Report on the Smart City Symposium

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Background

The Smart City Symposium arose from the Northern Cape Provincial Government (NCPG) intent to transition Kimberley into a Smart City, as specified in the Provincial Growth and Development Plan (2020). Guided by the United Nations (UN) Sustainable Development Goal (SDG) 11 "striving to make cities inclusive, safe, resilient, and sustainable" and informed by the Department of Economic Development and Tourism (DEDaT) Economic Intelligence Research Report conducted by DEDaT Research and Development (R&D) sub-programme on the Smart City Concept. The DEDaT, Sol Plaatje University (SPU) and Sol Plaajte Municipality (SPM) agreed to bring together stakeholders from business, academia, government and civil society, to initiate a conversation on the concept of Smart City Kimberley.

Introduction

This Smart City collaboration between the department, university, and municipality is an effort to bridge the gap between the ecosystems of business, academia, government and civil society, by creating a platform whereby the exchange of knowledge, the sharing of experience and recognition of innovative ideas and technologies may serve to improve the economic and social sustainability of Kimberley. The symposium is intended to act as a catalyst for transformation, the sparking of new ideas and partnerships focused on the integration of technology, infrastructure, and services to enhance the quality of life for all residents and promote equitable sustainable economic development.

Smart City Symposium Programme

The Smart City Symposium provided a platform for presentations and discussions from academia, government, civil society and business. The topics revolved around the concept of Smart Cities and Knowledge Cities, the National Smart Cities Framework, Smart Townships, Smart City Technologies and alignment to the Draft Digital Economy Masterplan for South Africa. The specific programme directed by Mr Rodwyn Grewan, Senior Manager: Knowledge Economy Support, DEDaT, was represented by:

- Prof. Martin Ntwaeaborwa, Dean: Faculty of Natural and Applied Science, Sol Plaatje University (SPU)
- Mr Sam Mabilo, Executive Manager: Economic Planning, Department of Economic Development and Tourism (DEDaT)
- Dr Silas Verkijika, Acting Head: Centre for Applied Data Science, SPU
- Mr Prabin Govender, Deputy Director Spatial and Urban Development Planning, Cooperative Governance and Traditional Affairs (CoGTA)
- Ms Nomonde Tyabashe, Executive Director: Strategy, Economic Development and Planning, Sol Plaatje Municipality (SPM)
- Mr Edward Matiwane, Executive Director: Diamond Creative Vision Hub, Galeshewe SMME Village
- Mr Yao Ayivor, Senior Solutions Specialist: MTN
- Mr Thabang Mpye, Head: Information and Communications Technology, Technology Innovation Agency (TIA)

Opening

Prof. Martin Ntwaeaborwa

Prof Ntwaeaborwa a physicist in nanoscience reminded the audience that as they deliberate the good opportunities that Smart Cities present; they must not neglect to consider the potential unforeseen consequences. Prof described the example of the discovery of X-ray technology. It was only after the use of X-rays on humans that scientists found that the radiation was ionising and damaging tissue and DNA in genes. The advent of the industrial era, while changing steam into energy, was the beginning of climate change and in essence, the application of scientific discoveries requires ethical responsibility. So, all the good potential we see in Smart Cities must be balanced with the ethical considerations of potential detrimental effects to our natural ecosystems.

Welcome

Mr Sam Mabilo

Mr Sam Mabilo welcomed the presenters and all the physical and virtual participants to the Symposium. Mr Mabilo acknowledged that the Sixth Administration of Premier Zamani Saul had indicated a need to shift towards a Smart City paradigm and the national government has initiated processes to promote the Smart City model while acknowledging that the Northern Cape, with its large distances between small population densities, the approach to Smart City development needs to addresses the developmental priorities in the context of Northern Cape and in particular, the outputs of the Symposium provide an approach that will hasten the pace of the Provinces developmental trajectory.

Presentations

Smart City or Knowledge City

Dr Silas Verkijika

Dr Verkijika introduced the concepts of Smart City (SC) and Knowledge City (KC), and how we may leverage the synergies between the two concepts to create a city of the future. He stated that the definitions of SC and KC vary from the perspective of how the cities' grew from the Industrial Revolution and one definition does not fit all. SC, he elaborated focuses on Information and Communications Technologies (ICTs) and digital infrastructure to propel innovation, while the KC focuses on knowledge that is useful and beneficial to society.

