STRATHMORE RESEARCH AND CONSULTANCY CENTRE LIMITED (SRCC)

BRAIN.

TECHNICAL PROPOSAL

AFRICAN DEEPTECH ECOSYSTEM MAPPING STUDY

September 22nd, 2023

STRATHMORE RESEARCH AND CONSULTANCY CENTRE LTD
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PROPOSAL COVER LETTER

Nairobi, 22nd September 2023

To: Yesmine Mansar, BRAIN Program Manager
Yesmine.Mansar@open-startup.org

Dear Sir/Madam:

We, the undersigned, are honoured to submit our proposal to offer consulting services for the African DeepTech Ecosystem Mapping Study, in line with your Terms of Reference (ToR).

Given the complexity and depth of the task at hand, we propose to execute and complete the assignment within a span of 6 months. Please be assured that both our technical and financial proposals will remain valid for 120 days from the date of 25th August 2022.

Enclosed, you'll find our comprehensive proposal, which encompasses a detailed technical approach and our financial proposal. By appending our signature below, we attest to the completeness and accuracy of our submission, inclusive of all required attachments and information.

We remain,

Yours sincerely,

Emmanuel Kweyu - Deputy Director, @iLabAfrica
Strathmore Research and Consultancy Centre (SRCC)
Keri Road, Madaraka Estate
P.O. Box 59857-00200
Mobile: +254 717730466
Email: ekweyu@strathmore.edu

TABLE OF CONTENTS

1.0 COMPANY PROFILE

1.1 Consultant's Background Information

The **African DeepTech Ecosystem Mapping Study** shall be provided by the **@iLabAfrica - Strathmore University** through **Strathmore Research and Consultancy Centre (SRCC) Limited**. SRCC was established in 2002 and has operated since 2003. SRCC functions as the consulting division of Strathmore University and is recognized as a Limited Liability Company according to the Companies Act (2015) of Kenya. Its role involves coordinating consultancy endeavours from the university to ensure clients receive top-quality services within standard commercial frameworks.

@iLabAfrica, Strathmore University's Centre of Excellence in ICT Innovation and Development, was founded in January 2011. Its primary objectives are aligned with the Millennium Development Goals (MDGs), the 2030 Sustainable Development Goals (SDGs), and Kenya's Vision 2030.

@iLabAfrica Centre is made up of the following Research Units: • Digital Learning Unit • e-Health Unit • Cybersecurity Unit • Data Science and Analytics Unit • Internet of Things (IoT) Unit and • Outsourcing and Consulting Unit. This assignment shall be implemented by the IT Outsourcing Unit which has a wealth of experience in implementing similar assignments.

@iLabAfrica is managed by a director and a deputy director, who both report to the University Council of Strathmore University. @iLabAfrica has a dynamic and innovative team of over 70 members comprising experienced researchers, project managers and software developers with a rich inter-disciplinary mix of skills. The organization is structured into several teams with each team being headed by a manager as shown in the Table below:

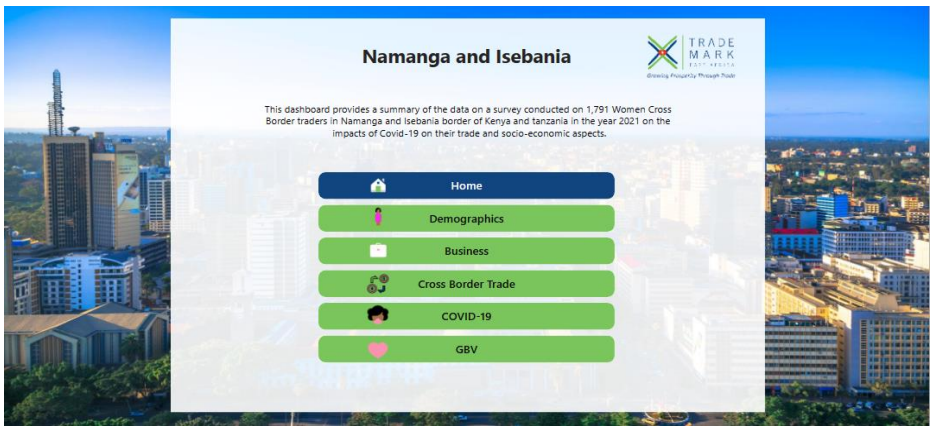
The Organizational Structure of @iLabAfrica

