wattnow

THE OFFICIAL PUBLICATION OF THE SOUTH AFRICAN INSTITUTE OF ELECTRICAL ENGINEERS

SMART BUILDINGS

JULY 2024

SAIEE

CONTENTS

SAIEE @SAIEE SAIEE

Dear **watt**now reader,

As we enter the Fourth Industrial Revolution (4IR) era, the concept of smart buildings has gained significant traction. Integrating advanced technologies is reshaping the future of engineering and architecture, from energy efficiency to automation. These smart buildings are not just passive structures but dynamic hubs that respond intelligently to the needs of their occupants.

This issue, featuring Smart Buildings, looks at the ethical dilemma in smart buildings in "Efficiency and Convenience vs. Privacy and Safety" on page 36. The SAIEE Cybersecurity Chapter also creatively put together this article. They are eagerly looking for anyone interested in cybersecurity to join them. Email the Cybersecurity Chapter at csc@saiee.org.za.

Our second feature article, on page 40, looks at the blueprint for using IT to create smarter cities, mapping the journey from data discovery to implementing AI models for urban use cases.

In the August (women's month) issue featuring Lightning, I will showcase female SAIEE Members in "Celebrating Engineering Femininity". I urge all our female members to please send a high-resolution photo (no selfies, please) and a brief bio by 15 July 2024 - minx@saiee.org.za

Here's the July issue; enjoy the read!

MANAGING EDITOR
M Avrabos

TECHNICAL EDITOR
J Buisson-Street

EVENTS
G Geyer

TRAINING ACADEMY
Z Sibiya

MEMBERSHIP
C Maseko

ADVERTISING
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SAIEE HEAD OFFICE
18A Gill Street, Observatory, JHB
T 011 487 3003
www.saiee.org.za
Office hours: 8am - 4pm

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Pascal Motsoasele
2024/5 SAIEE President

It is always a pleasure to write to our members and supporters to update them on our activities. I am very much encouraged by the activities of our Centres across the country, both the online and in-person events. I am also pleased to see the attendance numbers for webinars hosted by our various sections and chapters, including those by our student chapters across the various tertiary institutions. We are growing! I will endeavour to attend as many events as possible, online and in-person.

E: president@saiee.org.za

Winter is in full swing. I have not had the opportunity to attend many in-person events this month; many were online. We had an online workshop titled "Governance for NPOs" on the 31st of May 2024 conducted by the IoDSA. The information shared with us during that workshop is invaluable as we sort out the legal requirements and logistics around the Institute's registration as a non-profit company (NPC) with the CIPC, a non-profit organisation (NPO) with the Department of Social Development, and a Public Benefit Organisation (PBO) with SARS. We plan to hold an advisory engagement with the IoDSA to chart the way forward. I will keep you posted as these solidify.

In the meantime, please be informed that the finances of this 115-year-old Institute are in good shape. Yes, we are a fraternal voluntary association of engineering practitioners, and yes, our operations are funded mostly through membership fees, but we have been exploring other avenues to diversify our income stream. To that, we do have a fully-fledged training academy that offers online and in-person CPD-accredited courses. The courses are being marketed through our website, emails to members, and adverts on all our social media platforms. Please be on the lookout for relevant courses in your industry and let your HR department contact us as we can offer group discounts. These in-person courses can also be conducted at your premises countrywide; feel free to request a quote.

Another income diversification effort relates to us engaging corporates to partner with us. We provide several benefits to such corporate partners, including advertising their wares on all our media platforms, providing professional mentorship to their employees, and connecting them to our students through our internship/employment programme. I urge our members to please increase our reach by being ambassadors of the SAIEE in their work environments. Please reach out to us for a complete list of corporate partnership benefits. What's in it for you, you may wonder. Well, the SAIEE launched a Charge Rewards Programme a few years back. The rewards points you collect can be exchanged for attendance at events that require payment, attendance at courses, and even payment of your membership fees!

I want to encourage our members to participate in the SAIEE's activities. Volunteer to serve on the committees of the various Centres, Sections, and Chapters and collect SAIEE Charge Rewards Points. Attend our events and webinars and collect ECSA CPD points. The networking is invaluable, trust me!

We are planning an in-person event – The President's Invitation Lecture. Our confirmed speaker is Ms Nomso Kana, founder of Simsciex Technologies. Ms Kana is a renowned nuclear scientist and a leader in energy, policy, and broadband infrastructure. Her inspiring story and expertise on broadband access, 4IR, and nuclear make her a compelling voice in the industry. Our members would greatly benefit from learning about her journey and insights. See the advert on the next page.

Until the next letter, please feel free to write to me so that this becomes a conversation, not a monologue. I read all emails personally, and respond.
Yours in service of the Institute. wn

2024 President's Invitational Lecture

The Impact of 4IR Technologies on Engineering Practice

The Fourth Industrial Revolution (4IR) has transformed engineering practice in South Africa with technologies like artificial intelligence, the Internet of Things, and big data analytics. Smart grids use advanced sensors and communication networks to optimise electricity distribution and reduce energy consumption. Digital twin modelling allows engineers to simulate different scenarios and optimise system performance. In a recent case study, a South African engineering firm successfully implemented 4IR technologies to enhance the efficiency of a water treatment plant.

Our Guest Speaker: Ms Nomso Kana

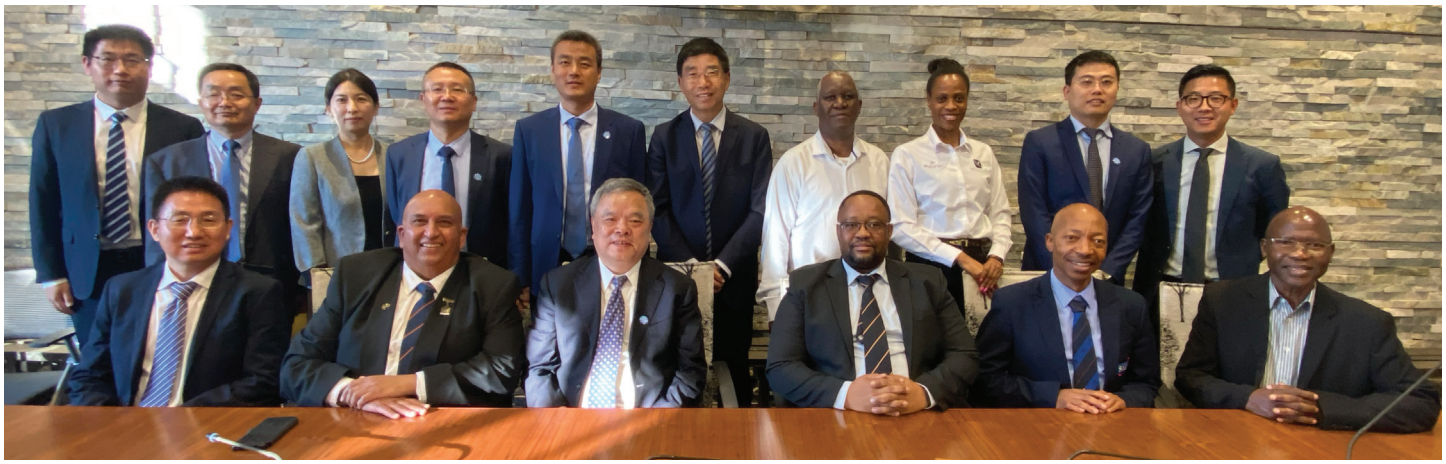
Ms Nomso Kana, a distinguished nuclear scientist by profession, was appointed in 2019 as one of the esteemed Commissioners for the Fourth Industrial Revolution (4IR) within the Presidency. Her extensive expertise extends beyond nuclear science, energy, policies, and connectivity into the dynamic arena of broadband infrastructure, where she leads her own company that focusses on advanced domain naming system training and cybersecurity.

DATE & TIME
18 July 2024
18h00 - 20h00

VENUE
SAIEE House
18A Gill St, Observatory JHB

RSVP
Gerda Geyer
geyerg@saiee.org.za
By 12 July 2024

GEIDCO visit SAIEE



Front row from left – Mr Chen Gesong (Director General of Development Bureau of GEIDCO), Prof Pat Naidoo (SAIEE Honorary Treasurer), Mr Liu Zehong (Executive Vice Chairman of GEIDCO), Mr Pascal Motsoasele (SAIEE President), Mr Leanetse Matutoane (SAIEE CEO), Mr Andries Mthethwa (ACTOM Chairman).

Back row from left – Mr Jiang Fan (Senior Staff of GEIDCO Africa Office), Mr Sun Lianming (Director of GEIDCO Africa Office), Ms Wang Lang (Deputy Director of International Cooperation of GEIDCO), Mr Guan Xiupeng (Deputy Director General of General Office of GEIDCO), Mr Zhao Yun (Vice Director of News & Media Center of GEIDCO), Mr Wang WenAn (Chief Representative of State Grid African Representative Office), Dumisani Ngwenya (Sentech), Josephine Pretorius (TransAfrica Projects), Mr Ni Yu (Assistant of Executive Vice Chairman of GEIDCO), Mr Zhou Lizhi (Senior Staff of State Grid African Representative Office).

The SAIEE President, Pascal Motsoasele, and several Corporate Forum members recently hosted a delegation from GEIDCO at the SAIEE Head Office in Johannesburg.

GEIDCO, the Global Energy Interconnection Development and Cooperation Organization, was established in March 2016 and has its headquarters in Beijing, China. This non-profit international organisation is dedicated to advancing sustainable energy development globally.

The Global Energy Interconnection (GEI) is a forward-looking, electric-focused energy system designed to promote the worldwide integration, construction, and mutual benefit of clean energy resources. GEI integrates "Smart Grid + UHV Grid + Clean Energy" and is a vital platform for large-scale global development, transmission, and utilisation of clean energy resources.

During GEIDCO's visit to the SAIEE head office, both organisations had the chance to explore potential areas of collaboration in the energy sector.

"We discussed various projects and initiatives that could benefit from our joint efforts, including renewable energy integration, grid modernisation, and capacity-building programs. We are excited about the possibilities for our organisations and the positive impact we can make in the energy sector", said Pascal Motsoasele, SAIEE President.

The SAIEE works closely with IEEE, CIGRE and SAPP, the Southern African Power Pool that hosts the regional grid supporting both bilateral and competitive market trading of electrical energy. Comprehensive national transmission development and regional generation and transmission expansion plans exist and require our collective support towards project development and commissioning, and we are looking forward to be working with GEIDCO", concluded Leanetse Matutoane, SAIEE CEO. wn

ACTOM Kenya secures key contracts and eyes several growth areas in the East African region

Kelvin Ageng'o Oriwo
General Manager, ACTOM Kenya

Since opening its Low-Voltage (LV) manufacturing facility in Kenya in July last year, electrical equipment and services supplier ACTOM has identified several growth opportunities in the region.

Kelvin Ageng'o Oriwo, General Manager of ACTOM Kenya, says while the factory has been heavily focused on the LV space, it recently built its first Medium-Voltage (MV) protection panel.

"Since we are the only manufacturer in East Africa who builds MV protection panels, we expect this to be a key area of growth for us across the East Africa region, specifically in the Kenyan, Ugandan and Tanzanian markets," says Oriwo.

He adds that ACTOM Kenya has recently secured various "mission-critical" contracts, such as for the supply of LV Panel BlokSets to Uganda, Kenya, and Rwanda.

"The orders from Kenya and Rwanda are critical as the pharmaceuticals sector is a quality- and specification-sensitive space. This therefore speaks to our strength in terms of product quality and guarantees, alongside our capacity to service clients specifically concerned with assurance and quality," stated Kelvin.

"The Uganda contract is a sensitive project with a major brand client, reflecting the growing trust brands are placing in ACTOM Kenya in the region. Given that the client is in Uganda, the contract aligns with our efforts to ramp up our regional output."

GLOBAL TRENDS

Oriwo says ACTOM's decision to establish a manufacturing hub in Kenya was largely influenced by global trends of multinational companies increasingly coming into East Africa, with their entry point most often being Kenya.

"Additionally, the technical capacity in Kenya is generally much higher than in many countries in the Sub-Saharan region. So, it makes it easy for an Original Equipment Manufacturer (OEM) like ACTOM to find its footing in this country," he explains.

"Along with those factors, ACTOM has also performed very well in South Africa over the years. However, if you compare South Africa's Gross Domestic Product (GDP) with the combined GDPs of Kenya, Tanzania and Ethiopia, it is a bigger market than South Africa."

To achieve its goal of becoming the powerhouse that powers Africa, it makes sense for the group to drive geographical diversification into East Africa.

Oriwo points out that the electricity uptake per capita in the East African region is also generally lower than in South Africa, meaning that the region has a lot of growth potential in the energy space. It therefore makes sense for an OEM to plug into this opportunity.

FULLY LOCALISED

ACTOM Kenya's manufacturing facility is now 100% localised and employs 66 people directly and a further six indirectly. Oriwo says that this fosters a sense of pride and confidence within the local business community as they operate and manage a large factory.

He added that the company will participate in the Power and Energy Africa Expo 2024, which will be held in Nairobi from 26 to 28 June 2024. wn

AI agriculture pest detection tool from Kenya wins tenth Africa Prize for Engineering Innovation in Nairobi

Esther Kimani, Africa Engineering Prize winner

Esther Kimani was named winner of Africa's biggest engineering prize, the Royal Academy of Engineering's Africa Prize for Engineering Innovation, in Nairobi on 13 June 2024. Her early crop pest and disease detection device was selected as the winning innovation for its ability to swiftly detect and identify agricultural pests and diseases, reducing crop losses for smallholder farmers by up to 30% while increasing yields by as much as 40%.

On average, five million smallholder farmers in Kenya lose 33% of their crops to pests and diseases. Kimani's innovation provides real-time alerts within five seconds of an infestation, offering tailored intervention suggestions and alerts government agricultural officers to the presence of diseases or pests, contributing to broader agricultural management efforts.

The solar-powered tool uses computer vision algorithms and advanced machine learning to detect and identify crop pests, pathogens or diseases and the nature of the infection or infestation. The device then notifies the farmer via SMS. This alternative to traditional detection methods leases for just $3 per month, which is significantly cheaper than hiring drones or agricultural inspectors.

