UNIVERSITY OF JOHANNESBURG

2020 INFORMATION COMMUNICATION SYSTEMS Annual Report

The Future Reimagined

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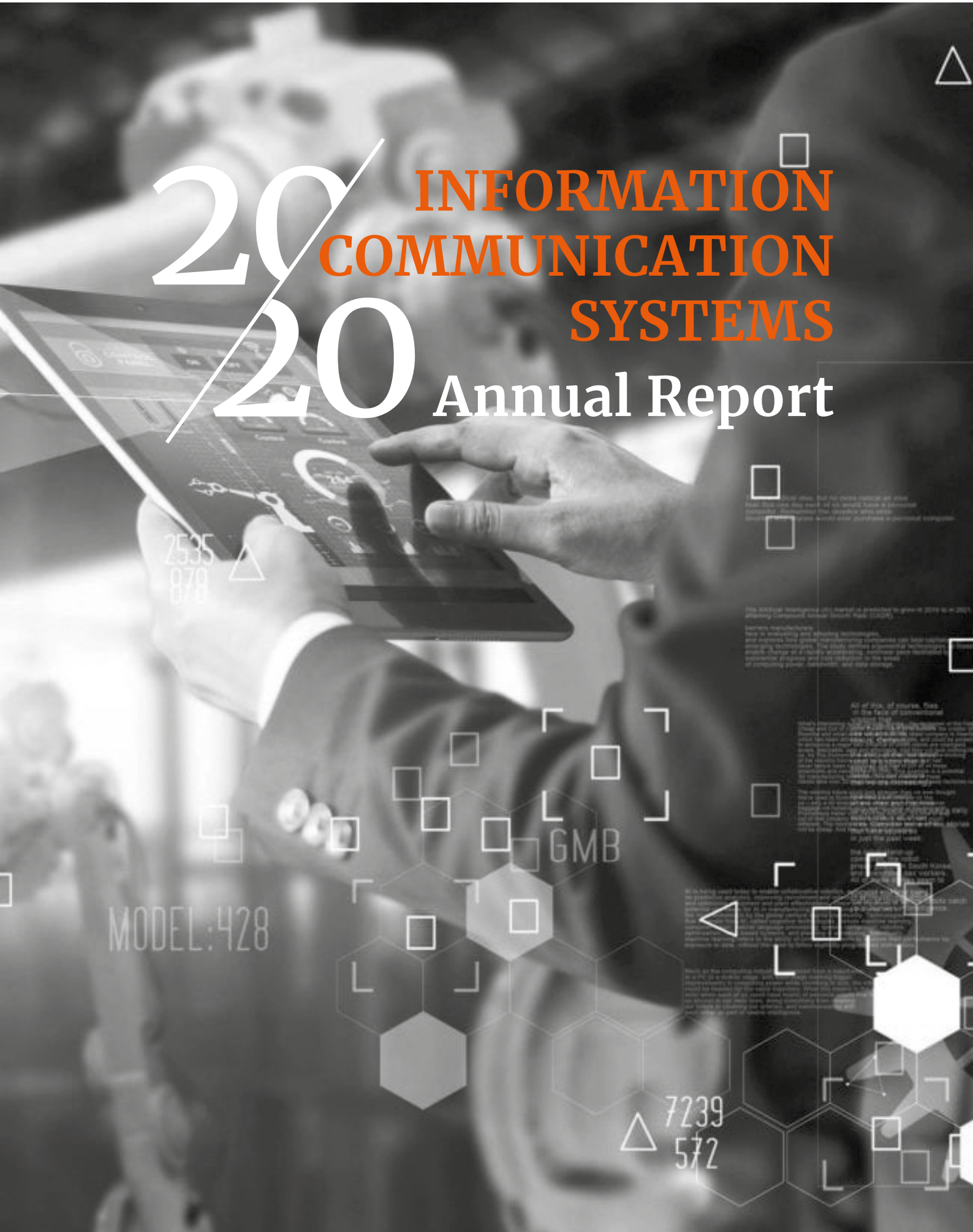


2020 INFORMATION COMMUNICATION SYSTEMS Annual Report

OVERVIEW

The Information Communication Systems Division (ICS) is the internal Information and Communication Technology (ICT) Service Provider to the University of Johannesburg (UJ), and the institution's central ICT Division. It has the task of dispensing enterprise ICT systems and services for all UJ staff, students, and partners; this is done through efficient and effective planning, implementation, and support for ICT innovations.

With responsibility to take on digital transformation and other business critical projects, the role of the ICS is more visible than before. Between maintaining infrastructure, coming up with new ways to use information and data to drive business forward, and leading digital transformation efforts, ICS still needs to maintain service levels and ensure stability of IT systems and associated infrastructure.