However, across the various definitions of SC, six dimensions are common in the various SC frameworks:

1. Smart Environment;
2. Smart People;
3. Smart Living;
4. Smart Governance;
5. Smart Economy; and
6. Smart Mobility.

A city cannot focus on all six simultaneously but needs to make choices on where to prioritize based on its current situation. Which dimension to focus on to initiate the development of a SC, can be guided by six criteria:

1. Quality of Life;
2. Sustainability;
3. Economic Competitiveness;
4. Government Performance;
5. Civic Engagement; and
6. Digital Readiness.

Determining which criteria to prioritize on will determine where resources will be focused to shape how the SC moves forward.

A KC is not driven by technological and digital solutions, but by research, knowledge and a culture of innovation that is underpinned by a highly educated workforce, research institutions, social capital and an ICT infrastructure. An environment where knowledge focuses on developing solutions to the problems of the city and is applied to promote a virtuous cycle of innovation. Research is at the centre of the KC as it drives new solutions focused on the problems of the city. The problems of the city, however, need to be identified and prioritized through social networks that brings together the social capital required to resource the prioritized focus areas. This combination of research, knowledge and social capital rests upon a foundation ICT infrastructure which is the backbone to any SC and KC.

SC and KC are not mutually exclusive. They are different sides of the same coin with the same goals, aimed at improving the quality of life, enhancing the city's competitiveness, integrating the operations of urban infrastructure and services and promoting well-being, inclusion, participation, environmental quality and intelligent development. This symbiosis is captured as a Smart Knowledge-based City (SKC). The investments in the dimensions of the SC provide the infrastructure for the generation of new knowledge, while the investment in the KC drivers generates the new knowledge that uses the infrastructure to realise a SKC. The dimensions of the SC: Smart Environment; Smart People; Smart Living; Smart Governance; Smart Economy; and Smart Mobility generate data that empowers the drivers of the KC: research; knowledge; and a culture of innovation as exemplified in cities like Singapore, Barcelona, Washington, Beijing, Amsterdam and Brisbane. These cities have realised a SC cannot be sustained without transforming data into knowledge.

Kimberley sits at a potential advantage point where the key partners for an SKC are currently present. Namely, business, academia and government. Amongst these partners reside some prominent skills domains that need to be developed to accelerate the SKC concept- data science, artificial intelligence, robotics and automation. These domains appear to be in the realm of scientists, technologists, engineers and mathematicians (STEM) but are in fact, due to the democratization of these domains available and usable by ordinary citizens. Smart technologies generate a large amount of data which when absorbed by artificial intelligence produce data-driven applications that can enhance performance and efficiency and reveal innovative ways to use data to help improve the city.

In conclusion, Dr Verkijika highlighted some of the many use cases that exist as evidence for the basis of SKC applications from: optimizing city operations; providing personalized targeted services for citizens; crime and safety analysis; expanding labour productivity; to chatbots and virtual assistants. The infrastructure and ability to collect the data and analyse it to inform decision-making is at the foundation of the SKC. Therefore, an intentional partnership between business, government, academia and civil society is required to conceptualize and focus the prioritise for the activation of a Smart Knowledge-Based City framework for Kimberley.

Smart City Framework 2021

Mr Prabin Govender

The Department of Cooperative Governance and Traditional Affairs (CoGTA) has prepared a decision-making framework to guide the development of smart cities in South Africa, the South African Smart Cities Framework. Mr Prabin Govender presented the contents of the Smart Cities Framework and its implementation.

The Framework was developed by CoGTA and the CSIR following announcements by his Excellency President Ramaphosa in his State of the Nation Address (SONA) in 2019 and 2020, to develop a Smart City in the context of South Africa. The Framework provides a conceptual structure for our Smart Cities and shares lessons on Smart Cities and their perceived limitations. The Framework further outlines a set of principles and critical issues to guide decision-making for smart cities, and details pre-conditions and enablers to initiating Smart City interventions.

The Framework is aligned through the National Development Plan (NDP) to the Integrated Urban Development Framework (IUDF), National Spatial Development Framework (NSDF) and District Development Model (DDM), as a guide to assist provinces and municipalities in developing more detailed implementation plans appropriate to their local context. The Framework is intended to guide the creation and spread of public value through more effective data-driven decision-making; reduced environmental footprint/impact; new economic development opportunities; improved quality of life; safer communities; enhanced engagement between municipalities and residents; and cost savings.