The Royal Academy of Engineering founded the annual Africa Prize in 2014 to support innovators developing sustainable and scalable engineering solutions to local challenges in Africa.

This year, the Africa Prize alumni community has grown to almost 150 entrepreneurs from 23 countries, who together have generated more than 28,000 jobs and benefitted more than 10 million people through their innovative products and services.

To celebrate the 10th anniversary of the Prize, the Royal Academy of Engineering hosted the Africa Prize Alumni Reunion, bringing together 100 innovators from the past decade for a three-day programme ahead of the final ceremony. This momentous occasion showcased the strength of the community united by the Prize.

Esther said: "My parents would lose up to 40% of their crops each farming season, which affected our standard of living. We are empowering smallholder farmers, many women, to increase their income. We aim to scale to one million farmers in five years."

Malcolm Brinded said: "These awards form part of the Royal Academy of Engineering's investment of over £1 million to African innovators through grants, prizes and accelerator programmes during the tenth anniversary year of the Africa Prize."

Esther received KSh 8.3 million to develop the device further. This is the largest amount awarded to a winner, in honour of the 10th Anniversary of the Prize.

The 2025 Africa Prize for Engineering Innovation, launched at the 2024 final, is now open for entries. The Academy is looking for scalable engineering solutions designed to solve local challenges, and individuals and small teams living and working in sub-Saharan Africa are invited to enter. The deadline for entries is 15 October.

Visit the 'How to Apply' guide on the Africa Prize website. wn

First battery-electric trolley truck system for underground mining becomes a reality

Boliden, Epiroc, and ABB have passed a new technology milestone by successfully deploying the first fully battery-electric trolley truck system on an 800-meter-long underground mine test track in Sweden, with a 13 percent incline. This means the mining industry is a step closer to realising the all-electric mine of the future, with sustainable, productive operations and improved working conditions.

The achievement of the collaboration in Boliden's Kristineberg mine in northern Sweden marks a critical moment for the mining industry as it continues to face rising pressures to balance increased outputs of critical minerals and metals with lower carbon emissions and energy usage. Demand for minerals critical to society's clean-energy transformation is predicted to increase 1.5 to seven times by 2030, according to the IEA, making electrification a priority.

In tandem with reducing carbon emissions, the electrification of mining also promises improved health and safety for the industry's workforce. By deploying this system, the collaboration partners aim to prove that the underground working environment can be significantly improved, with less emissions, noise and vibration while reducing the total cost per ton.

"Over the past three years, we have collaborated closely with the ABB and Epiroc teams to bring the electric mine of the future one step closer," said Peter Bergman, General Manager of Boliden Area, Boliden.

"The most important thing for us is that the technology works in our own operations, but we also see the added value that we, together with our partners, can drive technology development so that the system can be used in other mines. We are proud to have taken this concept to a live instalment."

Each partner has provided a unique expertise to this development process, demonstrating the value of industry collaboration. Epiroc has added dynamic charging to its proven battery-electric Minetruck MT42 SG and battery system, and the trolley solution is equipped with ABB's DC converter, HES880 inverters and AMXE motors to enhance the power.

The truck features a trolley pantograph connected to an overhead catenary line, a concept highly suitable for long-haul ramps. The electric trolley line assists the battery-electric mine truck on the most demanding stretches up-ramp while fully loaded, enabling further reach and battery regeneration during drift, drastically increasing productivity for a mining operation.

ABB created the infrastructure from the grid to the wheel, including the electric trolley truck system design and the rectifier substation for the test track.

The project partners jointly developed the definition of standards and vehicle interface. The eMine™ Trolley System also integrates with the distributed control system (DCS) ABB Ability™ System 800xA® to monitor the electrical system.

Click here to read more. wn

SolarAfrica breaks ground on SunCentral solar farm, the next big step towards 1 GW

From left: Paul van Zijl (Group CEO, Starsight Energy); Melvin Jones (CEO, Proconics); Motlatsi Makhari (Senior Advisor IPPs, Eskom); David McDonald (CEO, SolarAfrica Energy); Lulamile Nkumbi (Mayor, Emthanjeni Local Municipality); Moreetsi Balepile (Senior Advisor IPPs, Eskom)

Independent Power Producer SolarAfrica Energy has officially broken ground on its first utility-scale solar farm in the Northern Cape. Known as SunCentral, Phase 1 of this project will total around 342 MW in generation capacity, with Phases 2 and 3 bringing the total size to an impressive 1 GW—making it one of the largest projects of its kind in the country.

A PROJECT OF PARTNERSHIPS

During the breaking ground ceremony, David McDonald, CEO of SolarAfrica Energy, explained the significance and strength of the partnerships behind SunCentral—a key driver of its success.

"A project of this magnitude wouldn't have been possible without the power of partnerships. Over the past decade, Eskom has found new and tangible ways of making wheeling a reality in South Africa. Their dedication to partnering with the private sector proves their commitment to address South Africa's power generation struggles," McDonald said.

Emthanjeni Municipality and Business Chamber representatives also attended the event, where McDonald acknowledged the importance of fostering positive relationships within the community. Mayor Lulamile Nkumbi expressed the municipality's support for the project and emphasised the importance of maintaining open and transparent communication between all stakeholders.

A special mention went to Soventix, South Africa. The company initially developed the project for submission into the Renewable Energy Independent Power Producer Procurement Programme (REIPPP). Soventix sold the rights to Phase 1 of the cluster development to SolarAfrica and will continue to develop Phases 2 and 3 for the project as time progresses.

Engineering, Procurement, and Construction (EPC) firms Proconics and Sinohydro are instrumental to the project's success. Proconics will install SunCentral's Main Transmission Substation (MTS), while Sinohydro will install more than 500,000 solar panels.

INFRASTRUCTURE INVESTMENTS AND INDUSTRY ADVANCEMENTS

Phase 1 of the project comes in at just under R5 billion. The MTS, totalling around R1 billion, is funded by SolarAfrica and will play a pivotal role in ensuring the power produced on-site can be evacuated into the national transmission grid. The solar installation adds another R4 billion to the investment, emphasising the significant contribution SunCentral will make to the country's power infrastructure. "Investments of this nature go a long way in bolstering the grid's ability to manage and distribute power across the country," McDonald said.

As part of the greater Starsight Energy Group, SolarAfrica's SunCentral project will also serve as a blueprint for the adoption of wheeling projects in East and West Africa, with a specific focus on Kenya and Nigeria.

POWER FOR GOOD ON A LOCAL AND NATIONAL LEVEL

A project of this extent no doubt impacts both local and national levels.

Located between Hanover and De Aar, SunCentral has several corporate

KELLER's Perfect sensor solutions

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INSTROTECH KELLER Custom Solutions

INSTROTECH, local representative of KELLER, a Swiss-based market leader in the production of isolated pressure transducers and transmitters, wherever pressure sensors are needed, a solution can normally be found in the KELLER standard product catalogue.

However, there are often great benefits to optimising a product specifically for integration and use in existing complete systems. In addition to outwardly identifiable components such as housing parts or plugs, this also includes the inner workings of the sensor. Keller by Instrotech offers many individual parts in-house and establishes close working relationships with their suppliers, enabling them to make a wide variety of modifications with ease.

Contact INSTROTECH for more information on KELLER's Custom Solutions - sales@instrotech.co.za or www.instrotech.co.za wn

social responsibility projects that will be implemented in collaboration with local members and leaders for the betterment of the surrounding communities.

"The CSR projects will be aligned to the community needs assessment that will be continuously updated as well as the United Nations Sustainable Development Goals, National Development Plan, Emthanjeni Local Municipal Strategic Objectives, and SolarAfrica's company values," McDonald said. On a national scale, SunCentral will contribute towards lightening the generation burden off Eskom so that the private and public partnerships can continue to address South Africa's power struggles.

PRODUCING GREENER, CHEAPER POWER FOR MORE BUSINESSES THROUGH WHEELING

SunCentral will provide power on a one-to-many basis, meaning more South African businesses can access cheaper, cleaner energy via wheeling. It's no longer reserved for mega power users, which will significantly drive economic growth in the commercial and industrial sectors.

The power generated at SunCentral is 100% green and up to 50% cheaper than utility power. This enables South African businesses to combat the constant electricity tariff hikes while supporting their sustainability goals. Businesses interested in accessing this power can sign a Virtual Power Purchase Agreement with SolarAfrica.

CUSTOMERS ARE ALREADY SIGNED UP FOR PHASE 1, MORE TO COME

Organisations like Vantage Data Centers, ATTACQ, and Enpower Trading have already signed up for Phase 1 of the project, and it's clear that businesses are keen to benefit from the cost-saving and environmental benefits of wheeling. With Phases 2 and 3 in the pipeline, companies will have even more opportunities to sign up.

SolarAfrica is in the process of finalising several other solar projects in other parts of the country as they build towards a generation portfolio totalling more than 3 GW.

McDonald added that breaking ground on this project was not an achievement limited to SolarAfrica alone but rather an accomplishment for all involved as it underscores the immense potential of wheeling in South Africa.

"SunCentral is now poised to harness this potential to its fullest extent, contributing to a sustainable energy supply for our customers and the broader communities," he concluded. wn

SAIEE Student Membership Fees waived until 31 August 2024!

The South African Institute of Electrical Engineers (SAIEE) is always looking at novel ways to grow the institute and to ensure sustainability.

OUR GROWTH COMES IN TWO FORMS:

1. From new members who are already in the field, and

2. From organic conversion from student members to members/associates.

Any organisation worth its salt knows that the most significant contribution to an institute comes from converting its student members into members. Being an SAIEE student member costs R205, payable annually.

IS THIS COST REASONABLE OR NOT?

As students at Higher Education Institutions (HEI), which constitute South Africa as either a University, University of Technology or TVET College, we know that tuition fees are expensive. This was evidenced by the 2018 student strike at Wits University, which resulted in the government resolving to offer free education through the National Student Financial Aid Scheme (NSFAS) scheme.

Typically, any social club or grouping must register at the HEI to be recognised, and after that comes the hard slog of recruiting other like-minded individuals to join the cause. In our instance, Electrical Engineering students should get involved with the HEI student chapter.

To date, there has been a vexing question about what a reasonable amount to charge for student membership is.

The SAIEE has decided on the following:

1. The SAIEE Student Membership fees remain current and will remain the same for the next five years.
2. The SAIEE Student Membership fees will be waived until 31 August 2024.
3. The waiver in point 2 above is communicated to student members as a discount for the recommended period.

For more information on SAIEE Student Membership, feel free to contact our dependable Membership Team via the following details:

Connie Makhalemele
T: 011-487-9045 or email
connie@saiee.org.za

Thandolwethu Lefutso
T: 011-487-9050 or email
thando@saiee.org.za

Alternatively, navigate to the SAIEE website Membership pages for more information: bit.ly/JoinSAIEE

JOIN SAIEE

- the gateway for a successful career

Make a difference today - join us!

The South African Institute of Electrical Engineers (SAIEE), founded in 1909, strives to provide leadership to all its engineering practitioner members in becoming more effective in providing and enhancing the quality of life of all communities in Southern Africa.

AS A STUDENT, YOU ARE THE FUTURE.

Any engineering student signing up between 1 March and 31 August 2024 will receive free membership for the year. Apply now!

Click here on how to become a member today!

SAIEE

For more info, email Dudu Madondo - reception@saiee.org.za

Integrity NDT Projects Hosts VUT Students for an In-Depth Exploration of Non-Destructive Testing

Further solidifying the collaborative spirit established through the December 2023 Memorandum of Understanding (MOU) between Two Roads Group and the Vaal University of Technology (VUT), Integrity NDT Projects, a member company of Two Roads Group, successfully hosted a delegation of VUT students on Tuesday, May 28, 2024.

This initiative aligns seamlessly with the MOU's core objective of cultivating future professionals in the critical Non-Destructive Testing (NDT) field.

The meticulously designed program provided VUT students with a comprehensive understanding of the essential role NDT plays in safeguarding the integrity and reliability of infrastructure, with a particular focus on South Africa's power generation sector.

The program embarked on a comprehensive exploration of NDT, encompassing a multitude of topics such as:

Fundamentals of NDT and Significance in the Power Industry: This session provided a foundational understanding of NDT principles and their critical role in ensuring the safety and reliability of power generation infrastructure. Students gained valuable insights into how NDT helps prevent catastrophic failures, equipment downtime, and potential safety hazards.

Implementation Strategies of NDT at Power Plants: Students gained practical knowledge of how NDT techniques are implemented within the context of power plants. They explored the specific NDT methods used at various stages of a power plant's lifecycle, from construction and commissioning to in-service inspections and maintenance outages.

Examination of NDT Processes and Methodologies: The program delved into the intricacies of various NDT methods employed in real-world scenarios, including:

Ultrasonic/Wall Thickness Testing: This method uses high-frequency sound waves to precisely measure the thickness of materials and detect internal flaws that could compromise structural integrity.

Positive Material Identification: This technique ensures components are constructed from the correct materials for optimal performance and safety. It can involve various methods, such as spark optical emission spectroscopy or X-ray fluorescence analysis.

Dye Penetrant Testing: A popular method for revealing surface-breaking cracks and discontinuities on a component's surface. A coloured dye is applied to penetrate these openings, and then a developer is used to draw the dye out, making the cracks visible for inspection.

Magnetic Particle Testing: This method effectively detects surface and near-surface cracks in ferromagnetic materials like steel. It utilises a strong magnetic field to magnetise the component, and finely divided magnetic particles are applied. These particles are attracted to areas of leakage flux, which can indicate the presence of cracks.

Phased Array UT: An advanced ultrasonic testing technique offering superior versatility and precision in flaw detection. By electronically controlling the direction and focusing of sound waves, phased array UT can inspect complex geometries and weldments more effectively than conventional ultrasonic testing.

Portable Hardness Testing: This method determines the hardness of a material at a specific location. Hardness is an essential indicator of a material's strength and wear resistance.

Radiographic Testing: This technique uses X-rays or gamma rays to create images that reveal internal defects within a material. It is particularly valuable for inspecting welds and thick components where other NDT methods may have limitations.