The Information Communication Systems Division (ICS) has 151 employees consisting of management, professionals as well as entry level employees. See the ICS employee profile on gender and race below:

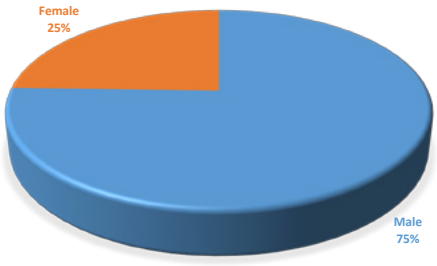


Figure 1: ICS Employees by Gender

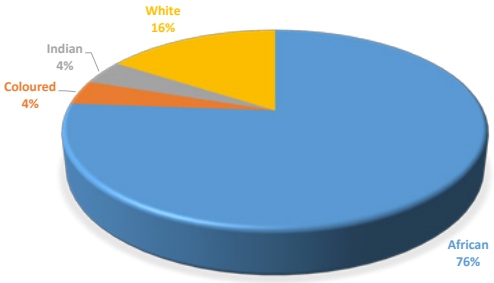


Figure 2: ICS Employees by Race

The ICS Division provisions support for all IT services through the Incident and Service Request Management processes. The Incident Management process is responsible for restoring IT services that have failed or where normal operations have been interrupted. The Service Request management process is responsible for accepting, approving, and delivering user requests for new equipment or standard IT services.

Below are the statistics for Incidents and Service Requests, as serviced by the ICS Division, for the years 2019 and 2020.

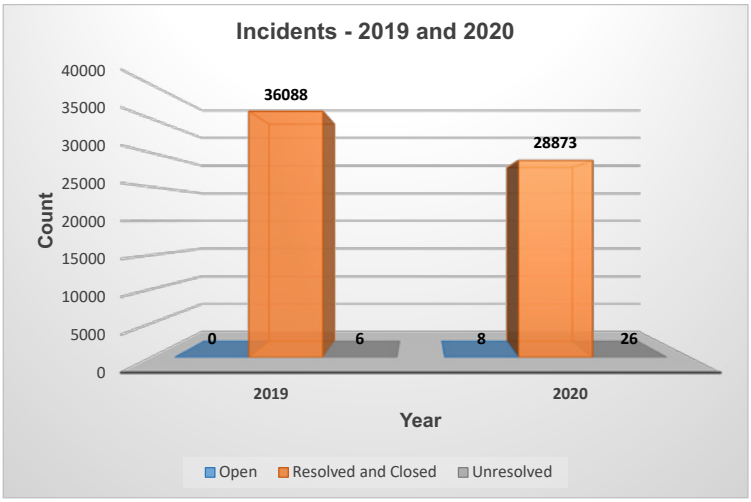


Figure 3: Incidents 2019 and 2020 Comparison

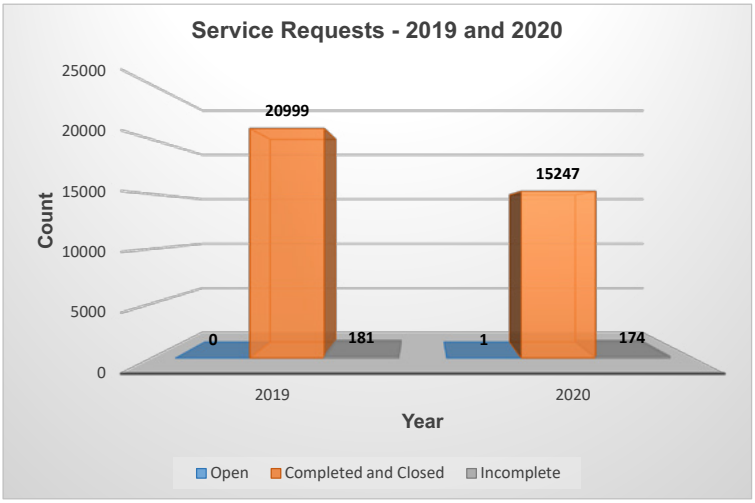


Figure 4: Service Requests 2019 and 2020 Comparison

The Information Communication Systems (ICS) Division is tasked with the planning, implementation and support of core Information and Communications Technology (ICT) systems and infrastructure services within UJ. The ICS Division currently comprises the following units:

- Infrastructure and Operations
- Networks and Telephony
- Technology Architecture and Planning
- Solutions Delivery
- Enterprise Systems
- ICT Governance and Strategy
- IT Service Delivery

Infrastructure and Operations

The Infrastructure and Operations unit ensures an up to date, stable, secure, and dynamic server infrastructure for the University, which includes Microsoft Windows and Linux servers consisting of both physical and virtual machines. The environment supports business critical applications such as:

- A hybrid email infrastructure hosted on premises as well as in the O365 cloud
- UJ web SharePoint infrastructure

Other critical functions provided by this unit include monitoring, securing, backing up and restoring of IT systems.

The unit manages the staff lifecycle process, in alignment with HR processes, and provides authentication for all student systems e.g., student email and ULink.

Network and Telephony

The ICT Network and Telephony Services unit designs, develops and maintains UJ's network, internet, telephony, VPN services, and network security infrastructure, which spans across four campuses and remote offices, providing seamless and secure connectivity to all stakeholders. This unit is also responsible for the provisioning and support of Wi-Fi connectivity to all libraries, lecture venues, student residences, student centres as well as the Wi-FI "Hotspots" areas located throughout the University. The unit manages the Telephone Management System and the BULK SMS service which is used as a key communication tool with students.