The South African Smart Cities framework promotes six inter-dependent principles:

- Is smart for all;
- Uses technology as an enabler rather than a driver;
- Is shaped by, and responds to the local context;
- Is informed by the real needs of the community;
- Embraces innovation, partnerships and collaboration; and
- Is sustainable, resilient and safe.

These principles align with the six common dimensions of the SC concept: Smart Environment; Smart People; Smart Living; Smart Governance; Smart Economy; and Smart Mobility which are supported by the United Nations (UN) Sustainable Development Goal (SDG) eleven (11): Make cities and human settlements inclusive, safe, resilient and sustainable. Mr Govender remarked that he would confirm whether SPU is a localization partner of CoGTA in implementing the SDGs, as this opens the door for possible overseas assistance in implementing Smart City initiatives.

Mr Govender reminded the audience that the factors to be considered that should inform the planning and implementation of smart city initiatives are: The nature and purpose of a proposed smart city initiative; Alignment of smart city initiatives with existing planning and operations; and Sharing smart city experiences. These factors need to be assessed against key pre-conditions for a Smart City that include: firstly assessing whether the municipality is providing services under its current conditions i.e. whether basic services are in place. The intention is to establish whether there is a strong foundation on which to build a smart city initiative. Secondly, is to assess whether the municipality has the means and ability (or can acquire the ability) to harness and leverage smart technologies and initiatives to improve the effectiveness and efficiency of the services delivered.

The Department of CoGTA is currently adopting the Smart City Framework through the planning and implementation of the eastern seaboard development. These municipalities have undertaken necessary specialist studies and are preparing their Master Plans. CoGTA has developed targets and indicators to assist the municipalities in monitoring and evaluating the implementation of their Smart City initiatives. In the 2024/25 FY, CoGTA is planning to support five (5) to eight (8) towns with the development of plans for redesign and refurbishment into smart cities and towns, including the development of support programmes and digital twins using 3D models.

Mr Govender highlighted three pilots CoGTA are undertaking as part of the CoGTA Small Town Regeneration programme. CoGTA has appointed Urban Design to assist in preparing Smart City proposals for a key node/precinct in Piketberg, in the Western, Modimolle in Limpopo and Senekal in the Free State. The Smart City proposals will be defined according to the particular niche of the selected precinct. 3D models will be created for more detail and to inform the planning of the Smart City intervention at a small scale. This will be scaled as implementation proves successful.

Mr Govender concluded in responding to questions from participants that collaboration between role-players and stakeholders is essential to prepare a plan that focuses on what the local Smart City wants to achieve. Whether it be in coordinating the build around a knowledge precinct ecosystem, or a specific infrastructural issue. A starting point is to clearly define the roles of the stakeholders and leverage coordinated relationships between national, provincial and local government and business, academia and civil society for effective collaboration.

Sol Plaatje Municipality City Planning

Ms Nomonde Tyabashe

Ms Tyabashe welcomed the engagement of the Smart City Framework (SCF). She recognised that while Sol Plaatje Municipality (SPM) has included Smart Municipality in their Integrated Development Plan (IDP). The practical considerations within the dimensions of the SCF for SPM, included considerations on whether SPM has the capacity, digital infrastructure and institutional relationships to focus on where to start and how to implement the SCF. SPM is geographically strategically located in the centre of South Africa and is intent on transitioning from a mining town to a knowledge-based economy, due in large part to its main tenant now being Sol Plaatje University since the withdrawal of De Beers. Ms Tyabashe also noted the historical significance of Kimberley also plays a large part in promoting it as a tourist destination.

Ms Tyabashe's presentation outlined SPMs understanding of the Smart City concept in the context of the spatial frameworks of SPM's city planning as aligned to the principles of the Spatial Planning Land Use Management Act (SPLUMA) and the SCF:

SPLUMA PRINCIPLES	SMART CITY PRINCIPLES
Spatial Justice	Social Equity and Inclusion Citizen Engagement Platforms
Spatial Sustainability	Data Analytics (ability to collect, analyze, and interpret data from various sources to make informed decisions)
Spatial Efficiency	Smart grid to optimise energy and smart waste management, digital system to improve productivity
Spatial Resilience	Intelligent traffic management systems, security, Connectivity (Widespread access to high-speed internet)
Good Administration	Governance and Leadership (collaboration between public and private sectors.)