Kabelo Molaudzi, Key Accounts Executive at Integrity NDT Projects, stated, "We were delighted to welcome VUT students to our facility and share our knowledge of NDT. This was a valuable opportunity to showcase the practical applications of NDT and ignite a passion for this field in the upcoming generation of NDT professionals. We believe that our collaboration with VUT will be instrumental in developing a highly skilled and qualified NDT workforce in South Africa."

Underscoring Integrity NDT Projects' dedication to staying at the forefront of the NDT industry, it's noteworthy that even while hosting the VUT students, a separate team from the company is currently attending the 20th World Conference on Non-Destructive Testing (20th WCNDT) in Incheon, South Korea.

This commitment to continuous learning and staying abreast of the latest advancements in NDT on a global scale ensures that Integrity NDT Projects can provide their clients with the most effective and up-to-date NDT solutions. wn

IT: careers for everyone

IT career opportunities are so numerous and varied and that there are IT jobs and specialisations to suit everyone. This is according to speakers participating in a webinar on Careers in IT hosted by the Institute of Information Technology Professionals South Africa (IITPSA).

With unemployment rife while industries grapple with IT skills shortages, the IITPSA webinar set out to address misconceptions and encourage more young people to consider working in the IT sector.

The experts noted that 'working in IT' meant a great deal more than coding, fixing computers or installing cables.

Nyari Samushonga, CEO of WeThinkCode and 2022 IITPSA IT Personality of the Year, said: "IT has become pervasive. We are immersed in a tech world, and the building of tech is becoming for everyone too. Nobody working in IT looks like an 'IT person' anymore.

It's a myth that IT is only for the genius wonderkids with mathematical brains. With low code and AI-enabled solutions, coding is becoming another natural language. Digital technology offers puzzle pieces or a box of tools that you can use to build solutions to problems. The range of jobs you can do is endless."

Mixo Fortune Ngoveni, Co-Founder of Geekulcha, said there were still misconceptions about what a career in IT entailed. "Many young people think the only work in IT is coding and programming.

This does play a fundamental role in some fields, but there are so many other areas in the tech space too, like cybersecurity, business informatics, and testing. It's a myth that if you're in IT you can fix a printer or hack a Facebook account."

While anyone can work towards a career in IT, the speakers noted that certain attributes help candidates excel in the field.

Prof Kerry Lynn Thomson, director of the Centre for Research in Information and Cyber Security (CRICS) at Nelson Mandela University, said: "There are many IT options where you don't need pure maths to do a diploma, degree or certification. However, to choose IT as a career you should be hungry for knowledge, for meeting challenges. You must constantly upskill and learn. It's a very exciting field that is constantly changing."

Ngoveni said the most important attribute was curiosity. "Those who are curious about how things work tend to succeed. Generally, IT is about problem solving of some sort and the best candidates are those who are curious, keep trying, and ask questions," he said.

GETTING INTO IT

IITPSA President Senele Goba said it was important for young people to make an effort to learn about the various fields and opportunities in the IT sector. For example, she recommended reading IT publications to learn more.

"It's important to embrace the journey and allow ourselves to discover the new fields emerging. Read IT news platforms to learn about roles that exist, problems that exist which IT can solve, and which organisations offer training and opportunities," she said.

Nyari Samushonga
CEO of WeThinkCode

Prof Kerry-Lynn-Thomson
Director of CRICS , Nelson Mandela University

Senele Goba
IITPSA President

On the topic of what training and degree courses were necessary for careers in IT, Prof Thomson said: "Universities don't have the space for everyone or the time to upskill everyone for endless specialisation areas.

A higher education IT or computer science qualification gives you broad knowledge and a taste of areas where you might want to specialise, but you won't walk out as a specialist programmer or an AI specialist."

She noted that free or low cost courses were also available for those who could not go to university or college: "Learning isn't always cheap, but fortunately there are online courses that are more accessible, where you can explore what's available."

FINDING WORK IN IT

Prof Thomson also highlighted the importance of gaining experience. "We encourage students to look for holiday jobs and internships while they are still studying. A degree shows you have knowledge, but what companies are looking for is experience, which can be a catch 22 situation for graduates," she said.

She said formal internships were not the only way to gain practical experience, however: "Employers like to see people applying their knowledge – for example, writing a programme for a friend's business, or assisting the university running some cable. This shows you are more than the qualification – it speaks to your passion and willingness to put in the extra effort."

Prof Thomson added: "To work in IT, you don't necessarily need to go and work for a company – many of our alumni go out and start their own companies. You can create your own space within the IT industry."

Ngoveni elaborated on his own early approach to getting into the IT sector: "It can seem intimidating, but you should network as much as possible. wn

EWSETA spearheads an inter-SETA programme to boost renewable energy skills development and manufacturing at TVET Colleges

An innovative partnership led by the Energy and Water Sector Education and Training Authority (EWSETA) and the Chinese Culture and International Education Exchange Centre (CCIEEC) will strengthen the role of technical vocational education and training (TVET) colleges in South Africa's Just Energy Transition.

"This programme not only seeks to establish a comprehensive renewable energy education and industry system in the country's TVET colleges but also to enhance the international standards of South African TVET colleges over the next five to ten years," comments Mpho Mookapele, CEO of EWSETA.

At the launch function held on 31 May 2024, the programme partners bid farewell to 54 learners and six lecturers from TVET colleges who will travel to China for a year-long experiential learning programme. The learners who will be trained in the field of solar PV manufacturing are from the following TVET colleges: Elangeni TVET College (KZN), Vhembe TVET College (Limpopo), Ingwe College (Eastern Cape), South West Gauteng and Westcol TVET Colleges in Gauteng, and Northern Cape Rural TVET (Northern Cape).

In April 2024, the SETA Integrated High Impact Programme (SIHIP) was launched at the SETA Skills Conference. It outlines a series of initiatives to be undertaken by SETAs to drive collaboration and cooperation among them. This is essential to maximising the impact and effectiveness of SETA programmes towards national development goals.

The Just Energy Transition Learner and Lecturer Development Support Programme talks directly to the aims of the SIHIP in that EWSETA is partnering with the Construction Education and Training Authority (CETA) and the Food and Beverage Manufacturing SETA (FoodBev SETA) on this programme, enabling the programme to be scaled up from an initial four TVET Colleges to the participation of six TVET Colleges

EWSETA's involvement with the CCIEEC offers numerous benefits. Through the provision of high-quality trainers, curriculum development, exchange programmes, research and involvement by Chinese companies, as well as funding streams, the partnership will directly benefit not just the learners and lecturers involved but South Africa's critical power supply issues and the country's national imperatives of economic recovery and skills development.

From a long-term sustainability perspective, the development of renewable energy production lines within the TVET Colleges, where the manufacturing of solar panels, inverters and lithium batteries will be done locally, will ensure added revenue streams for the identified TVET Colleges and global competitiveness of South Africa in a market dominated by China.

These production lines will not only grow our TVET College capacity but also afford learners practical workplace opportunities, and the quality of renewable energy skills coming out of these TVET Colleges will be world-class.

The programme will leverage Chinese experience and technology in education, enhance the quality of South African TVET education through international collaboration, integrate educational programmes with industry needs, and provide students with practical skills and real-world experience.

From a skills development perspective, the programme will address critical skill shortages in renewable energy and other sectors and prepare students and educators for emerging technologies and industries.

Commenting on the benefits of international cooperation because of this programme, Dr Zhilei Lu, General Manager at the CCIEEC, says, "This innovative collaboration will strengthen educational ties between South Africa and China and facilitate cultural exchange and mutual understanding between our two countries."

"As South Africa continues to seek solutions to its ongoing energy crisis, EWSETA embraces this type of partnership because of the value it brings to our mandate of capacitating the energy sector with the required skills," concludes Mookapele. wn

Revolutionising STEM Education: A visit to CUT's Science Park - Fablab

The Central University of Technology (CUT), Eskom Expo for Young Scientists, and the South African Institute of Electrical Engineers (SAIEE) have embarked on an exciting collaboration aimed at transforming science, technology, engineering, and mathematics (STEM) education across the Free State. This initiative focuses on delivering robotics workshops and mentorship programs to primary and secondary schools, fostering a new generation of innovators, scientists and engineers.

Learners with mentors from the CUT SAIEE Student Chapter and the Chairperson of SAIEE Freestate Centre.

As part of this groundbreaking project, Tlotlanang Combined School in Thaba Nchu and Setjhaba-se-Maketse High School in Botshabelo have been selected to participate in 2024. The chosen learners are expected to design a prototype, which they will present at the Eskom Expo science fair on August 3, 2024, at CUT. To ensure the success of these promising scientists and engineers, students from the CUT Department of Electrical Engineering are providing continuous support and mentorship throughout the project.

On June 24, the learners from the schools visited the Fablab at the Central University of Technology (CUT) Science Park. This visit aimed to enhance the learners' understanding of product development using cutting-edge technology such as 3D printing and laser cutting. Gustav Barnard, the Fablab officer, delivered a comprehensive overview of 3D printing and the various methods available, while Dintwe Teboho, another Fablab officer, provided insights into laser cutting and the diverse materials that can be fabricated using this technology.

This innovative initiative aims to revolutionise STEM robotics education in the Free State by exposing learners to the latest technological advancements and providing hands-on experience and expert guidance. This collaboration equips students with essential technical skills and fosters creativity, problem-solving abilities, and a deep understanding of modern engineering practices. As these learners develop their prototypes and prepare for the upcoming science fair, they gain invaluable experience that will serve as a foundation for their future careers in engineering and technology.

In conclusion, this collaborative effort is more than just an educational program; it is a transformative journey shaping the future of STEM education in the Free State. wn

CUT Student Chapter Coca-Cola Visit

The SAIEE CUT student chapter recently took an educational trip to the Coca-Cola facility in Bloemfontein, which was a key moment in their academic experience. The organisation carefully organised this outing to offer its members a special chance to see the practical uses of electrical engineering principles in a real industrial environment up close. As the students excitedly got on the bus to Coca-Cola, there was a sense of anticipation in the air, driven by a mutual enthusiasm to discover the operations of one of the top beverage companies in the world.

By Motlaloe J Moeketsi

When the students arrived at the Coca-Cola plant, they were introduced to a realm of innovation and technology. Under the guidance of experienced tour guides, they went on an in-depth exploration of the facility, visiting production lines, quality control labs, and maintenance workshops. Students encountered the constant running machinery and complex electrical systems at every corner, providing a fascinating glimpse into the meeting point of engineering and industry.

Engaging in discussions with Coca-Cola engineers and technicians was a standout experience during the visit, offering students valuable insights into the daily challenges and successes of electrical engineering. Students gained a vast amount of knowledge that went beyond traditional classroom learning through discussions on automation, control systems, equipment maintenance, and troubleshooting.

During the tour, students were amazed by how well electrical engineering technologies were incorporated into Coca-Cola's manufacturing processes. The plant demonstrated the importance of electrical engineering in enhancing efficiency, sustainability, and product quality, from managing bottling lines to improving energy consumption with advanced lighting systems. For numerous students, observing these technologies being used was a strong validation of their academic studies, confirming the significance and pertinence of their chosen field.

As the day ended and students got on the bus to return to campus, they took with them memories of an unforgettable event and a new understanding of the real-world uses of electrical engineering in the workforce. The trip to Coca-Cola expanded their perspectives and motivated them to continue their studies with more energy and determination. This visit meant more to the SAIEE student organisation than just a field trip; it showcased their dedication to offering students well-rounded learning experiences outside the classroom, readying them to be upcoming leaders in electrical engineering. Two CUT lab technicians, Mr Mbele and Mr Phali, accompanied the students on this trip. wn

SAIEE Student Organisation Explores Industry: A Visit to Transnet in Bloemfontein

On June 3, 2024, the Central University of Technology's Free State SAIEE student organisation visited Transnet in Bloemfontein as part of an industrial tour. During the tour, students had the chance to gain direct experience of Transnet's operations and initiatives in the area. The visit gave practical insight into how their academic program is used in the real world.

The trip to Transnet was educational and motivating for the SAIEE students. They could witness the practical application of the theories they learned in the classroom. The students will surely benefit from this exposure to the industry environment in their future jobs, providing them a competitive edge in the employment market.

The Central University of Technology students showed enthusiasm for electrical engineering and a desire to learn by actively participating in various activities and conversations during the visit. They asked interesting questions and had meaningful discussions with Transnet personnel.

For the Central University of Technology SAIEE students, the industrial visit to Transnet was a fruitful and interesting experience. They gained invaluable experience in the industry, useful knowledge, and networking possibilities, which will surely help them advance as future electrical engineers.

In conclusion, the industrial visit to Transnet in Bloemfontein was a huge success. It gave SAIEE students an understanding of the exciting fusion of transportation logistics and electrical engineering. Students returned to their studies with valuable information that will influence their future goals in electrical engineering and memories of a lifelong experience. wn

Council for Geoscience: Paving the Path for Young Scientists and a Sustainable Future

As we commemorate Youth Month 2024 under the theme "Actively embracing the socioeconomic gains of our democracy," the Council for Geoscience (CGS) proudly spotlights four emerging stars within its ranks. These young scientists are advancing the geoscience field and are pivotal in addressing environmental challenges that have significant economic implications for South Africa. Their innovative work underscores CGS's commitment to being an employer of choice for the next generation of geoscientists.

Mosa Mabuza, CEO of the Council for Geoscience, remarked, "The future of South Africa is incredibly promising. Year after year, universities across the country produce top-tier scientists who are poised to make significant contributions to our economy through their innovative research and insightful recommendations. At the Council for Geoscience, we take immense pride in nurturing young talent and shaping them into key figures who will play crucial roles in decision-making and strategic planning for our nation."

Geoscience may often be overlooked in its economic impact, but our young scientists contribute to critical projects at CGS, highlighting its importance. Notably, the Carbon Capture, Utilisation, and Storage (CCUS) project, which aims to foster a low-carbon economy and reduce carbon dioxide emissions in South Africa, is a testament to our innovative efforts. This initiative is critical for creating a sustainable and economically viable future.

