher education institution in South Africa where staff and students need to pay for internet at the point of service. The request to centrally fund the cost of providing internet services has been submitted for the 2020 central budget.

4.3.6 Identity and access management systems renewal project

4.3.6.1 What is identity and access management?

Identity and access management (IAM) refers to a set of business processes and supporting technologies that enable the creation, maintenance and use of a digital identity. A digital identity is the unique representation of a subject engaged in an online transaction. Such an identity is always unique in the context of a digital service, but does not necessarily need to uniquely identify the subject in all contexts. In other words, accessing a digital service may not mean that the subject's real-life identity is known. As such, the impact of IAM on the SU user community, application portfolio and information resources is extensive. The IAM programme and its related services are responsible for the management of faculty, administrative and student information, access to SU applications and information, and the distribution of such information externally.

4.3.6.2 IAM as a strategic initiative

IAM ensures individuals' right to access the right resources at the right time for the right reasons. In simple terms, IAM authenticates users' identity, authorises certain users to access or perform certain roles (thus offering role-based access control) and protects personal information and digital identities. The roles that allow access are defined according to job competency, authority and responsibility in the enterprise, and are commonly mission-critical, allowing system administrators to regulate access to systems and networks.

At SU, IAM must become a business process framework that facilitates the management of digital identities. The development of such a framework for the University needs to be business-aligned and must include SU's policies on managing digital identities. Therefore, it requires business skills and not mere technical competence.

The challenge is to create a positive, welcoming user experience, and at the same time provide greater security in accessing digital assets and computer systems. The IAM capability must ensure that authentication and authorisation to gain access to information and systems can be achieved without lengthy processes and productivity losses.

4.3.6.3 Tenets for SU's IAM programme

(i) **Tenet 1: IAM has a huge impact on user experience.**
IAM affects everyone and everything. If implemented correctly, IAM should be simple and intuitive to end users. It is a core technical service that exists to ensure that only verified people access online resources and knowledge assets of the University via managed permissions. Without IAM, members of the SU community cannot easily access, provide access to or share information.

In an ideal scenario, IAM enables new applications and services to be called up quickly, provides necessary user information to applications to function properly, and allows users to utilise new services with minimal effort. The identity stores are central to IAM

and hold critical information about the identities and attributes of the University's internal and external user communities.

The IAM programme will reduce complexity for end users, application owners and people administrators. It will streamline identity and account creation for end users by eliminating paper-based, manual processes. It will offer end users insight in and control over their accounts through self-service account management, placing the control of basic requests – such as username creation, password changes and access requests – in the hands of the user instead of a helpdesk.

IAM services will allow users to select their preferred credential for access purposes and will reduce the burden of remembering all credentials of all the systems they use to work, study or collaborate. IAM efforts will boost productivity through quick provisioning, granting users access to protected systems, resources and physical locations with little to no intervention by administrative staff.

(ii) **Tenet 2: IAM protects University resources.**
IAM is a vital information safeguard. It exists to protect sensitive data and information from the ever-evolving landscape of security threats. If properly implemented, IAM solutions enable proactive security risk identification and mitigation, allowing the University to identify policy violations or remove inappropriate access privileges without having to waste time and effort searching across disparate systems. With IAM, SU will be able to easily confirm that proper controls and measures are in place, meeting audit and regulatory requirements.

(iii) **Tenet 3: IAM enables research and collaboration.**
The IAM programme will facilitate collaboration. It will break down the barriers to access for end users, enabling them to share information and work safely together across faculties and institutions. It will demand the implementation of standards, and will leverage these standards to federate decision-making with external systems.

The programme will lay the groundwork to carefully share identity information that enables access to resources that cannot currently be viewed by any other means. It will give the University a competitive edge over institutions that cannot offer the same level of ease and expediency. This should entice students and faculty to come to or stay at SU to study and conduct research.

(iv) **Tenet 4: IAM supports systems renewal and cloud services.**
IAM increases the agility of application development and deployment by eliminating the need for application developers to reinvent and duplicate potentially vulnerable authentication systems. It also removes the need for application owners to manage such duplicate systems. It can help SU weather the storm of disruptive innovation, including positioning the University to quickly and securely integrate with or implement cloud platforms and services.

IAM enables, and is an important precursor to, key SU technology initiatives. SUNStudent, SUNFin and the learning management ecosystem all rely on sound IAM process re-engineering, design and implementation to deliver improved services to the end-user community.

4.3.6.4 What is the vision of the IAM programme?

The IAM programme seeks to enable and support networked and collaborative teaching and learning, research and partnerships by providing secure, governed and convenient access to

the required digital services and assets, across institutions, within institutional policy and quality parameters.

4.3.6.5 The IAM programme schedule

An RFP to appoint a business partner to help the IT Division develop the IAM programme is expected to be issued in the next few months. The immediate next phase will be to schedule and execute the implementation of the different projects arising from the IAM programme. The project timeframe will be three to four years. Urgent functions required for current projects (SUNFin and SUNStudent) will be expedited and implemented as required.