SPM has initiated some conceptual innovations to achieve a Smart City and welcomes the Symposium as an opportunity to strengthen relationships with SPU and stakeholders, in order to accurately research the potential SC nodes and develop collaborative partnerships for their implementation. SPM is benchmarking with Cities like Amsterdam, Singapore and Dubai, recognised as "World Leaders in SMART CITY DEVELOPMENT" and nationally with the City of Cape Town, on ease of doing business and digital innovations. Current SPM SC implementations include Town Planning Management Systems and Building Plans Management Systems.

The SPM IDP articulates its spatial vision as "A Resilient Gateway City with Innovation and Heritage" and the City's vision "Towards a Cleaner Growing City" to be reflective of the city's intent to be a Smart City that is clean in its physical space and administrative processes. SPM's articulation of its SC goals and objectives and captured in the SC definition by Dameri (2013): "Smart City is a well-defined geographical area, in which advanced technologies such as ICT, logistics, energy production, and so on, cooperate to create benefits for citizens in terms of prosperity, inclusion and participation, environmental quality and intelligent development".

For SPM, their initial focus of SC interventions is on smart governance, economy, infrastructure and buildings. Some SC concepts currently in the early stages of conceptualization, testing and needing further research include Digital Services and Economic Development; Utilities and Infrastructure; Efficient transport Systems; and Public Safety. The SPM Spatial Development Framework (SDF) has encapsulated the SC concept in its spatial planning categories, in particular:

- Category 1: Foster a unique sense of place within the Sol Plaatje Municipality - Central Area Revitalisation. - Strengthening Sol Plaatje's Technological Network within the CBD, particularly the Knowledge Economy.
- Category 6: Promotion of Renewable Energy- Promotion of low carbon footprint and greenery.

The spatial categories fall within nodal/precinct areas of which Ms Tyabashe demonstrated one of them using the area demarcated as the University Precinct. The precinct is relatively high in urban densification, providing an area where the SC concepts can be used to address issues such as climate change through the promotion of renewable energy, bicycling and walking paths and public safety through the use of CCTV, and connectivity through WiFi hotspot areas. Further urban plans demonstrated potential projects for non-motorised transportation systems and deployment of WiFi hotspots.

In moving forward with the implementation of the SC concept, SPM highlighted smart efficient energy and building information management systems are required for building plan approval. In Galeshewe, an informal traders hub serving local cuisine has been established using alternative building materials to grow the local economic activity. SPM currently has several proposals which fall within the SC framework and include electronic water and electricity readers, online citizen information updating and integration of online payment systems. Ultimately, more research, collaboration and partnerships is required to realise the vision of the SPM IDP in the Fourth Industrial Revolution (4IR) era.

Smart Township

Mr Edward Matiwane

Mr Matiwane recognised that the history of South Africa presents a level of complexity due to the enforced segregation system that established townships as locations for inexpensive migratory labour. Within the new democracy, however, townships have found a vitality of their own supported by multiple efforts to mainstream what were once neglected communities. Mr Matiwane described a Smart township, as an urban area that utilizes information and communication technologies (ICT) to enhance the quality of life for its residents and improve efficiencies using digital technologies.

In preparing a plan for a Smart Township, Mr Matiwane proposed that three fundamentals need to be in place that should be owned and driven by local businesses: 1. Connectivity and ICT infrastructure; 2. Engagement with relevant applications and apps to operationalise the Smart Township; 3. The user experience is qualified and quantified through big data, predictive analysis and Artificial Intelligence (AI). Some of the social and economic enterprises in Galeshewe have launch various initiatives that are contributing to building the Smart Township: Some of these initiatives include:

- Abantu Wifi Hotspot: a free public wifi project that aims to bridge the digital divide by providing fast reliable internet access to communities. Almost twenty (20) Hotspots are live across the Township and City.
- Kasi Deliveries: a local food order mobile application that allows users to order food from local Galeshewe food outlets.
- Digital Ticket (DigiTicket): a Northern Cape Tourism Mobile Application that enables users to access local tourism information. This app is being implemented with Sol Plaatje Municipality and is planned to be available on the Municipality website and the Google Play store.
- The Safe Smart City Project aims to enhance safety and connectivity within the community by deploying a network of surveillance cameras and providing free Wi-Fi access.