MEET OUR RISING STARS

Lerato Mashiloane: A University of Pretoria graduate with a BSc (Honours) in Environmental and Engineering Geology, Lerato is the youngest among our four shining stars. Her expertise in geological processes and their impact on the built environment has been instrumental in projects such as dolomite stability investigations, engineering geological mapping, and slope stability analysis. Lerato's contributions are vital as South Africa seeks to develop sustainable housing solutions for its growing population.

Lindiwe Nkabane: A recent addition to CGS, Lindiwe is a junior hydrologist with a Master's degree in Hydrology from the University of KwaZulu-Natal and is currently pursuing her PhD. Her work in the hydrology and geoscience sector is set to significantly impact research and development, enhancing our understanding of water resources and their management in South Africa.

Luzuko Chiya: Holding a Master's degree in Geology from the University of Pretoria, Luzuko is making strides in the Minerals & Energy Department at CGS. His focus on modelling and estimating base metal mineral resources is crucial for the sustainable extraction and management of South Africa's rich mineral wealth.

Minenhle Buthelezi: With a Master's in Geophysics from the University of Witwatersrand, Minenhle is dedicated to geohazard environmental projects. His mapping and mineral characterisation work, particularly in the Northern Cape province, is essential for understanding and mitigating environmental risks associated with mining activities.

"At the Council for Geoscience, we are proud to be at the forefront of scientific innovation and environmental stewardship. Our young scientists, like Lerato, Lindiwe, Luzuko, and Minenhle, exemplify the talent and dedication we nurture within our organisation. wn

SAIEE UKZN Student Chapter visits Vexila

From left: Ntuthuko Zulu (UKZN SC Junior Vice Chair), Dr Khan (KZN Center Vice Chair), Viroshnee Gounden (UKZN SC Chairperson), Mihir Singh (UKZN SC PR Manager)

On June 27th, the SAIEE UKZN Student Chapter had the incredible opportunity to visit Vexila, a leading manufacturer of composite insulators, cut-outs, and line hardware for electrical rail, transmission, and distribution overhead power line infrastructure.

Our site visit included an insightful presentation detailing Vexila's inspiring origin story, impressive product portfolio, and significant projects. This was followed by a factory tour, granting us firsthand insight into their production processes. A standout moment was when we had an exclusive look at two of their newly patented products scheduled for market release!

Overall, the trip was an absolute thrill for all the student members. We gained valuable knowledge about the industry and were truly impressed by Vexila's dedication to innovation and excellence.

A huge thank you to Vexila for hosting us and sharing their expertise, and sincere gratitude to the SAIEE KZN Centre for their support in making the visit possible. wn

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To enhance the practice of electrical engineering in South Africa and the stature of our members through knowledge, networking, influence, education and communication.

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www.saiee.org.za

Do you have the skills to succeed in the 4IR world?

The Fourth Industrial Revolution (4IR) is changing how we work by introducing new technologies that automate routine tasks. This has many benefits, including enabling workers to focus on more complex and creative work and providing new opportunities for remote work, training, and collaboration.

By Leigh-Ann Revill,
CEO and Principal at Chartall Business College

4IR can increase productivity, reduce injury incidents, and improve long-term worker well-being in labour-intensive and potentially hazardous industries like manufacturing and mining. Technological advancements make people think that we will replace people with robots. However, the reality is that the need for people does not disappear – but the skills required will inevitably shift and change. We need to ensure our people have the skills they need to take advantage of new opportunities as the journey through the Industrial Revolution continues.

ADAPT OR FALL BEHIND

Automation potential driven by 4IR will enable a shift in jobs for human workers from lower to middle tiers. Jobs that can be automated could mean that some employees will lose their jobs. However, with most changes come new opportunities. South African businesses must be bold in adopting 4IR technologies out of fear of increasing unemployment because the shift toward digital and automation is rapidly becoming essential for future competitiveness. If we adapt and adopt, we will stay caught up globally, which will have detrimental long-term economic effects.

Conversely, if we embrace 4IR, we can leverage technologies such as automation, Artificial Intelligence (AI), and the Internet of Things (IoT) to significantly increase productivity and efficiency, reduce costs, and improve profits. Decision-making abilities can be enhanced using data-driven insights to create better products and services.

SKILLING FOR THE FUTURE

As automation increasingly replaces mundane, repetitive, and low-skill jobs, we must ensure we have pipelines and processes to nurture and grow the skills we need to embrace the future. Some of the core skills required to build the engine behind a 4IR South Africa are software engineers, developers, dev-ops, AI, machine learning specialists, and data scientists. These skills need to be embedded from a primary school level by introducing basic coding and robotics skills at schools, which can be further developed through high school and tertiary institutions. This will ensure a sustainable skills pool for the future.

Other skills include those that have been traditionally termed "soft skills" but are becoming increasingly "critical skills," such as adaptability, coping with change, and emotional intelligence. These interpersonal and self-regulation skills create resilient and flexible employees who can adapt to the ever-changing global world.

It is essential to upskill and cross-skill our existing workforce to close the skills gaps beginning to emerge in the short term. The skills space is an extensive ecosystem, where not only are high-level skills vital, but several mid-level roles are being created in which lower-level workers can be upskilled and cross-skilled to perform, ensuring that 4IR does not create massive unemployment.

FILLING THE GAPS

The skills gap around high-level technology skills is a significant problem in South Africa, but we face other challenges. Ensuring that lower-level workers can continue participating in the economy is just as important.

Training and education programmes are vital, including on-the-job training in new technologies and processes and vocational training to help low-skilled workers acquire new skills in cybersecurity, data analysis, digital marketing, online courses, learnerships, apprenticeships and mentoring programmes. This can also be augmented by government-sponsored training and education programmes or public-private partnerships to upskill our labour force for 4IR.

A turnkey employment service provider can be an invaluable asset, helping businesses to identify where training and skilling are needed and facilitate this training, offering workshops, seminars, and career counselling to help individuals stay up to date with the latest skills requirements.

They can help individuals find job opportunities by connecting them with employers looking for workers with the right skills and experience and they can also provide post-employment support, including mentoring, coaching, and additional training to help individuals advance in their careers. Partnering with a turnkey employment services provider can help businesses fill the gaps and advance toward adopting 4IR.

The fourth industrial revolution is a natural progression of our advancements as humans. The fifth industrial revolution is also already on our doorstep, and it's time we start focusing on skill sets that promote agility, job flexibility, and innovation.

Let's embrace the opportunity for personal, professional, and organisational growth. wn

Modernising South Africa's electricity to end load shedding

In South Africa today, a reliable and stable electricity supply is essential for both businesses and households. However, persistent load shedding and grid instability significantly disrupt daily life and hinder economic activity.

By Herman Mare
General Manager Protection and Control at ACTOM

Last year, rolling blackouts of between six and 12 hours a day, or so-called stage 3 and stage 6 load shedding, cost the economy between R204 million and R899 million a day according to the South African Reserve Bank.

Persistent load shedding affects both businesses and households in significant ways. Businesses, especially in the manufacturing sector, suffer productivity disruptions that often result in revenue loss and can even result in job losses, while households are subjected to social disruptions, health and safety concerns and psychological stress.

Many businesses that want to continue operating during load shedding have to carry the additional burden of investing in backup power systems, such as generators and uninterrupted power supply solutions. However, for many smaller enterprises, prohibitive costs mean that this is simply not an option.

To address the country's electricity grid challenges and ensure a secure electricity generation plan, collaboration with different stakeholders, particularly through frameworks like the Integrated Resource Plan (IRP), will be key.

SHAPING THE ENERGY MIX

The IRP is essentially a roadmap for the next 20-30 years that will shape South Africa's energy mix. By collaborating with different stakeholders, players in the energy space can get diverse and valuable perspectives, which can help with planning and optimising resource allocation. However, for these plans to be realised, they must be supported by well-defined policies and frameworks.

Aligning efforts with the IRP has resulted in more sustainable solutions for grid stability and electricity generation, as suppliers and utilities are on the same page and funding and engineering resources are focused on common areas. This means that instead of solutions being pushed by a single sector of industry, they can be driven by all stakeholders towards achieving a common goal. When suppliers and utilities are aligned, we see the development and adoption of renewable energy technologies, such as battery storage systems or demand-side management software that allow existing capacity to be better utilised.

At the same time, there is also a need to upgrade infrastructure and investment in renewable energy sources as a means of mitigating load shedding and improving the reliability of the national grid. South Africa's ageing grid infrastructure often fails due to the implementation of load shedding, not only due to its current state but also because it was not designed for the number of operations it is subjected to when the electricity supply is switched off and on regularly.

PREPARE FOR THE FUTURE

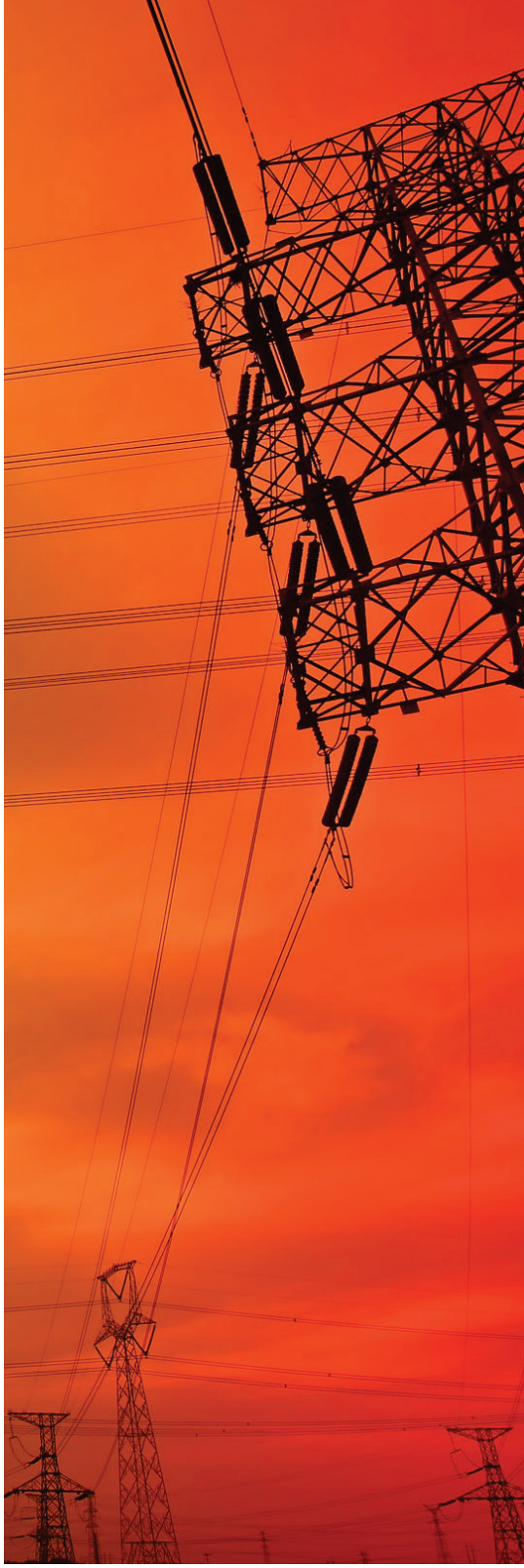
At this stage, any grid infrastructure upgrade would be welcome, almost at any level. However, upgrades must be done with renewable energy sources in mind, instead of mere like-for-like replacements. By spending a bit more

money, we can reduce our reliance on coal and prepare for future renewable energy sources. In the long run, this is a more financially efficient approach.

It is equally important to future-proof the grid against potential disruptions by ensuring that it is not reliant on a single source of energy, and this is where renewables will play a major role. Futureproofing can thus be achieved by creating redundancy and resilience.

Redundancy ensures that there are multiple energy sources and resilience is the ability to switch between them. Digitalisation and smart grid technology will ensure that switching between energy sources is automated and results in a seamless and reliable energy supply for end customers.

Ultimately, modernising South Africa's electricity grid must be done with renewables in mind. However, modernisation can only succeed if it is supported by policies and regulations such as the IRP and backed by funding that will galvanise the industry into action. wn



OPINION PIECE

Telecommunications companies need an effective talent strategy to remain sustainable and relevant

The telecommunications industry is rapidly evolving, and the skills gap this has created poses a significant challenge to businesses. The demand for highly skilled professionals continues to outpace the available talent pool, and yet, with these skills, companies will increasingly be able to remain relevant and sustainable.

By Evelyn Vanassche
Head of Recruitment at Teleresources

Addressing this challenge is not only about hiring the right talent, which is in short supply but also about mapping out plans for training and upskilling future generations. Partnering with a specialist recruiter with a deep understanding of the telecommunications market can be a crucial differentiator in navigating the skills gap and positioning for long-term growth in the rapidly evolving telecommunications industry.

THE BREAKNECK PACE OF CHANGE

One of the biggest challenges the telecommunications industry faces is how fast technology has evolved and continues to evolve. To remain relevant, competitive, and sustainable, it is essential to be able to support traditional technologies while at the same time gearing up for future solutions. It has become imperative to have a talent strategy in place to address the current skill gap and ensure that the right talent is in place to handle the future telecommunications landscape and enable South Africa to compete on a global scale.

The crux of this is understanding where you are today, where you want to be tomorrow, and what skills are needed to bridge this gap. This, in turn, requires a broad and deep understanding of the business and the industry landscape to craft a map of skills and understand what exists in the market and what will need to be trained and upskilled internally. The reality, however, is that most businesses do not have the time or expertise in talent to achieve this, which is why the right talent partner is essential.

RETENTION IS VITAL

One element of an effective talent strategy is the ability to attract the right skills, but that is only part of the picture, especially in a skills-scarce environment. It is equally important, once you have found the talent you need, to be able to retain it. The competition in the skills arena is massive; companies compete for skills, and skilled individuals are vying for the best jobs.

The best candidates are looking for the best employers, which requires them to have visibility and effectively market themselves to the talent pool. This also means that employers need to offer the best market-related salaries and have a robust environment centred on retention and loyalty. This, in turn, requires the ability to provide talent with an environment that not only meets their financial expectations but also supports career growth and offers effective succession planning.