Technology Architecture and Planning

The Technology Architecture and Planning unit is responsible for the design and maintenance of UJ's ICT blueprint, together with the planning and implementation of the long-term architecture roadmap. This unit also consults with UJ's communities and key stakeholders to discuss and recommend fit for purpose ICT solutions including the piloting of new technology innovations. Other critical functions provided by this unit include the management of ICS facilities such as critical Data Centre infrastructure. This unit is also responsible for managing ICS facilities such as critical data centre infrastructure, Linux and Open-Source Software support within ICS and the High-Performance Computing Cluster (HPCC).

Solutions Delivery

The Solutions Delivery unit is involved in the development and integration of new ICT software applications that are custom built to UJ's needs, while also enhancing and maintaining current ICT applications that are already in production. This mandate is accomplished by first understanding business processes at Faculties and in support departments. Once these processes are understood and analysed, the next step is to identify gaps and/or opportunities for enhancements, to improve the experience of clients (who are generally students) in interacting with said areas.

Enterprise Systems

The Enterprise Systems unit is tasked with the deployment and maintenance and support of IT systems that support UJ's core mission of Teaching and Learning. The unit is responsible for ensuring that systems are operating effectively and actively coordinating across multiple business administrative departments, as well as for regularly engaging end users to improve experience.

These systems include:

- Enterprise Resource Planning (ERP) – The Oracle eBusiness Suite
- ITS Student Information System
- Perceptive Content
- UJ's Business Intelligence (BI) platform and the CELCAT timetable system

ICT Strategy and Governance

The ICT Strategy and Governance unit is responsible for the implementation of the ICT Strategy, Cybersecurity strategy and IT Governance framework for UJ by providing an oversight of all ICT projects and ensuring that the Project Management Office is managing and delivering all ICT Projects in an efficient and effective way, within budget, at the right time and of the right quality. The unit is also responsible for IT disaster recovery framework and testing activities as well as for scheduling simulations of system failures to test the effectiveness of disaster recovery processes. The services include management and coordination of both internal and external IT audits, management of IT risks as well as documentation and facilitation of ICS Division's policies and procedures, ensuring compliance with policies, rules, and regulations such as the Protection of Personal Information Act (POPIA) and the Electronic and Communications Act.

IT Service Delivery

The IT Service Delivery unit acts as an interface between ICS and the UJ community. The primary focus of the unit is to provide uninterrupted client services

and support. IT Service Delivery provisions the human and technology resources which enable and support UJ's teaching, learning and research as well as students and staff members, respectively. The core functions of the Service Delivery unit include provisioning and maintenance of Audio-Visual Services, Networking and Telephony client services, including Wi-Fi and computing services in all staff and Computer Lab environments. The function comprises multiple teams with various professional support focuses. The Service Delivery Teams include:

- The Centralised Help Desk
- Desktop and Network Support
- Audio Visual Services and Student Computing.

SUMMARY OF KEY ACHIEVEMENTS

The following key deliverables were achieved in 2020:

Cybersecurity Implementation Plan

The cybersecurity strategy implementation plan was approved in 2020. This program integrates with the cloud strategy and service strategy and has set goals in all areas of cybersecurity to improve the security posture of the university and manage IT risks.

Cybersecurity strategic plan incorporates a variety of processes and tools designed to help UJ deter, detect, and block threats. An incremental approach is taken to gradually mature cybersecurity practices, thereby improving agility and cohesion of all areas of IT operations.

IT Audit Management

Internal audits completed for the 2020 annual period are as below:

- IT SLA review.
- User Access Management – Application Systems and Databases.
- Penetration Testing.
- Database security review.

The reviews are completed, and resolution of findings is under way. Trends and observations made through the reviews are incorporated into the plans on a regular basis to ensure compliance and improve risk management.

IT Risk Management

At the top of the priority list of risks in 2020 is the risk of Cyber-attacks on UJ infrastructure and systems.

Frequent scans are being conducted to identify and remediate vulnerabilities in our systems with a defined and integrated vulnerability management processes. The perimeters of the network have been upgraded and are monitored to protect the University against unsolicited users.

The user access management standard and procedures empower both ICS and business system users to put in place sufficient controls to mitigate risks. This has assisted in remediating audit findings.

The outbreak of the Corona Virus was also rated as a priority risk as it could impact operations, staff health and wellness, and delivery on key projects. The University deployed alternative means to ensure data was provisioned for staff and students to ensure business continuity. Through participation in the COVID Coordination Committee, ICS also developed and constantly reviewed plans to ensure continuity on some projects while protecting employees from risk of exposure.