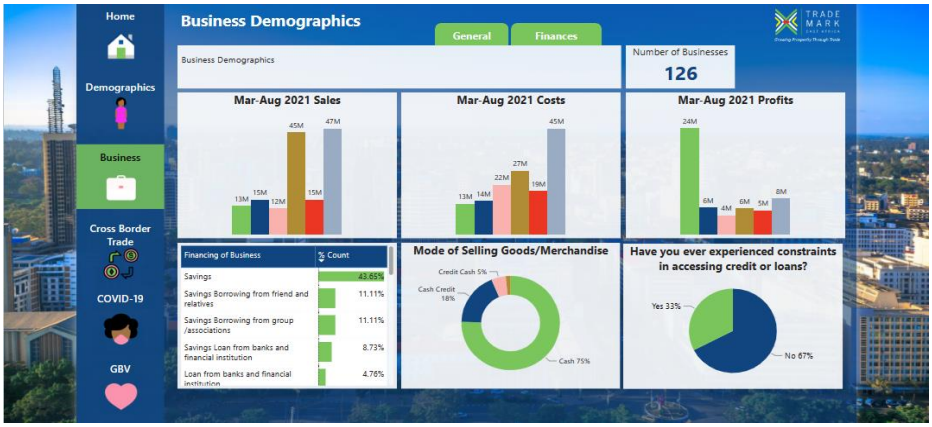
Name	Title	Email
Dr. Joseph Sevilla (PhD)	Director	jsevilla@strathmore.edu
Mr. Emmanuel Kweyu	Deputy Director	ekweyu@strathmore.edu
Ms. Irene Gitangu	Grants and Operations Manager	igitangu@strathmore.edu
Dr. John Olukuru (PhD)	Head of Data Science Research	jolukuru@strathmore.edu
Ms. Imelda A. Mueni	IT Outsourcing Manager	imueni@strathmore.edu
Mrs. Lorna Mutegi-Kamau	Industry Relations Manager	lmutegi@strathmore.edu
Ms. Ludovica Ochieng	@iBizAfrica (Business Incubator) Manager	lochieng@strathmore.edu
Ms. Eunice Maingi	IT Security Centre Manager	emaingi@strathmore.edu
Mr. Michael Gichure	Digital Learning & EduTech Manager	mgichure@strathmore.edu
Ms. Diana Mutua	Public Relations Manager	dmutua@strathmore.edu
Mrs. Joyce Bodo	Bids Manager	jbodo@strathmore.edu

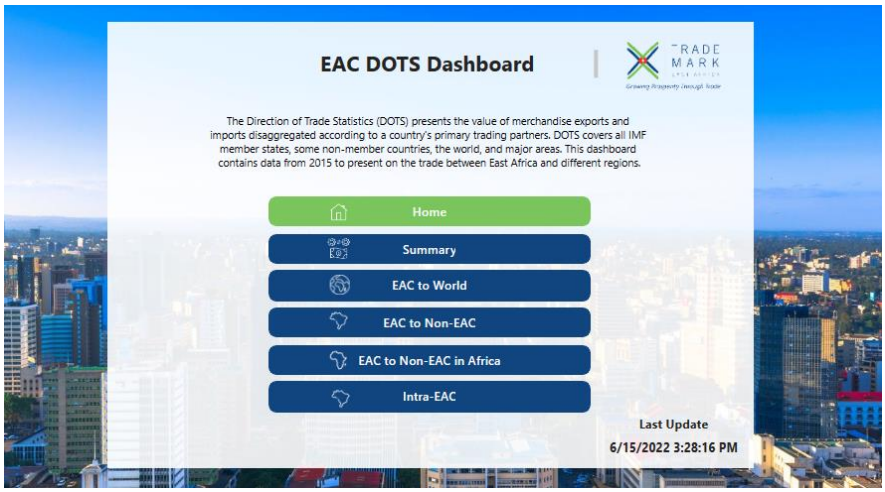
Source: Strathmore University (2023)

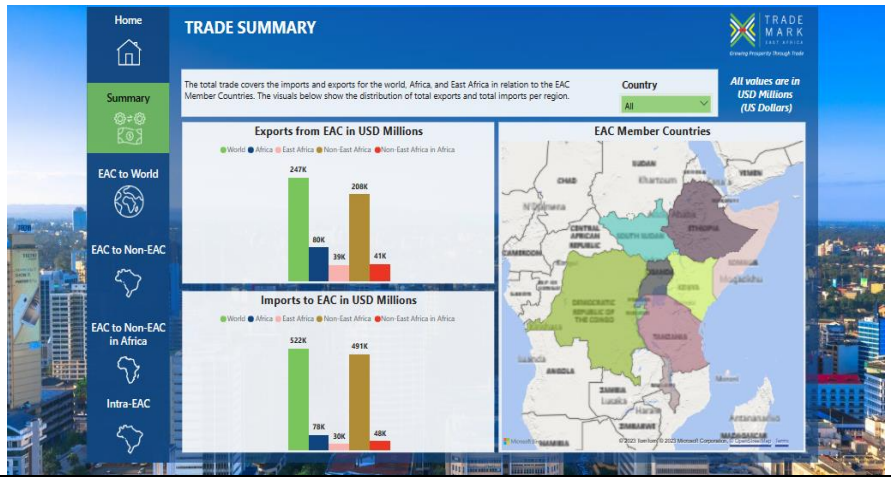
1.2 Consultant's Organizational Experience

As illustrated in the below project list, we have extensive experience in data collection and visualization projects. Notably, we've executed projects for organizations such as TradeMark East Africa, the World Bank, WHO, the Ministry of Health Kenya, and the Kenya National Bureau of Statistics, among others..