SPECIALIST SKILLS NEED SPECIALIST RECRUITMENT

Telecommunication companies need the right talent to perform today and in the future, but talent attraction and retention are not typically core skills. This is why it pays to partner with a specialist recruiter with the expertise to identify and attract top talent who can help them find and keep the skills they need to succeed. With their market knowledge, extensive networks, and

insight into trends and technology evolution, specialist recruiters are an invaluable ally.

In addition to continuously monitoring this fast-changing industry, your recruitment partner should have a sustainable, tried-and-tested methodology for sourcing skills to meet supply and demand and ensuring candidates stay in the jobs they are placed in. They can also assist in developing training and development programmes as part of a talent roadmap to upskill and cross-skill existing employees.

TAKING A LONG-TERM VIEW

It is essential to take a long-term view when it comes to bridging the talent gap and ensuring you have a pipeline of skills for future relevance and growth. While it is true that training costs money, the reality is that it is also the most sustainable way to ensure the right skills are available. Training is an investment that should be part of strategic planning, incorporating talent transition and internal growth to expose people to new and evolving technologies and ensure their skills are up to date. Having this on top of a solid retention strategy is the key.

The keys to success are understanding the market and your skills gap and embedding talent transition, upskilling, and growth into business. Engaging with talent agencies can help telecommunications businesses in all these areas and can be hugely beneficial in ensuring organisations do not become obsolete without the ability to meet the pace of technological change. The cost of not having the right skills is much higher than partnering with the right people to help you find the talent you need. WN

OPINION PIECE

Hybrid enterprises must shift towards cyber resilience to effectively combat modern cybersecurity threats

The telecommunications industry is rapidly evolving, and the skills gap this has created poses a significant challenge to businesses. The demand for highly skilled professionals continues to outpace the available talent pool, and yet, with these skills, companies will increasingly be able to remain relevant and sustainable.

By Graham Brown
Country Manager for South Africa/SADC at Commvault

Since data is an organisation's most valuable asset, most enterprises aim to activate their data to offer insights and value to their business. However, to do this effectively, they must be able to access, manage, mobilise, protect, and secure the data.

In a legacy-heavy IT world, data lives everywhere, with vast amounts spread across an increasingly complex web of public and private clouds, endpoints, and applications.

This is mainly the result of the hybrid enterprise model that most modern organisations have adopted. Considering issues such as data sovereignty, local and global regulations, and the fact that most organisations choose a cloud-smart approach, the hybrid enterprise model will likely remain in the foreseeable future.

While the move to the cloud is unstoppable, it certainly has challenges. While organisations need the flexibility and optionality of the cloud, the journey comes with significant complexity. For instance, overlapping solutions and the need to develop new sets of skills can be chaotic – and ransomware thrives in complexity and chaos.

According to Cybersecurity Ventures, cybercrime will cost the world $9.5 trillion (R171.5 trillion) in 2024. So, what started as a business and economic nuisance has turned into a full-frontal attack on global companies, and its impact can be devastating and far-reaching.

TOP PRIORITY

Unsurprisingly, many enterprises consider their ability to recover their data and business operations following an attack their top priority. This is no longer a nice-to-have but an absolute must-have. Yet, the status quo in the data protection space needs to be revised.

Changes to data protection laws across Europe, the UK, and the USA are not only requiring organisations to have a robust recovery plan in place but also the ability to test and practice this recovery to prove that they are ready. In this respect, the status quo falls massively short.

Consequently, there is a growing gap between organisations' recovery plans and their readiness or ability to execute them. In many instances, the most a business can hope for is testing one workload or application at a time, which does not constitute readiness.

BOLD AND RADICAL APPROACH

It is becoming clear that the cyber resilience required to combat today's and tomorrow's threats requires a bold and radical new approach. As such, organisations must adopt a cyber resilience platform that can meet the complexity and demands of the hybrid enterprise. This platform must have four key capabilities or design principles to combat cyber threats:

Firstly, it must be a proper cloud-based solution. In a cloud world, one size does not fit all. Many large enterprises are choosing a cloud-smart approach – a hybrid environment that best suits their business needs. A cloud-based solution will support cloud workloads and the 75% of on-premises workloads that power most organisations today.

Secondly, security and recovery need to be integrated equally. Most cyberattacks target both the tools for recovery and the tools for security; thus, the two cannot be segregated. The general acceptance is that organisations will be breached, so it comes down to how they recover and prepare for recovery. To be resilient, they need a recovery plan and the ability to test this plan.

Thirdly, the cyber resilience solution must be powered by AI, which must be leveraged across the platform. The rapid adoption of AI has created a double-edged sword—while there is no doubt about the good it does, AI also arms bad actors with a new toolkit to breach defences.
Lastly, the cyber resilience solution must be delivered at a cost that makes sense. Businesses must be able to operate in a challenging economic climate without being crippled by the costs of their cyber resilience solutions.

The increasing threat and sophistication of cybercrime are forcing organisations to take action. Bad actors are intent on holding their data and entire businesses at ransom to stop them from operating. To effectively combat today's threats, enterprises must shift towards cyber resilience. **wn**

OPINION PIECE

AI in Check:
Don't underestimate the importance of risk management

Artificial Intelligence (AI) is rapidly becoming embedded in our everyday lives, from our apps to search engines, facial recognition, smart devices in our homes, and more. However, while AI has many applications and benefits, and businesses are exploring its use in various ways, there is also a level of risk involved, particularly regarding AI's data. Risk management around AI is critical for any business, whether you have an AI strategy or not, because AI, simply put, is everywhere.

By Ryan Boyes
Governance, Risk and Compliance Officer at Galix

GLOBAL STANDARDISATION

Having an international standard to manage the long-term risk of AI is critical, especially in light of companies like OpenAI recently disbanding their long-term risk team. The need for this is highlighted by introducing the International Standards Organisation (ISO) 42001 standard in December 2023. ISO 42001 provides organisations with best practices for governing AI effectively, with formalised standards around AI management systems and a focus on understanding the risk of AI. It offers a comprehensive approach to managing AI systems throughout their lifecycle.

While ISO 42001 is a separate standard and certification, it is also intrinsically linked to ISO 27001, the standard for information security, because AI relies on data to perform its functions. It is, therefore, only possible to effectively manage AI by addressing information management systems. Whenever anyone uses any AI system, whether part of corporate strategy or not, information is used and processed. It has become imperative that this is better understood and better managed; otherwise, organisations run the risk of information leaks, compliance breaches, and other issues around data security.

INTELLIGENCE REQUIRES INFORMATION

The reality is that AI and automation are frequently applied to information today, often without our noticing or being fully aware. For example, if you use an AI platform like ChatGPT to build a document or help construct an email, which many people do without thinking, what information are you inputting to do this? Suppose there is sensitive data like client names or company intellectual property. In that case, compliance breaches are risky, as this information is no longer under your control and could be stored, processed, and used in a way that goes against local legislation.

Even storing information in SharePoint and then using Microsoft Copilot could be problematic, as the AI servers may be located outside of your jurisdiction, which may breach laws that your company must adhere to. If there is an information breach, the potential implications could be dire. Organisations today need to be aware of how to manage the risks around AI regarding their information, which needs to form an intrinsic part of compliance and cybersecurity strategy.

NOT JUST AN IT PROBLEM

Information and information security are no longer just an IT problem; everyone uses information, which must be managed and protected effectively. From an organisational perspective, this means businesses need to be aware of what AI tools are out there and freely available, what is being used in the company, how to manage potential risk, and, importantly, where it fits in with their overall security strategy. The borders between roles and responsibilities are

blurring, and both information and compliance officers need to understand how AI is being used and ensure appropriate security controls are in place.

While becoming certified on ISO standards is not a legal requirement, they provide excellent frameworks to guide the risk mitigation process and ensure adequate, holistic information and cybersecurity strategies are in place. An experienced third-party security and risk provider can be an invaluable partner on this journey, helping businesses to understand risks and their impact, how to manage, mitigate, or accept risk, and implement the systems and controls to manage information security effectively as part of a holistic, overarching cybersecurity and cyber resilience strategy. wn

Efficiency and Convenience vs. Privacy and Safety

- The Ethical Dilemma in Smart Buildings

Smart buildings use advanced technology to optimise building operations, enhance occupant comfort and productivity, and improve energy efficiency. This is achieved through the integration of various interconnected systems and devices that can communicate with each other and be controlled centrally.

By: Matthew Taljaard, Meenal Vala, Phelokazi Ndlovu and Pieter Mocke
SAIEE Cybersecurity Chapter
csc@saiee.org.za

The key features and components are:

IOT (INTERNET OF THINGS) INTEGRATION

Smart buildings employ IoT devices like sensors, cameras, and smart meters to collect and analyse data in real time. These devices monitor various parameters such as temperature, humidity, occupancy, and energy usage to optimise building management systems (BMS)

AUTOMATION AND CONTROL

Automated systems in smart buildings manage HVAC (heating, ventilation, and air conditioning), lighting, security, and other essential building functions. These systems use data from IoT devices to make real-time adjustments, enhancing efficiency and comfort.

ENERGY EFFICIENCY

Smart buildings use advanced energy management systems to reduce consumption and improve sustainability. These systems optimise energy use by adjusting heating, cooling, and lighting based on occupancy and environmental conditions.

ENHANCED SECURITY

Security systems in smart buildings are integrated and automated, providing real-time monitoring and alerts. These systems include interconnected surveillance cameras, access control systems, and alarm systems that can be managed from a central platform.

DATA ANALYTICS (ARTIFICIAL INTELLIGENCE (AI) / MACHINE LEARNING (ML))

The data collected from various systems is analysed to provide insights into building operations. This helps in predictive maintenance, identifying inefficiencies, and making informed decisions to improve building performance.

OCCUPANT COMFORT AND PRODUCTIVITY

Smart buildings enhance occupant comfort by maintaining optimal indoor conditions and providing personalised environments. This includes adjusting lighting, temperature, and airflow based on individual preferences and occupancy patterns.

The benefits of interest and investment seem obvious notably being:

Operational Efficiency: Automated systems reduce the need for manual intervention and help maintain consistent performance.

Cost Savings: Improved energy management and operational efficiency lead to significant cost savings over time.

Sustainability: Smart buildings contribute to environmental sustainability by reducing energy consumption and carbon footprint.

Improved Security: Advanced security systems protect occupants and assets more effectively.

Enhanced Comfort: Personalised environments improve occupant comfort and productivity.

However, there are challenges and considerations, namely:

Privacy: The extensive use of sensors and surveillance can raise privacy concerns among occupants.

Cost of Implementation: The initial cost of setting up smart building systems can be high, which may be a barrier for some property owners.

Cybersecurity: As smart buildings rely heavily on interconnected systems, they are vulnerable to cyber-attacks.

Ensuring robust cybersecurity measures is crucial. Further issues include:

Complexity – Vendor mix and density of IoT devices make managing the network a complex task at scale.

Downtime – Downtime, especially sabotage, can lead to physical impact to occupants that could be a safety risk.

Visibility – Protocols could be encrypted, making third-party security solutions unable to inspect traffic.

Alternatively, some IoT protocols use no encryption, making them vulnerable to cyber attackers. Examples include:

i. **BACnet (Building Automation and Control Networks):** While newer versions of BACnet support encryption, many implementations do not enable encryption by default.
ii. **Modbus:** This protocol is widely used in industrial control systems, including smart buildings, and does not have built-in encryption.
iii. **KNX:** A popular protocol for building automation that can lack encryption if not specifically configured for secure communication.

KEY CYBERSECURITY REGULATIONS AND STANDARDS FOR SMART BUILDINGS IN SOUTH AFRICA

Smart buildings are still a new and developing area. South Africans will have to look at both relevant national laws and international best practices for guidance, namely:

Protection of Personal Information Act (POPIA) - The Protection of Personal Information Act (POPIA) is South Africa's data protection law regulating how personal information should be processed, stored, and protected. Smart buildings, which often collect and process personal data through various sensors and devices, must comply with POPIA to ensure the privacy and protection of occupants' data.

KEY PROVISIONS:

- **Consent:** Personal information must be processed with the consent of the individual.
- **Purpose Specification:** Information should only be collected for a specific, explicitly defined, and lawful purpose.
- **Information Quality:** Collected information must be accurate and kept up to date.
- **Security Safeguards:** Appropriate security measures must be in place to protect personal data from loss, damage, and unauthorised access.

Cybercrimes Act - The Cybercrimes Act aims to address various cybercrimes and provide mechanisms for investigating and prosecuting cyber offences. This act is particularly relevant to smart buildings susceptible to cyber-attacks.

KEY PROVISIONS:

- Defines cybercrimes such as unlawful access to data, interception of data, and cyber fraud.
- Establishes procedures for the reporting and investigation of cybercrimes.
- Specifies penalties for individuals and entities involved in cybercrimes.

National Cybersecurity Policy Framework (NCPF) - The NCPF outlines the South African government's strategic approach to securing cyberspace. It emphasises the need for cooperation between the public and private sectors to enhance cybersecurity.

KEY OBJECTIVES:

- Enhance the security of the national critical information infrastructure, which includes smart building technologies.

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- Promote awareness and capacity building in cybersecurity.
- Establish a national cybercrime and cybersecurity incident response team.

ISO/IEC 27001 and 27002 Standards - These international standards are widely adopted in South Africa for information security management. They provide a framework for managing and protecting sensitive information within an organisation, including the data handled by smart building systems.

KEY ELEMENTS:

- **Risk Assessment:** Identifying and assessing information security risks.
- **Information Security Policies:** Developing policies to manage security risks.
- **Access Control:** Ensuring that only authorised personnel have access to sensitive information.
- **Incident Management:** Establishing procedures to handle security breaches and incidents.

NIST Cybersecurity Framework - Although originally developed in the United States, the NIST Cybersecurity Framework is widely recognised and can be applied globally, including in South Africa. It provides a set of industry standards and best practices to help organisations manage cybersecurity risks.

CORE FUNCTIONS:

- **Identify:** Develop an understanding of managing cybersecurity risk to systems, assets, data, and capabilities.
- **Protect:** Implement appropriate safeguards to ensure the delivery of critical infrastructure services.
- **Detect:** Develop activities to identify the occurrence of a cybersecurity event.
- **Respond:** Take action regarding a detected cybersecurity incident.
- **Recover:** Maintain resilience plans and restore capabilities or services impaired by a cybersecurity incident.