In collaboration with the UJ Protection Services Department, ICS put plans in place to prevent losses of IT equipment at the Soweto campus and have surveillance and access control improved for the Micro Computer Laboratories at this campus

Cybersecurity User Awareness

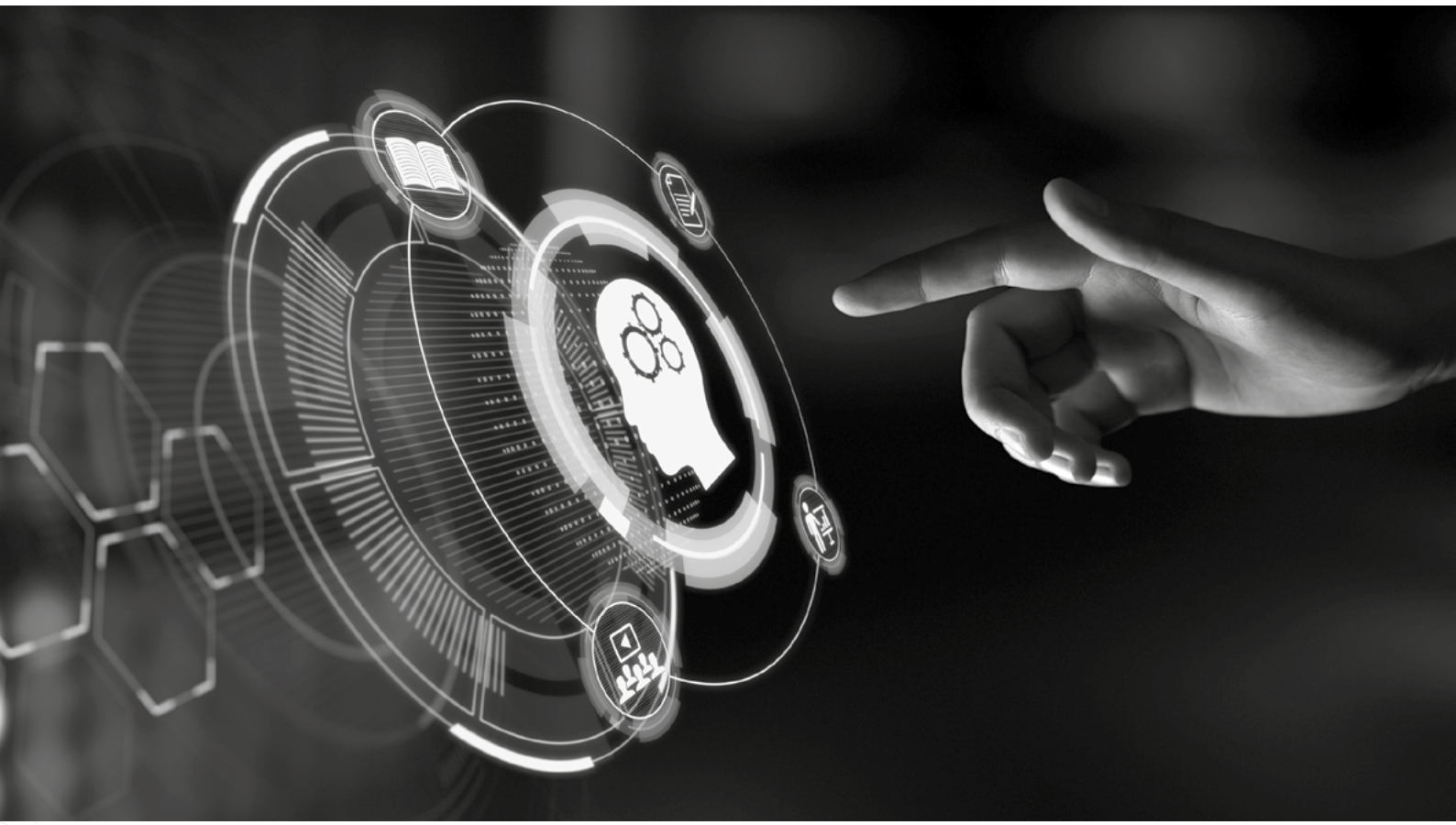
A Cybersecurity user awareness program was defined and approved in 2020. Although some elements of this program could not be implemented in accordance with the plan, due to COVID19, ICS conducted a user awareness program to different departments in UJ including the Library, FEBE as well as CAT since these departments also support IT applications and infrastructure for the University. The awareness program sensitizes UJ system users of prevalent cyber-attacks and creates a cyber-apt community of users.

ICT Governance Implementation

The Governance structures formed in 2019, in line with the UJ IT Governance Framework, are instrumental in shaping management and control of IT assets. Additional structures were implemented in 2020, namely the IT Security Steering Committee, the Enterprise Architecture Committee and the IT Audit and Risk Committee.

- The Enterprise Architecture Committee provides a platform to integrate and evaluate new IT initiatives.
- The IT Audit and Risk Committee is where audit and risk assessment are deliberated, and mitigation actions are made.
- The Information Security Steering Committee deliberates all levels of vulnerability assessment in an integrated manner and reports on remediation.

In support of the ICT Governance framework, an ICT Policy framework



was also developed. The ICT Policy framework is based on the goals for control of IT assets and services in UJ. It sets out a set of procedures or goals, which are used in negotiation or decision-making to guide a more detailed set of policies and maintenance of all IT related policies in UJ.

Progress in terms of IT Strategy implementation was reported on a quarterly basis at the Project Review Committee of Council. The change in the business environment brought about by COVID called for redirection of funding and review of priorities, resulting in some of the planned IT initiatives being postponed.

IT Threat Management

To improve threat detection, incident management and management of IT vulnerabilities in UJ, ICS has deployed a variety of tools to reduce the information security incidents and vulnerabilities:

- Vulnerability Management (Qualys).
- Symantec Endpoint Encryption.
- Cofense Security Awareness tool.