A burgeoning local tech ecosystem, supported by the public sector, scholars and academics and some private businesses is providing momentum to the local tech ecosystems. Some notable local establishments are the NCDev App Developer ecosystem, the mLab NC and the local entrepreneurs they develop, who are promoting digital literacy in the community and schools. Mr Matiwane concluded that while small pockets of talent are emerging, much work still needs to be done in linking the developers to the economic and social value chains that could benefit from the use of the Smart Township talent pool.

Digital Twins

Mr Yao Ayivor

Mr Yao Ayivor was joined by his colleague Mr Vutivi Mbumbi to demonstrate what MTN has developed to implement actual components of the Smart City vision. Leveraging MTN's prowess in the telecommunications space, they have built various platforms from which to transition the company into the techno space. These platforms include FinTech solutions, Digital Services, Enterprise Services, Networks as a Service (NaaS) and an API (Application Programming Interface) marketplace. Essentially access through one network to one data lake through one API that enables Data-driven applications, Datafication, IOT (Internet of Things) and Big Data for Spazza Shops, Agriculture, and Education, amongst other to create jobs in high-skill domains.

MTN through its six Enterprise Solution Pillars Mobility, Managed Networks, Unified Communications, Cloud Communication, Security as a Service and IoT supported by ICT platforms for hybrid cloud, IoT, M2M Solutions and Enterprise Security, provided through the State Information Technology Agency (SITA) RT15-2021 Transversal contract, allow for all entities of state to utilise the contract for mobile communication services, to further assist with cost containment. MTN's ambitions to lead progress for Africa using digital solutions are aligned with the United Nations (UN) Sustainable Development Goals (SDGs): Quality education (SDG 4), Gender equality (SDG 5), Affordable and clean energy (SDG 7), Decent work and economic growth (SDG 8), Industry, innovation and infrastructure (SDG 9), Reduced inequalities (SDG 10), Responsible consumption and production (SDG 12), Climate action (SDG 13), and strong institutions (SDG 16), and Partnerships for the goals (SDG 17).

Mr Ayivor screened a video illustrating a Kimberley where every street, building, and system is interconnected not just through the physical infrastructure, but through a seamless digital network that creates a digital counterpart of the real-world entity in detail. Capturing its physical characteristics, behaviours, and performance metrics in real-time or near real-time, so that organizations can monitor, analyze and optimize the performance of physical assets and processes for better decision-making, predictive maintenance and overall efficiency. Digital Twins are typically created using data collected from sensors, IoT devices, and other sources, which are then processed and analysed to generate an accurate digitally simulated twin.

The MTN vision for Smart City Kimberley was practically demonstrated by Indrian and Andre, through a "manager-of-managers platform" that collects real-time data of local assets, into a digital model. Collaborating with clients and partners, MTN has the tools available to create a Digital Twin of any asset, by installing a device and a sim card that effectively provides real-time data on the asset. Any asset whether a dam, a pipe, a building, a solar panel, an ATM, a bus, a network… live information about the asset can be accessed within the platform. The platform effectively provides a Digital Twin of the asset(s) in the organisation's ecosystem that is drillable down into granular detail, thereby providing critical information from the ecosystem's devices' data in real time. The Digital Twin is more than a visual representation as the system can be integrated with existing assets and configured to automatically take action, and send alerts to the relevant authority, when the asset is not operating within its configured parameters.

Mr Ayivor concluded the MTN Digital Twins presentation with an offer to collaborate with relevant Kimberley partners, to develop an implementation of the platform integrated with local service providers services in one of the precincts of the municipality. The platform can be hosted in the MTN cloud or locally.

The Opportunity for Young Innovators and Tech Startups in the Smart City Vision

Mr Thabang Mpye

Mr Mpye introduced the Technology Innovation Agency (TIA), an agency of the Department of Science and Innovation, mandated to promote the development and exploitation, in the public interest, of discoveries, inventions, innovations and improvements as articulated in the Technology Innovation Act (Act 26 of 2008). The objective of TIA is to support the State in stimulating and intensifying technological innovation to improve economic growth and the quality of life of all South Africans by developing and exploiting technological innovations. The priorities of TIA are aligned to the United Nations (UN) Sustainable Development Goals (SDGs), the National Development Plan (NDP) and the South African National System of Innovation.