Smart buildings have the potential to significantly enhance the quality of life for occupants through advanced technologies and automation. However, ensuring these technologies' safe and secure implementation comes with challenges and costs.

Currently, regulations in South Africa have not kept pace with the rapid development in this field. It is crucial for South Africans to actively voice their concerns to building owners to ensure that their safety and security are adequately addressed.

WAY FORWARD WITH SMART BUILDINGS

As a South African with the opportunity to a smart building, here are some recommendations to ensure your safety and security is being respected:

Inquire About Security Protocols: Ask building management about the specific cybersecurity measures, including encryption and regular security audits.

Regular Updates: Ensure that all smart systems and devices receive regular firmware and software updates to protect against vulnerabilities.

Data Privacy: Verify that data collected by smart systems is anonymised and securely stored in compliance with POPIA (Protection of Personal Information Act).

Incident Response Plan: Ensure the building has a clear incident response plan for cyber-attacks or data breaches.

If there is a Smart Building Infrastructure incident, it is important to understand your response, as it will likely have a physical impact.

As a South African Smart Building Owner, consider the following best practices to enhance safety and cybersecurity:

Plan for Cybersecurity: Start planning for cybersecurity as early as possible in designing the Smart Building Architecture to minimise the cost of the required cybersecurity solution.

Multi-Factor Authentication (MFA): Implementing MFA adds an extra layer of security, making it harder for unauthorised users to access management systems.

Regular Security Training: Ongoing training for employees helps them recognize potential threats and understand safe data handling practices.

Continuous Monitoring and Network Segmentation: These measures help detect and respond to unusual activities quickly, minimising the potential damage from cyber-attacks. Segmentation can also help limit the exposure of a compromised network.

Data Privacy Compliance: Adhere to POPIA guidelines by anonymising and securely storing collected data.

Incident Response Plan: Develop and maintain a comprehensive incident response plan to promptly address cyber-attacks and data breaches. This plan should also assist occupants who could be physically impacted.

By following these best practices, you can ensure a secure and resilient smart building environment. wn

This article was developed by the members of the Cybersecurity Chapter.

For more information about the Cybersecurity Chapter can be found in the April issue of the wattnow magazine.

If you are interested to join, kindly reach out to your local SAIEE representative or drop an email to csc@saiee.org.za.

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A blueprint for using AI to create smarter cities

MAPPING THE JOURNEY FROM DATA DISCOVERY TO IMPLEMENTING AI MODELS FOR URBAN USE CASES

Anyone who has been tracking the progress of artificial intelligence (AI) knows that the past year has seen the emergence of game-changing tools in the mainstream such as natural language processing (NLP) and multimodal large language models (LLM), AI-powered digital twins, convolutional neural networks (CNN) and more.

There is no doubt that such tools are bringing about the democratization of AI. What was once cost-prohibitive to all but the largest governments and enterprises is now accessible to cities, municipalities and organizations of all sizes. Similarly, outcomes that once required a team of highly skilled technical people, including specialized system integrators, data scientists, DevOps professionals and more, can now be achieved in a far more cost-efficient and effective way. Such tools are creating a world of possibilities – turning the almost impossible into possible and doing things we couldn't even imagine three years ago.

Cities are proactively seeking new ways to benefit from AI, especially as its capabilities are evolving so fast in ways we did not anticipate. This white paper puts forward a blueprint for cities to be able to take advantage of artificial intelligence to become smarter and more liveable.

It will show how technologies can deliver actionable insights to bring a variety of positive outputs and outcomes in key areas such as operational efficiency, public safety and sustainability and provide better experiences for citizens. Such capabilities can also create new monetization pipelines for municipalities – or optimise existing ones – and dramatically reduce the cost of delivering these services.

This whitepaper will show how technological solutions and services have combined to de-risk the process for cities and support them as strategic as well as technology partners in the end-to-end AI journey, turning raw data into valuable intelligence.

The blueprint is designed for those cities who want to build the AI models themselves or buy off-the-shelf pre-existing solutions – or take a hybrid approach. By methodically taking them through the process from data discovery through to implementing AI models for specific use cases, it seeks to educate cities in deciding the best approach for them, clarifying the required workflows and instilling confidence in achieving their outcomes while reducing risk.

In short, this white paper aims to provide cities with a roadmap to embedding these game-changing technologies into their daily work today and in the future.

THE IMPORTANCE OF PRIORITIZING OUTCOMES IN THE AI JOURNEY

All cities have business needs and complex challenges that they must address. The starting point of the process is to work with the city to define its desired outcomes as these will also inform and establish the workflow.

It is imperative to have clarity of purpose and alignment with overall goals and

objectives throughout the AI journey. Moreover, cities cannot ignore the risks associated with the journey if failure is to be avoided. They must map initiatives to outcomes that address real-world problems and measure and observe closely which initiatives are working and which aren't. Having measurable goals and objectives defined at the outset is key to tracking progress, performance and whether the value delivered aligns with expectations.

To create a meaningful blueprint for cities, we are focusing on two example use cases in this white paper that make use of a number of fields and subsets of AI:

- Intelligent transportation systems
- Services for residents

Intelligent transportation systems are a popular use case deployed by many cities because they have the potential to meet a number of business needs, improve efficiency and traveler experience, and deliver positive outcomes for city operations teams. For example:

- Increasing road safety through smart intersection technology and advanced detection systems.
- Improving operational efficiency by, for example, using dynamic routing technology for public transport or city fleets (there are many more applications).
- Boosting environmental sustainability through emissions reduction by optimizing traffic flow to reduce congestion. Meanwhile, smarter parking technology reduces idling time and further reduces greenhouse gas emissions.
- Increasing revenue by using number plate detection to automate the response to, for example, parking violations.
- Improving quality of life for citizens by delivering better air quality and improving opportunities for micromobility and seamless, sustainable travel options to mitigate excessive carbon emissions.
- Virtual planning by using a digital twin of the city to model and test future transit options and scenarios. A key benefit of this is around disaster and situational awareness management which is a pain point for every city. AI is delivering significant value in this area by helping cities shift from reactive to predictive operations and management.

Using generative AI for citizen services is an emerging use case that can deliver several positive outcomes, such as:

- Increased efficiency by processing transactions more rapidly and automating and streamlining processes through AI-powered systems.
- Understanding live or recorded media instantly, made possible using multimodal large language models with generative AI. Operations teams can interact with their sensor-based data and ask questions through plain text. Users can ask via text-based prompts for information. This frees up city personnel from constantly monitoring footage.
- Improving citizen experience and enhancing satisfaction by reducing waiting times with the use of intelligent chatbots to handle routine inquiries
- Optimising resource allocation, freeing up human staff from routine work to focus on more value-added citizen services
- Increasing accuracy in interactions by integrating with the city's database of citizen information.

These are just two examples but the blueprint could be similarly applied to a wide range of smart city use cases. Also, we have focused on two individual use cases but the methodology and architecture used to create them can be scaled up and out.

Having identified the outcome of the smart city use case, the next step is to fully understand the required workflows. This will vary depending on whether the city needs a customized outcome or can leverage existing outcomes delivered by readily available applications. See Fig 1.

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From data discovery to model implementation

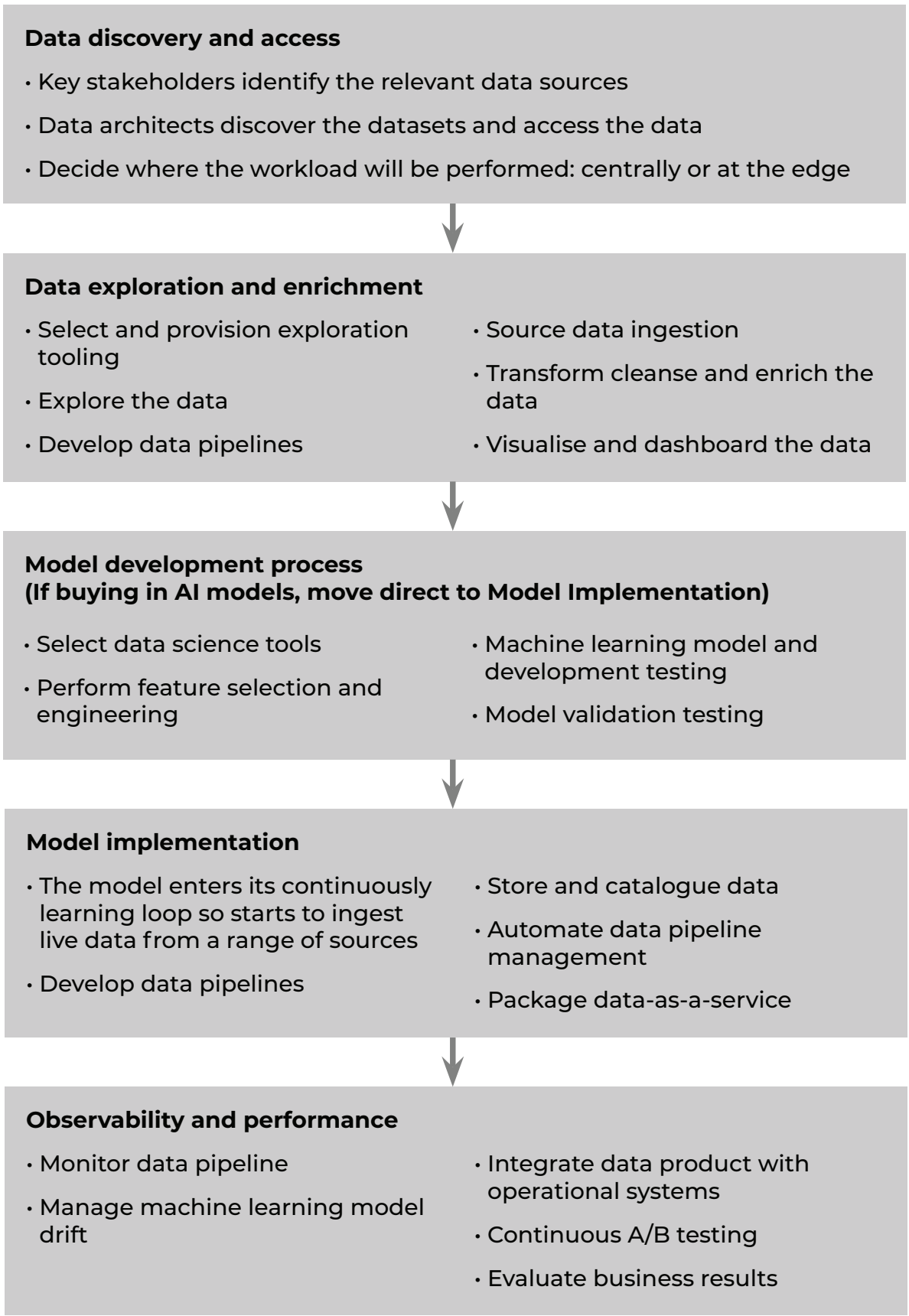

Figure 1

Given the complexities in the process and the different requirements of each city there will inevitably be some overlap and customization in the workflow. But the following journey has been mapped to take in the range of tools, techniques, technologies and services that are available to cities.

DATA DISCOVERY AND ACCESS

Whatever the use case, the starting point is to identify the data sources that will enable the city to fulfill the desired outcomes. This initial stage sets the groundwork for subsequent stages by setting out a clear pathway for handling the data.

In almost every instance there will be a range of different data streams to collect. In the case of intelligent transportation systems, data is likely to come from a host of Internet of Things (IoT) sensors and sources, including security cameras, roadside sensors, lidar and vehicle sensors, parking sensors, air quality sensors, sound detectors and more.

For residential services, data will come from internal and external databases, telecoms data, as well as some of the aforementioned city sensors that could relate to issues such as overcrowded parking lots or full waste bins.

"Cities need to collect all the data possible because they won't understand its full value until they start building their models," says Wayne Arvidson, global director of market development and strategy, Dell Technologies.

"It's often the case that a data stream a city might not have considered important takes on a new meaning when they assess the insights. Additionally, cities may not realize that they have data in silos, often associated with very specific workflows such as building infrastructure systems, or vehicle data."

Both use cases should also draw from unstructured data, such as images, social media posts, multimedia and web pages, as well as structured data. Unstructured data like this will be increasingly important, in areas like sentiment analysis, which is key to citizen services. "We've also seen customers using it to detect unconscious bias in systems and processes, which will be increasingly important in an AI-driven world," says Arvidson.

Charbel Aoun, smart city and spaces director, EMEA, at NVIDIA, similarly encourages cities to think about data in a holistic way for multiple purposes. "It is data that affords us the knowledge to make smarter cities so cities must understand its power," he says. "But cities must be interested in data beyond what they see it can do for them today."

Aoun also stresses that from the outset key stakeholders must ensure the data is collected and stored in line with regulations such as GDPR and that data privacy principles are built in throughout the workflow. "Cities must ensure they are abiding by data protection principles," he says. "Data sovereignty, encryption and compliance are all critical for cities. It's about people, processes and product."

The next step is to decide where the data will be processed: does it need to be ingested – moved or replicated – to a cloud-based server, central data lake or data warehouse or will it be processed at the edge, closer to its source? This will depend on the use case and desired outcome. If a city department is trying to optimize traffic flow and dynamically re-route one its fleet in real-time because of an incident, it will need to process data at an edge server, which could be located at an intersection. Conversely, if the city is building an AI model to power a chatbot in a city call center, it is more likely to take place in a centrally located server.

As Arvidson points out, this first stage isn't as simple as connecting data streams and "expecting the desired outcome". "Cities must consider various factors such as data format, selecting the relevant pieces for the model and ensuring alignment with the workflow objectives," he says.

CREATING DIGITAL TWINS FOR SMARTER CITIES

In the rapidly evolving landscape of urban development, digital twin technology has emerged as a powerful tool. These virtual replicas of physical assets, processes, and environments enable cities to optimize operations, enhance sustainability and improve quality of life.

Digital twins are more than just 3D models. A true digital twin is a living version of something physical and, extended to vast scales, a digital twin is an entire virtual world connected to the physical world.