ICS also entrusted an independent Service Provider specialising in Information Security threat management with performing an external security assessment and penetration test to gain visibility of the state of vulnerabilities affecting our external, internet-facing systems and applications.

Network and Wi-Fi Infrastructure Upgrade

ICS initiated projects to upgrade the network and Wi-Fi infrastructure across all campuses by

installing new network equipment known as switches, controllers, and Wi-Fi access points. The aim of the upgrade is to increase Wi-Fi coverage and improve performance. This includes both indoor and outdoor areas. The Soweto campus network and Wi-Fi infrastructure phase 1 project were completed successfully. The APK library network equipment and Wi-Fi were also improved. The upgrades for the remaining campuses are continuing.

The UJ Island Wi-Fi service was established with Wi-Fi coverage in key areas such as the dining hall, rooms, and the conference facilities. The Kopano Residence near the DFC Campus was renovated. The ICS department deployed new network and Wi-Fi equipment. On behalf of the Protection Services Department, ICS coordinated the project for the installation of a new fibre network on the APK and APB campuses. This project will be concluded in 2021 as installation delays were encountered.

SMS System Upgrade

ICS undertook a project to upgrade the SMS system that is used to send messages in bulk to the student community. This system was successfully upgraded to a cloud hosted solution. Users of this system can login via the internet with no requirement that they be on a particular campus. This is a very effective communication mechanism that UJ uses to send messages. On average 120 000 messages were sent per month for 2020.

Network Security Upgrade

To further strengthen the security of the university's IT infrastructure, ICS installed an additional firewall for the APK Data Centre. This device prevents any unauthorized access to the University's information.

Furthermore, with the use of firewall devices, ICS further segmented and separated network communication by implementing firewalls for computer labs, Protection Services traffic, voice traffic firewalls and an inter campus firewall.

ICS also initiated more security related projects namely, perimeter firewall upgrade and firewall assurance projects. These projects will be concluded in 2021.

Telephone System Upgrade

The UJ telephone system was fully centralized with licenses being hosted in the cloud, eliminating the need for physical servers on the premises.

Security of the telephone system was enhanced by installing a Session Border Controller (SBC) device. The SBC is a special-purpose device that protects and regulates network communication flows. As the name implies, session border controllers are deployed at network borders to control communication sessions.

A new telephone service provider project was initiated and was awarded to a service provider.

Remote Working Initiatives

With the advent of COVID-19 and the need for remote and online working due to lockdown restrictions, the ICS department deployed soft phones to critical personnel, for example help desk agents, procurement personnel and finance personnel. The soft phone is a software program for making telephone calls over the internet using computers and laptops.

Furthermore, Microsoft TEAMS was used for conducting online meetings.

The ICS department enabled staff to work remotely by deploying a Virtual Private Network (VPN) client to staff computers. This VPN client allowed secure access to UJ's resources, for example servers and production systems, over the internet. Student VPN access was also tested successfully.

Technology Architecture – Virtual Architecture Team

The formation of a virtual Architecture team in 2020 consisting of ten resources across the ICS domain will assist with the documentation and knowledge transfer of the ICS Architecture Landscape. The team will assist in the following areas: Business Architecture, Information Systems Architecture and Technology Architecture. This will reduce some of the identified system, process and information risks identified within ICS.

Student Management System

During the annual registration period the ITS system used to manage student applications and registration is put under severe strain due to the number of students making use of the system for registration purposes as well as back end processes to support the registration effort. ICS does an annual stress test of the registration and late application process to identify any issues on the system that can slow down or stop the registration process. The risk to the University if the system fails is quite high, and ICS uses the stress test to identify bottlenecks and potential issues that can be addressed or noted, to ensure that the risk is minimised.

One of the areas identified as a potential risk was that of late applications which was moved from the on-premises environment to a hosted solution at AdaptIT to reduce the load on the ITS infrastructure. As the solution runs on the AdaptIT hardware, this process will not interfere with the registration process. The stress testing was done during November 2020. During the stress testing, a comparison was done between the 2019 and 2020, 100 user stress test and the results overall were significantly better.

Security Assertion Mark-up Language (SAML) Identity Provider (IDP)

A SAML Identity provider was deployed in 2019 with the on boarding of the Figshare platform for the

UJ Library. The IDP allows for staff and students to use their UJ account to authenticate against external systems. The authentication mechanism uses UJ infrastructure, so no user data needs to be provisioned on the external systems. Two additional external library systems were onboarded, namely TIPASA and Open Athens.

User account automation on Active Directory (AD)

ICS have been using Microsoft Identity Management (MIM) to synchronise biographical user data such as name, surname, office contact details and designation, from the HR Oracle system to the Outlook Address Book (residing in Active Directory). MIM also disables the accounts if an employee resigns and leaves the employment of the university.

In 2020 we embarked on the MIM Enhancements Project. The MIM system now caters for full automation of staff AD accounts, namely creation of new accounts, adding and creation of email address and the automatic management of these accounts throughout the staff members' lifecycle at UJ. During 2020, after much interaction and planning with HR and other stakeholders, the system was completely reconfigured, and the project will be finalised in January 2021.