The thematic focus areas of the DSI Decadal Plan: Circular Economy; Education for the Future; Sustainable Energy; Future of Society; Health Innovation; High-tech Industrialisation; ICTs and Smart Systems; Nutrition Security; Water Security; Agriculture; Mining; Manufacturing; Health Innovation; High-tech industries (e.g. Bio-innovation); Circular economy; and Digital Economy guide the work of TIA. Areas of priority focus include agriculture, mining, manufacturing and health informatics with ICTs and Smart Systems underpinning the Digital Economy. TIA recognises ICTs as a cross-cutter across all sectors impacted by the Digital Economy.

One of TIA's key performance indicators is to balance their targeted investments in the more under-serviced Provinces such as the Northern Cape, Eastern Cape, Free State and Limpopo. Through collaborative efforts with institutions such as the University, municipality and business. TIAs portfolio of investments target deep tech innovation in AI, cloud and devices at an average of ten million rands per investment. Support to innovators and entrepreneurs is in the form of a conditional grant targeted at de-risking the proof-of-concept with the relevant partner, up to market entrance. Once the product gains market traction, the entrepreneur/innovator is expected to pay a levy as the financial support comes from the country's taxpayer base. For market penetration and scaling, TIA assists entrepreneurs/innovators in accessing support from other agencies such as the IDC.

Mr Mpye highlighted that one of South Africa's primary challenges is youth unemployment. However, the shift in the economy from mining and agriculture to services does present a low-hanging opportunity for youth to develop apps that are relevant to their communities. With the right partnerships between academia, government, business and the entrepreneurs and innovators. This potential to prioritise publicly funded technology to be intellectually protected is a model well used by developed nations to grow their local economies and international presence. Mr Mpye elaborated that the Draft Digital Economy Masterplan envisions that digital solutions will become a major part of our lives and present enormous opportunities for South Africa to charter a new digital-driven development path.

Mr Mpye concluded with the example of the TIA and National Research Foundation (NRF) investment in Tsolo. South Africa's first cloud computing and data storage manufacturing company. Founded in 2018 by a team of engineers and developers who met while working at the South African Radio Astronomy Observatory (SARAO) on the MeerKAT project. Mr Mpye emphasised bringing together world-class skills in hardware and software design, from academia and entrepreneurs with business, we can build a local portfolio of cutting-edge computing products with an unprecedented level of local content.

Conclusion

The Symposium featured presentations from academia, government, business and civil society to underscore the importance of a coordinated collaborative partnership to define and plan a Smart Knowledge City intervention for Kimberley. It represented a forward-thinking endeavour to harness technology for the sustainable advancement of the city. Aligned to the SDGs and national frameworks where global trends are reflecting a move towards more efficient, responsive, and sustainable urban living. The Smart City Symposium covered a range of topics pertinent to the development of a smart city within the context of South Africa. Some of the specific themes that emerged from the Symposium include:

- The integration of technology to enhance efficiency, sustainability, and quality of life must be in balance with the natural harmony of the environment to offset any potential unforeseen detrimental effects to our natural ecosystems.
- To improve the quality of life for citizens, increase city competitiveness, integrate urban infrastructure and promote sustainability. A combination of good governance, ethical leadership, knowledge, and advanced ICTs, including IoT, AI, broadband connectivity and big data are necessary to enhance urban services, improve efficiency, and promote sustainability.
- A comprehensive approach to assessing the municipality’s readiness, planning and capacity to implement smart city interventions.
- The need for collaboration and learning from other cities' experiences to tailor solutions that fit the Kimberley context.
- Capacity building and support from various government institutions and levels, to effectively implement defined priority smart city projects.
- Build a Digital Twin of one of the municipality's nodal precincts to demonstrate the efficacy of a virtual model that provides real-time data for better decision-making, predictive maintenance, and overall efficiency improvements.
- Adapt existing projects such as smart efficient energy and building information management systems, Abantu Wifi Hotspot, Kasi Deliveries, NC Tourism App, and public safety, amongst others to provide digital access and data for Smart Knowledge City Digital twin.
- Leverage intellectual know-how from entrepreneurs, businesses, academia, and government-sponsored research for strategic collaborations, to prepare sustainable energy, health innovation, high-tech industrialisation, water security, and ICTs for smart systems implementation in the Smart Knowledge City Kimberley.
- Formation of Smart Knowledge City Kimberley Project Committee.