Key use cases for digital twins include:

Urban planning and design: digital twins allow city planners to visualize and simulate various scenarios. From optimizing traffic patterns to designing energy-efficient buildings, these virtual models inform decision- making.

Infrastructure management: smart cities rely on efficient infrastructure. Digital twins help monitor bridges, water supply networks, and power grids. Predictive analytics can prevent failures and reduce maintenance costs.

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Energy efficiency: By modeling energy consumption across buildings, streetlights, and transportation systems, cities can identify inefficiencies and implement targeted improvements.
Environmental monitoring: digital twins track air quality, noise levels, and waste management. This data informs policies to create healthier, more sustainable urban environments.
Safety and security: creating digital twins of key government buildings, such educational facilities, can help first responders with real-time situational awareness, particularly when combined with mapping and tracking information and augmented reality.

The digital twin process is broken down into four high level areas:
Full fidelity visualization – where customers are aggregating 3D datasets in full- fidelity, adding materials, and lighting and visualizing in real-time. This requires a platform to harness open standards, like universal scene description (USD), and multi-GPU scalable compute resources to enable the user to visualize these massive scenes in real time.
Physics simulation – next, simulations of physical systems are added via real time sensor inputs, or real time simulations, through microservices.
Sensor inputs – the connection of the physical twin to the digital twin is imperative for a true digital twin simulation – constantly streaming new information from the physical twin requires connection of industrial automation, IoT sensors.
Autonomous systems – a true digital twin encompasses multiple autonomous robotic systems operating in the same space time – helping optimize and operate the virtual twin and transfer learnings to the physical twin.

As smart cities embrace digital transformation, digital twin technology becomes indispensable. With new technoligical infrastructure, we're witnessing a new era of urban planning, where virtual and physical worlds seamlessly converge.

DATA EXPLORATION AND ENRICHMENT

Cities have a number of options open to them at this stage to explore the data (looking at the structure, patterns and relationships that exist in it), and enrich it (enhancing it by adding data, context or other information from other sources). They need to understand both the system and skills challenges faced at this stage.

The starting point for both use cases requires data architects to decide which data integration process they will use to combine the data from multiple sources into a single, consistent dataset. The default method for building data pipelines is the "extract, transform and load (ETL)" approach which takes (extracts) the raw data from the different sources, cleans, aggregates and restructures it to ensure consistency (transforms) and then loads it to a database, data warehouse or data lake with search and query capability.

ETL also gives the option of carrying out feature engineering that allows data scientists to generate new features in the data that can be used in the modeling stage. ETL can also overcome latency challenges.

At this stage, data scientists can also employ the use of federated analytics, which is the ability to extract insight from different data sources without bringing data into one place for analysis. Federated analytics can act as a connective tissue to achieve certain outcomes.

Aoun highlights that it is also important to bring in the concept of RAG (Retrieval-Augmented Generation) at this stage and it's especially relevant in the case of the citizen services use case to increase accuracy. "When you use a generative AI platform like ChatGPT you are using a third-party model that is trained on a set of data up to a certain point but RAG can serve as a connector to a reliable database or data source," he explains.

So in the case of citizen services, RAG could aid a chatbot by cross-referencing the generative AI responses with verified information held on internal databases or wiki in near real-time.

A raft of tools, technologies and skills come into play at this stage and it is important for cities to assess whether they have these in-house or need to work with a partner. "There are low-code/no code tools that can do some of this work but often cities bring in data science/management consultants who may not be intimately familiar with each particular department's work or how they can achieve their outcomes," says Arvidson.

Aoun points out that there are ways to expedite this part of the process as some AI models can take up to 18 months to develop.

This is also the stage where cities can start to explore the data via dashboards and other front end visualisation tools. This helps to inform the choice of the build or buy modelling stage as these will also be the vehicles that cities use to gain insight after the models have been implemented.

MODEL DEVELOPMENT PROCESS

The model development process involves creating and refining the

model, which could be descriptive or predictive (if taking the buy approach, a city would move direct to the model implementation stage now).

To do this, cities need to make sure they choose the right data science tools and machine learning algorithms to deliver the right workflow that provides the desired outcomes. Even if a city is taking the build approach, it is advisable that cities begin by assessing if a suitable commercially available model already exists to provide the desired insights.

"Typically, we either start with one of these existing models or utilise an integrated model from a third-party applications vendor as a base and then customize it further," explains Arvidson.

For the intelligent transportation use case, cities may be looking for models capable of object identification, direction detection, traffic signal optimisation or route optimisation. These can then be integrated with natural language processing and generative AI tools to create a customized and unique algorithm.

Aoun explains that it is at this stage that the power of these latest generative tools can truly be utilized. "They move us from simply data retrieval to data generation which is really powerful," he says. "As well as expediting really complex tasks, they enable us to interact with data differently."

Similarly, in the case of citizen services, by employing natural language processing and large language models, cities can extract key themes from diverse data sources such as phone call transcripts, emails, and social media interactions. Subsequently, they can determine the specific requirements for the model, such as whether it should provide automated responses to customers. This might involve generating emails or phone calls automatically to address customer inquiries. Furthermore, they can develop interactive applications based on the insights gained.

For example, we might integrate geospatial models to offer wayfinding assistance based on the user's context," explains Arvidson.

Other options to highlight at this stage are the use of feature engineering and synthetic data, which can both help to create more robust and accurate machine learning models. Feature engineering is used to create new features and improve the accuracy of models.

For example, in an intelligent transportation system, it could create a feature that combines weather events with road surface conditions which could then be integrated in the model to predict how drivers might behave in extreme weather and the impact this would have on traffic flow.

Meanwhile, synthetic data could be used to generate more traffic scenarios to improve the model. It also has a role to play in data privacy: it could eliminate sensitive information such as license plate numbers while retaining the data's statistical properties. This could be especially useful when it comes to data-sharing.

When creating machine learning models for a chatbot for citizen services, feature engineering could create a function that can detect a citizen's feelings about a topic (whether they feel positive or negative), which in turn informs the chatbot's tone and response.

An example of using synthetic data in this use case would be training chatbots on synthetic emergency scenarios to better equip it to provide assistance at critical times.

These are just a few examples but they demonstrate the abilities and vast range of opportunities that are open to cities at this stage when it comes to modeling scenarios and training AI to deliver different outcomes. It also highlights why it is important not to limit thinking or aspirations in earlier stages of the process. Once the city is confident with the models, it can then begin to validate and test them.

MODEL IMPLEMENTATION

This is where the model moves from the development and testing environment to a real-world one. Those cities that opt for a 'buy' rather than 'build' approach will have moved to this stage directly after the data exploration and enrichment stage. In both approaches, though, this is the stage where the model is made available to all those who need to use it in the city and they can start to gain actionable insight via dashboards and other visualisation tools. From this point onwards, the model will also be using live inputs and delivering live outcomes. The model also enters its continuous learning loop, driving the retraining and redeployment of the model constantly improving accuracy and results.

OBSERVABILITY AND PERFORMANCE

This is where the model and its inputs and outputs are monitored and analyzed to gain insight on its performance and behavior via observability tools. This can be done in-house or via a third-party platform. Cities need to set specific metrics and benchmarks to measure the performance, reliability and effectiveness of the model. Moreover,

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as the model continues to be fed data, cities must ensure that they maintain their focus in areas such as data privacy data protection, and cybersecurity.

Once a city starts obtaining actionable insight from the model they begin to understand that additional insights can be derived from the data or those insights can be combined with other tools to provide new outcomes. The benefit of tools like natural language processing and generative AI is that they make it relatively easy to apply more learning and data to an algorithm to uncover more insights and information. Just as the AI model itself never stands still, then nor should the city's aspirations for what it can help them achieve.

AI TODAY AND IN THE FUTURE

Cities shouldn't underestimate the power that the latest generation of AI tools places in their hands. Embracing these technologies affords them a level of knowledge and capability that they could only have dreamt about even as recently as two years ago. They both expedite and democratise the process of building smarter, efficient, sustainable and liveable cities. Even a small municipality can now have the same capability as a federal government.

As accessible as these technologies have become, however, cities need to fully understand the road ahead if they want to implement them efficiently and cost- effectively. They need to be realistic about what they can do in-house and what technology solutions and consultancy and support services they need to buy-in.

To conclude, cities should first understand the outcomes they are trying to achieve and the tools that are needed to deliver the desired workflows. wn

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Jules Fejer
- Engineer, Radio Scientist and Ionospheric Physicist

Figure 1: Staff Sergeant Fejer in the SSS

Few people, these days, in South Africa are familiar with the name Jules Fejer. He left the country in 1959, never to return, but his contribution to the study of the ionosphere – a field in which he subsequently made enormously significant contributions – began in Johannesburg.

By: Dr Brian Austin

Fejer was born in Budapest in 1914 when the Hungary we know today was part of the Austro-Hungarian Empire. A mathematical prodigy at school, he won a National Mathematics award in 1931 and then moved to Switzerland to study Electrical Engineering at the famous Eidgennossische Technische Hochschule (ETH) in Zurich from where he graduated in 1936. On returning to Budapest, he began his career as a radio engineer. But Hitler and his Nazis were now threatening and Fejer decided to leave for a part of the world far removed from the war that was looming. He chose South Africa, arriving in Johannesburg sometime in 1939. But war followed him there and soon after South Africa declared war on Germany in early September Fejer, though technically an enemy alien, joined the highly secret and very select group of engineers and physicists who were developing South Africa's own radar at Wits. That group, under the direction of Professor Basil Schonland, soon became part of the South African Army's Corps of Signals as its ultra-secret Special Signals Services (forever after known as the SSS).

Fejer's talents had clearly impressed someone, perhaps it was G.R. Bozzoli, or 'Boz' to those of us fortunate to know him as professor in the Department of Electrical Engineering at Wits. In those very early days of the SSS radar story, Boz led the team that designed South Africa's own radar (or RDF as it was called until the Americans called it radar later on), beginning with the prototype JB0 and progressing as far as the mobile version, the JB5. Those radars saw service all around South Africa's very long coastline, in East Africa and in the Middle East and their designers were even the radar operators in some of those theatres. Jules Fejer went into uniform and was soon Staff Sergeant Fejer (Fig.1). In 1942 he was posted to the SSS radar station in Amanzimtoti (now eManzimtoti) as the technical specialist where he pointed out to the commanding officer that, in his opinion, at least half the thermionic valves in the radar's time-base were superfluous and he proceeded to redesign it. The results were impressive.

Subsequently, he teamed up with Major Trevor Wadley to run courses on the latest American-designed 3cm radars that were being fitted to certain aircraft of the SAAF. Fejer subsequently attended a course for SSS cadet officers (Fig.2). Wadley had by this time established himself as the undoubted technical wizard in the SSS but it was his subsequent collaboration with Fejer after the war that would lead to some remarkable electronic developments, most notably the Tellurometer, the microwave distance-measuring instrument of unprecedented accuracy.

Immediately after the war Schonland established the CSIR and became its first President. One of the first laboratories to be set up was the Telecommunications Research Laboratory (TRL) which shared facilities with the Electrical

Figure 2: SSS commissioning course 1942. Fejer back row far right.

Engineering Department at Wits until it moved (as the National Institute for Telecommunications Research or NITR) into its own purpose-built building on the campus some years later. Almost all the original scientific members of the TRL staff had seen wartime service in the SSS and among them were both Wadley and Fejer. The Director of the TRL/NITR was Frank Hewitt, another member of the SSS, and he recommended to Fejer that he register at Wits for a higher degree.

He was awarded the M.Sc (Eng) degree for a dissertation in the radio engineering field. In 1959 he received the D.Sc (Eng) for his world-leading published work on the ionosphere. Fejer's colleague Trevor Wadley, meanwhile, was working on a method of measuring reflections from the ionosphere using a technique he had developed during the war and which would soon form the basis for a quite revolutionary radio receiver that would become the mainstay of the Royal Navy's high-frequency communications. Wadley's ionosonde, as such ionospheric recorders are known, was operating by 1947 with recording stations set up at the TRL and in Cape Town. By 1952 a third station, using the South African-designed equipment, went into operation in Nairobi and immediately provided data from which predictions could be made of the optimum frequencies to be used for communications between southern Africa and Europe. Fejer used the equipment in an experiment that shed considerable light on the lower ionosphere at a height of around 70 km and particularly on a phenomenon known as ionospheric cross-modulation. He published a significant paper in 1955 which delineated the interaction of pulsed radio waves in the ionosphere. Then, in 1957, the Nairobi equipment was moved to Sailsbury (now Harare) where it became part of a major experimental programme as part of South Africa's contribution to the International Geophysical Year (IGY) of 1957/8.

In this work Fejer collaborated with his colleague Raymond Vice who would eventually succeed Hewitt as NITR Director. The intention was to study, by means of a transmitter in Johannesburg and a receiver in Salisbury, how pulsed signals at an appropriate oblique angle of incidence, were propagated via the ionised regions between 70 and 100 km above the earth. Of particular interest was the absorption that occurred in the lowest, or D region, of the ionosphere. Fejer provided the theoretical underpinning for this research and published two significant papers describing that work in the international literature in the following years. They became landmark publications in the field. Fig.3 shows Jules Fejer adjusting some of the equipment used during that investigation.

But 1957 was also the year in which the Soviet Union placed the world's first artificial satellite in orbit around the earth. Sputnik stunned scientists everywhere and perhaps politicians, especially in the United States, even more. Measuring Sputnik's radio signals was relatively easy and the TRL set up the necessary apparatus to do just that. Fejer took a great interest in the satellite and made very careful measurements of its decaying orbital period. He also followed the progress of the rocket that had launched Sputnik by noting the time difference between the appearance of the satellite and the

continues from page 67

period of the rocket casing as published in the scientific press. From these he was able to calculate the lifetimes of both. He published his predictions in the world's leading scientific journal Nature in December 1957 just a matter of weeks after the launch of Sputnik. This was the first prediction of the orbital lifetimes of both craft and it turned out to be remarkably accurate. Needless to say, it was a particular feather in South Africa's cap. And Fejer's too.