Reducing Server Hardware Footprint in the Data Centres

Servers and Storage

The strategy for 2020 was to further reduce the server hardware footprint in the datacenters. It was more challenging to visit the various datacenters during the Covid-19 lockdown period, which delayed this process significantly.

Table 1: Hardware footprint for 2020

DESCRIPTION	PRE-2020	DEC-2020	DIFFERENCE
Servers (Physical)	219	201	-18
Tape Libraries	11	10	-1
Storage Arrays	14	11	-3

Number of tape libraries reduced from 14 to 11, which will be further reduced in 2021 as we continue to backup more server data to the Azure cloud. The reduction in hardware resulted in a saving in energy consumption in the datacenter in terms of both the power of the devices and the cooling.

Microsoft Azure Cloud Services

In 2020, ICS completed the project to architecturally design and secure the Microsoft Azure platform for production workloads. Various workshops were conducted to obtain required information from key domains within ICS dealing with governance, subscription management, naming conventions,

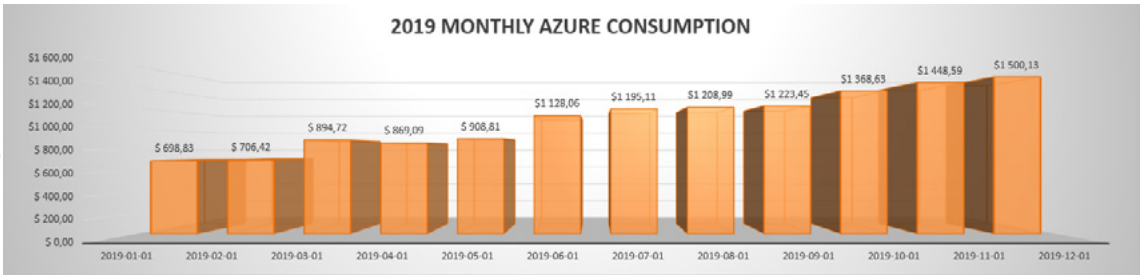


Figure 5: 2019 Cost for Azure

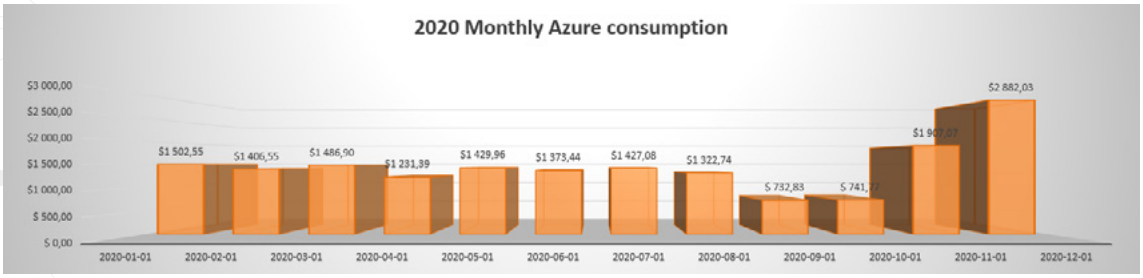


Figure 6: 2020 Cost for Azure

resource management, security, networks, and connectivity. This information was used to compile a functional specification for the UJ Azure cloud environment.

The identified services included multiple uplinks for redundancy into Azure from the various sites: Azure firewall and identity management, Azure Monitor, Azure defender, web applications with Azure Front door as well as backups to Azure where ICS will aim to phase out the need for backup tapes and hardware/services that this requires.
We have also migrated the ICS chat bot and log analytics workspaces used for our SQL database and Active Directory assessments from the old Azure environment to the new environment.

It was once again confirmed that moving traditional servers to Azure will not be cost effective and that applications and services will need to be adapted to function in a cloud environment as a Software as a service (SaaS) or Platform as a service (PaaS).

An increase in cloud expenditure is also noticeable when comparing costs from the previous (2019) report with the current costs.

O365 Advanced Threat Protection (ATP)

In the fight against cybersecurity attacks ICS implemented a new application, Office 365 Advanced Threat Protection. It is a Cloud-based email filtering service that can help protect UJ from malware and viruses. UJ staff rely heavily on emails to do business and to communicate with colleagues, collaborators, and customers. However, email is also the most prolific attack vector that threat actors are actively using to target and compromise our users and to breach our security environment.

After implementation there was immediate reporting on spoofed domains, spam and phishing attacks and top targeted users. Monitoring and implementation of mature processes continues and assists in increasing the cybersecurity posture of the university.

Central Academic Administration

Management of Marks System (MAMS)

In 2020, changes were made on MAMS in relation to optimising user experience and the system by handling duplicates. The Covid19 pandemic and the national shutdown necessitated that student assessment, which applied differently by faculty, module, and exam type, would need to be reformed. Modules which were normally assessed on a semester basis, were converted to either year modules or continuous assessment modules. The best mark criteria and calculations based on Exam Mark and Semester mark were successfully implemented. Exam entrance percentages also had to be changed so as not to penalize students who had to suddenly convert from contact learning to self-managed online learning.