Attachments

Presentations

Presentation: Smart City or Knowledge. Smart + Knowledge: Cities of the Future

Presentation: Smart City Framework

Presentation: Smart Cities - City Planning

Presentation: Smart Township

Presentation: MTN Digital Twins

Presentation: TIA ICT 2024-25

Supporting Documents

Smart City Symposium Terms of Reference

Quarter 2 – 2023 Economic Intelligence Report: Smart City Concept

Attendance Register: Smart City Symposium

No	Username	Name and Surname	Gender	Age group	Department/Institution/Organization/Community	District
1	rgrewan@ncpg.gov.za	Rodwyn Grewan	Male	60+	NC Department of Economic Development and Tourism	Frances Baard
2	dmcanda7@gmail.com	Dominique McAnda	Female	36-59	McGregor Museum	Frances Baard
3	gbothaotp1@gmail.com	Gerrit Botha	Male	18-35	Northern Cape Office of the Premier	Northern Cape Province
4	gopane@soma-solutions.co.za	Thuto gopane	Female	18-35	Soma Solutions	Gauteng Province
5	calvinsmith691@gmail.com	Calvin Smith	Male	18-35	Northern Cape Office of the Premier	Frances Baard
6	BaratiM@ncpg.gov.za	Barati Moncho	Female	36-59	Northern Cape Office of the Premier	Frances Baard
7	lbitterbosotp1@gmail.com	Lorraine Bitterbos	Female	36-59	Northern Cape Office of the Premier	Frances Baard
8	mlouw@icasa.org.za	Moruakgomo Louw	Male	36-59	Independent Communications Authority of South Africa Northern Cape	Northern Cape
9	jerome.jacobs@spu.ac.za	Jerome Jacobs	Male	18-35	Northern Cape Innovation Forum	ZF Mgcawu
10	mochekutshepiso@gmail.com	Tshepiso Mocheku	Male	18-35	ICASA	Northern Cape
11	kabelomzolo@lathithaict.co.za	Kabelo Mzolo	Male	36-59	SMME - Lathitha ICT CC	Frances Baard
12	tlhogi.goeieman@mtn.com	Tlhogi Goeieman	Male	36-59	MTN SA	Frances Baard
13	rtshikororo@solplaatje.org.za	Rudzani Tshikororo	Male	36-59	Sol Plaatje Municipality	Frances Baard

14	tngamole@ncpg.gov.za	Tebogo Ngamole	Male	36-59	NC Department of Economic Development and Tourism	Frances Baard
15	future@codesmart.co.za	Johnson Mosikare	Male	36-59	Codesmart	Frances Baard
16	louwdarrell96@gmail.com	Darrell Louw	Male	36-59	Black Management Forum (BMF) Northern Cape	Frances Baard
17	rneyers@salga.org.za	Reyaaz Meyer	Male	36-59	SALGA	Frances Baard
18	moremikabelo33@gmail.com	Kabelo Moremi	Male	36-59	Northern Cape Office of the Premier	Frances Baard
19	cwax@ncpg.gov.za	Colette Wax	Female	36-59	NC Department of Economic Development and Tourism	Frances Baard
20	anthony.macminn@spu.ac.za	Anthony Mac Minn	Male	36-59	SPU Centre for Entrepreneurship & Rapid Incubator	ZF Mgcawu
21	tebohob056@gmail.com	Teboho Mokoena	Male	18-35	Kimberley Academy of Excellence	Frances Baard
22	mokaeo@gmail.com	Oaitse Mokae	Female	18-35	Northern Cape Office of the Premier	Frances Baard
23	yao.ayivor@mtn.com	Yao Ayivor	Male	36-59	MTN Business	JHB
24	vmpekula@solplaatje.org.za	Vuyelwa Mpekula	Female	36-59	Sol Plaatje Municipality	Frances Baard
25	Palesamoc@yahoo.com	Palesa Mocwane	Female	36-59	NC Department Of Economic Development and Toursim	Frances Baard
26	dmaganga@ncpg.gov.za	Mhlangabezi Desmond Maganga	Male	36-59	NC Department of Economic Development and Tourism	ZF Mgcawu
27	nicromano.liebenberg@sita.co.za	Nicromano Liebenberg	Male	36-59	SITA	Frances Baard
28	kenkosi74@gmail.com	Keneilwe Nkosi	Female	36-59	NC Department of Economic Development and Tourism	Frances Baard