It was as early as 1950 that Jules Fejer first came to the attention of the research community overseas. The CSIR sent him to Cambridge for a year to work alongside a very powerful team of researchers at the Cavendish Laboratory who, at that time, led the world in the study of ionospheric radiophysics.

Fejer was soon swept up in their work. He published two classic papers on his own theoretical work: one on the diffraction of radio waves passing through an irregular diffracting medium and the other on magnetospheric physics, a new research area entirely. Needless to say, others were now noticing Fejer's significant contribution to the science of the ionosphere and it was not long before he was offered an appointment at Canada's Defence Research Telecommunications Establishment. The Fejer family left South Africa for Ottawa in 1959. While there he published a paper of fundamental importance in the field by showing that it was the ions and not the electrons in the ionosphere that affected the backscatter from those electrically charged regions some hundred kilometres and more above the earth.

In 1962 Fejer moved again. This time it was south to the United States. Initially it was to Dallas in Texas and its Centre for Advanced Studies but, soon, the call came from California. In 1965 he joined the University of California in San Diego and its new department of Applied Electrophysics. There, the most powerful team of ionospheric engineers and physicists ever to have collaborated was being assembled and Fejer soon became one of its leading theoreticians.

His contributions to our understanding of the mechanism and processes within those ionised regions of space so directly affected by the Sun and its famous 11-year cycle of sunspots were immense. Following his retirement from UCSD in 1976 he spent time in Germany and Tromso in Norway (Fig 4) where he was an adviser on the exotic experiments on ionospheric heating being undertaken in the polar regions where magnetic field phenomena were little understood.

Fejer's unending quest to understand the mysteries of space saw him accept an appointment, in 1982, at the world's largest radio telescope in Arecibo, Puerto Rico, where he directed its Atmospheric Sciences activities. He retired, finally, in 1984, and died, in California, in 2002. A remarkable scientist and a remarkably nice man too. wn

Figure 3: Jules Fejer adjusting the equipment used at the TRL to measure particle reflections, cross modulation and absorption in the ionosphere.

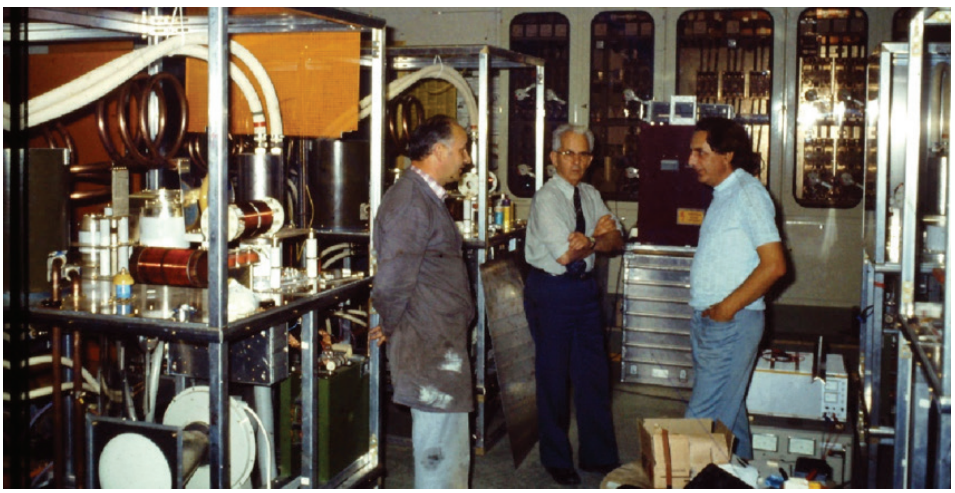

Figure 4: Dr Jules Fejer, centre, at the ionospheric heating facility in Tromso. (credit: Creative Commons).

SOUTH AFRICA INTERNATIONAL INDUSTRIAL EXPO
& CHINA (SOUTH AFRICA) INTERNATIONAL TRADE EXPO

SOUTH AFRICA GOLDEN BRIDGE

3th South Africa International Industrial Expo & China (South Africa) International Trade Expo

Expo 1 , Sandton Convention Centre,Johannesburg, SA

19 - 21 Sept, 2024

Pre-Expo Match Meetings

Golden Bridge is holding industry specialized Pre-Expo Match Meetings before the physical expo which will assist clients and exhibitors to establish contact in advance and improve the efficiency of the business negotiation during the exhibition.

Display Center & Warehouse

Located in Midrand, Golden Bridge has set up a long-term display center and overseas warehouse in Inospace Business Park with highways and the Gautrain station within walking distance. Business people are able to check the samples of settled enterprises and negotiate with them at any time. It is conducive to shortening the delivery time of products and improving trade efficiency, and it does provide the visitors with convenience in trade links such as sample check and transportation.

Factory Visits in China

Golden Bridge Expo China team will connect business people on business trips in China with factories and assist with on-site factory visits and inspections according to the needs, so as to facilitate clients to choose trustworthy business partners.

TOGETHER, GROWING INDUSTRIES

MEMBERSHIP FEES EFFECTIVE 1 DECEMBER 2023

The Council meeting held on 1 September 2023 approved subscription & entrance fees as from 01 December 2023 as per schedule indicated below.

PLEASE NOTE: In terms of Bylaw 3.2 annual subscriptions are due on 1st December 2023

MEMBERSHIP FEES CAN BE PAID IN MONTHLY RECURRING PAYMENTS

Council agreed to a discount for fees paid before 31 March 2024. Members are therefore encouraged to pay promptly to minimize increase impact.

Grade of Membership	Annual Subscriptions paid before 31 March 2024		Annual Subscriptions paid after 31 March 2024		New Members FEES * see Notes 1 & 4 below.	
	RSA incl VAT (R)	Outside RSA excl VAT (R)	RSA incl VAT (R)	Outside RSA excl VAT (R)	RSA incl VAT (R)	Outside RSA excl VAT (R)
Student	173	150	208	180	208	180
After 6 yrs study	1 800	1 565	2 160	1 878	2 160	1 878
Associate	1 800	1 565	2 160	1 878	2 160	1 878
Member	1 989	1 730	2 387	2 076	2 387	2 076
after 6 years	2 325	2 021	2 789	2 426	2 789	2 426
after 10 years	2 433	2 116	2 919	2 539	2 919	2 539
Senior Member	2 433	2 116	2 919	2 539	2 919	2 539
after 6yrs/age 40	2 637	2 293	3 164	2 751	3 164	2 751
Fellow	2 637	2 293	3 164	2 751	3 164	2 751
Retired Member (By-law B3.7.1)	1 118	972	1 342	1 167	n/a	n/a
Retired Member (By-law B3.7.3)	nil	nil	nil	nil	n/a	n/a

1. The fee for all new applications is R3337.00 which includes an entrance fee of R950.00. On election to the applicable grade of membership the new member's account will be adjusted accordingly and refunds/additional payment made on request. Entrance fee for Students is free and new Student applicants require payment of R208.00.

2. Transfer fee to a higher grade is free for all grades of membership.

3. Members are encouraged to transfer to a higher grade when they qualify. It will be noted that the fees of Member and Senior Member grades after 10 and 6 years respectively are equal to the fees of the next higher grade.

4. Members elected after May 2024 pay a reduced subscription fee.

5. By-law B3.7.1 reads “Where a member in the age group of 55 to 70 years has retired from substantive employment in the engineering profession, such member may make written application to Council for recognition as a retired person and a reduced membership fee".

6. By-law B3.7.3 reads “any member complying with the conditions of B3.7.1 but who has been a member of the Institute for not less than 25 consecutive years, shall be exempt from the payment of further subscriptions.” Members who comply with the requirements of By-Law B3.7.3 may make written application to Council for exemption from paying subscriptions".

7. By-law B3.9 reads “any member in good standing who has been a member for fifty (50) consecutive years shall be exempt from the payment of further subscriptions.”

8. Members not in good standing by failing to pay their subscriptions by end of June of each year will, subject to Council decree, be struck-off the SAIEE membership role.

9. Members in good standing and no longer in substantive employment and do not receive payment or salary for work done may apply to Council for a reduction in their annual subscriptions.

10. The members monthly magazine ("wattnow") is available on line and members who require a hard copy may acquire same on request and for a nominal fee subject to minimum uptake numbers.

11. Members who wish to pay their membership fees in recurring payments should activate the payments on their banking portal. Members will receive the early bird discount only if their fees are fully paid by 31 March 2024.

2024 SAIEE MEMBER BENEFITS

STUDENT MEMBER	ASSOCIATE MEMBER	MEMBER	SENIOR MEMBER	FELLOW
Jobs portal for WIL	Jobs portal access	Jobs portal access	Jobs portal access	Jobs portal access
Mentorship	Mentorship	Mentorship	Services Directory	Services Directory
Exclusive Networking Events	Exclusive Networking Events	Exclusive Networking Events	Mentorship	Mentorship
CPD training discounts	CPD training discounts	CPD training discounts	Exclusive Networking Events	Exclusive Networking Events
Charge Reward Programme earnings	Charge Reward Programme earnings	Charge Reward Programme earnings	CPD training discounts	CPD training discounts
Bursary programme	Bursary programme	Long standing member gifts	Charge Reward Programme earnings	Charge Reward Programme earnings
Publication access (**watt**now & ARJ)	Publication access (**watt**now & ARJ)	Bursary programme	Long standing member gifts	Long standing member gifts
Site visits	Site visits	Publication access (**watt**now & ARJ)	Bursary programme	Bursary programme
SAIEE Centres	SAIEE Centres	Site visits	Publication access (**watt**now & ARJ)	Publication access (**watt**now & ARJ)
		SAIEE Centres	Site visits	Site visits
			SAIEE Centres	SAIEE Centres
			Eligibility for nomination as Center Chair	Eligibility for nomination as Center Chair
				Eligibility for nomination as an Office Bearer

MEMBERSHIP UPGRADE DISCOUNT STRUCTURE

LENGTH OF MEMBERSHIP	DISCOUNT UPON UPGRADE
10 - 19 years	5%
20 -39 years	10%
40+ years	15%

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Power & Energy	M Soni	pesection@saiee.org.za
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JULY 2024

09/07/2024	Partial Discharge
10/07/2024	New Engineering Contract (NEC)
10/07/2024	Fundamentals of Power Distribution
16/07/2024	Introduction to 5G Communication
16/07/2024	Enhancing the Municipal Electrical Revenue Value Chain
18/07/2024	SAIEE President's Invitational Lecture
23/07/2024	Earthing & Lightning Protection - Gqeberha
23/07/2024	KZN Centre webinar: An exploratory investigation into Big Data for Grid Stability

AUGUST 2024

06/08/2024	Project Management for Engineers
13/08/2024	Planning Feasibility Studies: An Engineer's Perspective
14/08/2024	Earthing & Lightning Protection
27/08/2024	Photovoltaic Solar Systems - East London
28/08/2024	LV/MV/HV Switch Gear Operation, Safety, Maintenance and Management

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SAIEE Academy Classroom Training

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View past events & webinars on SAIEE TV here.

MZANZI MEDIA
& ENTERTAINMENT FUND

A Journey of Innovation and Impact with MMEF

In May 2023, the Mzanzi Media and Entertainment Fund (MMEF) was launched with a mission to transform South Africa's media and entertainment landscape.

Under the expert management of Unum Capital (Pty) Ltd (FSP: 564) and administration by Lifecycle Investment (Pty) Ltd (FSP: 52896), MMEF quickly established itself as a pioneering financial catalyst for the industry.

The fund targets a benchmark of Consumer Price Index (CPI) + 500 basis points, reflecting its goal of delivering substantial returns.

The First of it's Kind in South Africa

Investment Achievements

As of May 2024, MMEF has deployed R 43,150,871.92 into the production of TV series, set to premiere on major streaming platforms like Netflix and Amazon. This substantial investment underscores the fund's commitment to fostering high-quality media content and supporting the growth of South Africa's entertainment sector.

MMEF's performance has been impressive, with the fund yielding 8.69% in 2023 over just four and a half months and achieving a 7.59% return so far in 2024. For April 2024 alone, the fund reported a yield of 1.77%, demonstrating its consistent performance and robust investment strategy.

Strategic Focus and Early Success

MMEF's strategic focus is on five key revenue streams:

1. **Feature film TV Series Production:** Financing high-quality movies and series for streaming platforms like Netflix and Amazon.
2. **Media Buying:** Investing in advertising space, both digital and traditional.
3. **Outdoor Media:** Funding for billboards and other outdoor advertising mediums.
4. **Equipment Purchasing:** Providing resources for acquiring production and broadcast equipment.
5. **Infrastructure Development:** Investing in the necessary infrastructure to support media production and distribution.

By July 2023, MMEF made its first public offering, a significant milestone that allowed the fund to attract a broad range of investors. This move was part of a broader strategy to leverage deep industry insights and financial expertise to support and grow high-potential media projects.

Approval by JSE's JPP Platform

A pivotal moment in MMEF's journey was its approval on April 23, 2024, by the JSE's Johannesburg Private Placements (JPP) platform (FSP: 51709).

JPP is a strategic extension of the Johannesburg Stock Exchange (JSE), designed to facilitate private placements and connect innovative projects with investors.

This approval validates MMEF's strategic vision and opens up new avenues for raising capital, enabling the fund to attract more investments and scale its impact.

Looking Ahead

MMEF's journey from inception to its current status as a high-performing fund is a testament to its strategic focus and the expertise of its management team. The fund not only aims for financial success but also champions inclusivity and sustainability through investments aligned with Broad-Based Black Economic Empowerment (BBB-EEE) principles.

As the fund continues to grow and invest in transformative media projects, it remains dedicated to delivering exceptional returns to its investors and contributing to the vibrant cultural fabric of South Africa.

The approval by JPP further solidifies MMEF's position as a key player in the industry, providing a secure and efficient environment for high-value investments.

Join the Journey

Investors looking to be part of this exciting journey can explore the fund's latest performance and opportunities through the detailed fund fact sheet available here.

For more information or to start the investment process, please contact Unum Capital's Client Support team via phone 0113842965 / 0113842963 or email clientsupport@unum.co.za or visit the official website www.jpp.mmefund.co.za

The Mzanzi Media and Entertainment Fund is not just an investment; it's a gateway to the future of South African media and entertainment.

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