Submission of Assessment Papers Secured System (SAPSS)

Earlier in the year, the system was enhanced to allow the selection of different size and colours of answer books and reformatting of special instructions. To maintain the quality standards of exams, it became necessary to enhance the system for randomization of question papers i.e., the system automatically and randomly selects a question paper between the 2 assessment types (main and supplementary). The system was also developed to determine similarity of questions papers going back current plus 2 years, to ensure that question papers are not repeated. However due to the same lockdown conditions, no sit-down exams were written. This meant that the SAPSS system had to be changed to allow for question papers to be issued without answer books.

Declaration of confidentiality

In 2018, ICS developed a system for all staff to declare online if they have a conflict of interest regarding student marks. In 2019, notifications and functionality for line managers to mitigate logged submissions were implemented, and ICS also enhanced the information in relation to the conflict itself. In 2020 the application was enhanced with a new functionality, to accommodate requirements by stakeholders.

F7 Appeal and Sick Exam Application

The F7 appeal and sick exam application forms were developed as an in-house application which is linked to the student portal uLink. The development work was completed in 2020, and the application will be rolled out with the 2021 supplementary exams.

Invigilator Request Form

ICS has developed an automated invigilator request form used to book/cancel invigilators, assign them to an exam room and complete a billing timesheet. Due to the lockdown and the fact that sit-down exams have been indefinitely suspended, the project has been temporarily de-prioritized.

Research & Innovation

University Research Committee (URC)

In late 2020 new requirements were built where the Research Officer can download an application in PDF and the system is linked to the Oracle systems where the user's information is automatically pulled.

University Capacity Development Grant (UCDG)

The grant is a consolidation and extension of the functions that were served by the Teaching Development Grant (TDG) and the Research Development Grant (RDG). The purpose of this grant is to enhance the research and teaching ability of universities and to improve research productivity through a focus on developing the research capabilities of academic staff in need of development in this area. An automated funding programme is currency being developed to replace the current manual form.

Office of the Chief Operating Officer

Protection Services – Event Management System

ICS developed a system for the process of managing risk when the University hosts big events. For these events there is a fair amount of coordination required internally. UJ partners with the SAPS, Ambulance Services and City of Johannesburg for these events.

Human Resources – Temporary Employee Application (TempEmp)

The Temporary Employee portal which is used to capture the employee's details was enhanced so that fields on the webapp validate with the fields on Oracle, i.e., capture the same data type and format set on the oracle application.

Teaching and Learning

Community Based Engagement (CBE)

The College of Business and Economics (CBE) runs Community Engagement Projects (100 projects reported annually) through the Community Engagement Committee. ICS has automated the form to aid quality data capturing of the community engagement projects, and the storage descriptors of each project; some of which run only annually and some for several years.

Faculty Higher Degrees Committee (FHDC)

For the Humanities Faculty, ICS automated the manual form which will aid in streamlining and simplifying the current process of forwarding requests and proposals by candidates who may be admitted to a master's or doctoral programme.

Student Affairs

ICS developed a system to enable students to apply online for registration funding from the SRC Trust fund and for meal assistance. The application was enhanced to allow the attaching of a consent form (for those under 18 years using a passport), affidavits, consent letters, part-time curricular courses and for administrators to view approved documentation.

ITS Integrator system database upgrade

ITS Integrator system database was upgraded from version 12c to the latest version database 19c. The upgrade will ensure the system is stable and remains fully supported by the database product owner. Oracle Corporation announced that Oracle database version 12.2.0.1 premier support will end on 30 November 2020; thereafter they will only offer limited support and attend to priority 1 issues.

ITS Personnel iEnabler User Access module

ICS completed the implementation of the Personnel iEnabler User Access module. ITS users make use of this module to apply for Integrator menu options. It comes standard and fully licensed with the subsequent ITS Integrator versions. The objective of the Personnel iEnabler is to provides seamless, end-to-end automation to control user access in the ITS Integrator system.

This eliminates the paperwork Involved in applying for access to Integrator menu options. Users can apply for access in one sitting without moving from one office to another. This also reduces the costs of printing access request forms.

Oracle Procurement Cloud System

ICS collaborated with the Financial Expenditure Division to facilitate the appointment of a third-party supplier to implement Oracle Fusion Cloud Sourcing, Contract Management and Supplier Qualification Management modules. The objective of the project is to streamline the sourcing and tendering process, and reduce the manual work effort of the overall sourcing and contracting process.

Oracle License Assurance

ICS engaged an Oracle licence assurance Service Provider to assess the usage of Oracle licenses, to ensure compliance with the current UJ Oracle license agreement. The services by an independent supplier provided the University of Johannesburg with a recommendation report on usage and gaps. This ensured that ICS proactively resolved the noncompliance of licenses to avoid penalties from Oracle.

Data Governance Assessment Project

ICS appointed a third-party supplier to conduct an assessment on current UJ data governance maturity, with the objective of identifying the gaps, defining roles and responsibilities for data governance structures and making recommendations on the implementation roadmap and plan to roll out data governance within UJ.

Business Intelligence (BI) System Projects

The BI System has been integrated with more than 20 source systems within the UJ environment as well as other external systems. This is to ensure that the UJ BI system provides better reporting and analytics. BI dashboards and reports were developed for various departments within the University to reduce the manual effort in reporting.