29	felix.mokoena@mtn.com	Felix Mokoena	Male	36-59	MTN	All 5 Districts
30	sharon@nocci.co.za	Sharon Steyn NOCCI CEO	Female	60+	NOCCI	Frances Baard
31	smabilo@gmail.com	Gopane Mabilo	Male	36-59	NC Department of Economic Development and Tourism	Frances Baard
32	babalwandaku.92@gmail.com	Baba Ndaku	Female	18-35	Umvuselelo Holdings	Frances Baard
33	jose.camacho@mi-c3.com	Jose Camacho	Male	36-59	MI - C3	Gauteng
34	vuyo@digifyafrica.com	Vuyo Kumalo	Male	18-35	Digify Africa	Frances Baard
35	vutivi.mbumbi@mtn.com	Vutivi Mbumbi	Male	18-35	MTN	Gauteng Tshwane
36	sarilene.hancock@mtn.com	Sarilene Hancock	Female	36-59	MTN	Frances Baard
37	indiran@redbridge.co.za	Indiran Pillay	Male	36-59	RedBridge Management Services (Pty) Ltd	Gauteng
38	mandelabmf@gmail.com	Mandela Mathebula	Male	36-59	Okgetile group	Frances Baard
39	emphatsoane@ncpg.gov.za	Eugene Mphatsoane	Male	18-35	NC Department Of Economic Development and Toursim	Frances Baard
40	future@codesmart.co.za	Tumelo Mosikore	Male	36-59	Codesmart	Frances Baard
41	vuyiswa.mpata@spu.ac.za	Vuyiswa Mpata	Female	18-35	Sol Plaatje University	Frances Baard
42	prabinG@cogta.gov.za	Prabin Governder	Male	18-35	NC Department of Cooperative Governance & Traditional Affairs	Frances Baard
43	sabata@joxicraft.co.za	Sabata Meerotlhe	Male	36-59	Joxicraft	Frances Baard
44		David Seeletsa	Male	36-59	SITA	Frances Baard
45	thabang.mpye@tia.org.za	Thabang Mpye	Male	36-59	TIA - Department of Science & Innovation	Frances Baard

46	npaulse@ncpg.gov.za	Nadia Paulse	Female	18-36	NC Department Of Economic Development and Toursim	Frances Baard
47	martin.ntwaebowa@spu.ac.za	Martin Ntwaebowa	Male	36-59	Sol Plaatje University	Frances Baard
48	silas.verkijika@spu.ac.za	Silas Verkijika	Male	36-59	Sol Plaatje University	Frances Baard
49	eva.mamabolo@spu.ac.za	Eva Mamabolo	Female	36-59	Sol Plaatje University	Frances Baard
50	mamapule.siyabonga@spu.ac.za	Siyabonga Mampule	Male	18-35	Sol Plaatje University	Frances Baard
51	ematwane@dcvhsa.co.za	Edward Matwane	Male	36-59	DCVH	Frances Baard
52	tissacs@dcvhsa.co.za	Tumelo Isaacs	Male	36-59	DCVH	Frances Baard
53	creston@ncdevecosystem.co.za	Creston Campher	Male	18-35	NCDEV	Frances Baard
54	editor@africancontractor.co.za	Mr K. Rapodile	Male	18-35	African Contractor.com	Frances Baard
55	shounv998@gmail.com	Vusumuzi Ngobese	Male	18-35	Syntaxera	Frances Baard
56	keomodise05@gmail.com	Keotshepile Modise	Male	18-35	Sol Plaatje University	Frances Baard
57	tfmazimba053@gmail.com	Thulani Mazimba	Male	36-59	MITS	Frances Baard
58	misskoope@gmail.com	Frellet Koope	Female	18-35	Frellets Pictures	Frances Baard
59	tumelomodise25@gmail.com	Tumelo Modise	Male	18-35	Oregen Group (Pty)Ltd.	Frances Baard
60	baloungqhotsokooe@gmail.com	Baloung Qhotsokooe	Male	18-35	NC Computer Club	