IT Asset Management System

ICS went through a process of documenting the policies and processes for IT Asset Management. The Asset Management system enables the effective management of all computer hardware and software through the adoption and implementation of an ICT asset management process and controls and the automation thereof, which is aligned to best practices.

This system will assist with the following:

- Better management of IT assets.
- Ensure software license compliance.
- Easier reporting of the current IT assets.
- The system will assist relevant stakeholders in making data-driven decisions on IT asset Management.

Modernised IT Service Strategy

ICS developed a modern IT Service Strategy with four key principles which will tailor best practices to ensure that the institution achieves its strategic objectives. The principles are:

- Enhanced Capability and Competency.
- Service Orientated Processes.
- Improved Quality of Service.
- Digital Enablement.

The Service Strategy will assist ICS in delivering better, cost effective and efficient ICT services to all UJ stakeholders. For the ICS Division to support the ICT 4.0 Strategy and their customers' service and support requirements, the target operating model will need to be enhanced in the long term. A target operating model identifies customer service and technology components required to effectively service the customer.

Customer journey experience inputs were acquired through a process of facilitated workshops conducted with "personas" (customer types) identified by ICS. These, along with results from the IT service management maturity assessment and customer satisfaction assessments, served as inputs into the development of the Target IT Service Delivery Operating Model.

Audio-Visual (AV) Monitoring and Management System – Smart and Connected Classrooms

ICS implemented the Crestron Fusion AV Monitoring and Management system to enable 80 venues on APK and SWC campuses to be remotely managed, monitored and controlled.

Project Benefits:

- Effective resolution of AV Incidents
- Live Monitoring and Reporting of AV Equipment
- Increased AV Equipment uptime.

Audio-Visual Hardware Refresh – 44 Teaching and Learning Venues

Owing to aging Audio-Visual infrastructure in the teaching and learning venues on all UJ campuses, ICS embarked on a project to refresh the aging hardware. The project was funded by the Department of Higher Education and Training (DHET). The project included the installation of the latest Audio-Visual Technology (Smart classroom) in teaching and learning venues on 3 campuses, namely SWC, APB and DFC, where aging Audio-Visual had been identified.

Student Computing Desktop Replacement – Micro Computer Laboratories (Labs)

ICS has replaced a total of 1 635 computers in the Student Computing Labs across all four campuses. This is a continuous improvement process for the Student Computing environment and will equip the laboratories with modern computers to meet students'

expectations. The replacement process of these computers ensured that all leased computers in the student laboratories were returned to the third party supplier, InnoVent.

Staff Computer Replacement

In the wake of the COVID-19 pandemic, the priority was to replace Desktops with different models of Laptops, with specifications that matched the desktop Standards to enable more users to operate remotely. 341 devices were issued to the users in 2020.

SUMMARY OF KEY CHALLENGES AND RISKS

Key challenges

Maintenance backlog

Most of the IT infrastructure (Audio-Visual, Network, WI-FI and End User Computing Devices) has aged or reached end of life. Inadequate funding over the years is a major challenge which has resulted in maintenance backlog and equipment failures.

Funding constraints

Due to high costs associated with the implementation of the private cloud infrastructure, funding to consistently maintain and provide required server infrastructure and storage remains a challenge. This also applies to the audio-visual infrastructure funding requirements for all the teaching and learning venues.

Scarce skills set

As new technologies become available, the regular need to upskill staff in hardware on various platforms increases. There is a challenge to meet rapidly increasing business demands on time due to limited budgets and limited skilled resources.

Human capital constraints

ICS has been able to meet the expected deliverables and key initiatives but is faced with the lack of the required resources to meet these deliverables. To meet the strategic objectives of the University and reduce the reliance of ICS on external consultants and service providers, the staff and costs constraints must be addressed.

Key risks

Threat of cyber attacks

Cybersecurity continues to be a major risk to the University and has become even more significant as UJ embarks on its Digital Transformation Journey. ICS has placed emphasis on the cybersecurity risk by embarking on an initiative to implement a cybersecurity strategy that focuses on policies, processes, technologies and resources.

WHAT THE FUTURE HOLDS

In 2019, the future was predicted to still include technologies such as cloud computing, artificial intelligence and robotics, and these technologies were geared to change and support IT in digitally transforming organisations. These are still valid, however, the COVID-19 pandemic and its widespread impact over the course of 2020 has made prediction of the future so difficult, that even experts are reluctant to say precisely how the future will take shape.

However, ICS will continue to support the University in its endeavours to be digitally transformed, to achieve UJ's Strategic vision of alignment to Industry Revolution 4.0

The future will continue to be disrupted by new generation technologies, and areas that are of interest to ICS and that cannot be avoided include:

- Quantum and edge computing
- Robotic Process Automation (RPA)
- Augmented reality applications

CONCLUSION

In conclusion, ICS will continue its drive to ensure that the skills gap is breached by continuing with LinkedIn and Pluralsight technical and professional training to improve technical skills for all ICS employees. These two training platforms provide ICS employees with access to thousands of courses authored by industry experts including mock-up tests, labs, hands on learning and recognised certification in various IT technical fields.

Design and layout: UJ Graphic Design Studio


2535
879
GMB
MODEL:428
7239
572

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