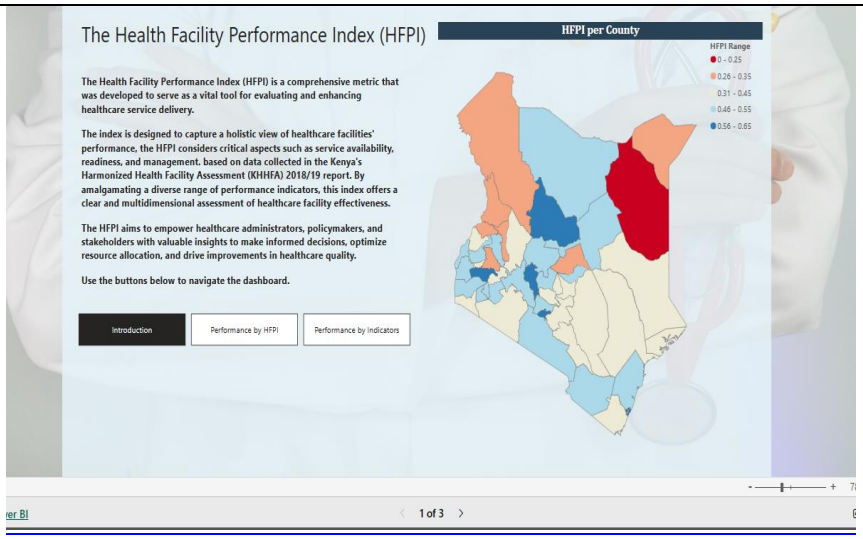
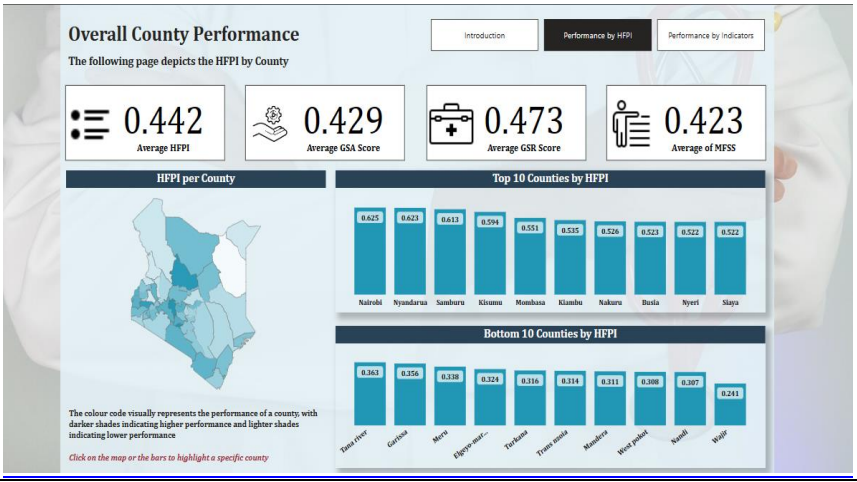
1.	*Name of Project*	*TMEA Research and Learning Data Hub Consultancy*
Name of Client		TradeMark East Africa (TMEA)
Project Description		Develop a research hub for the analysis and visualization of primary and secondary data to inform institutional programming and influence policy direction in the environment in which TMEA operates. @iLabAfrica was involved in Phase 1 of the project in developing dashboards providing data visualization and a platform for data access accessed here: https://research.trademarkafrica.com/data-visualizations/women-in-trade/ Phase 2 of the project is currently ongoing focusing on the use of artificial intelligence and machine learning to mine information from data and produce valuable insights to drive policy-making. 

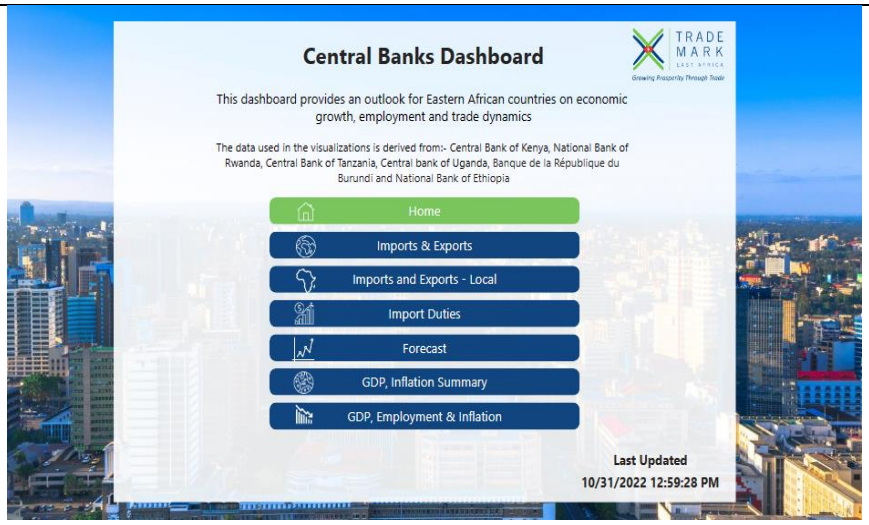
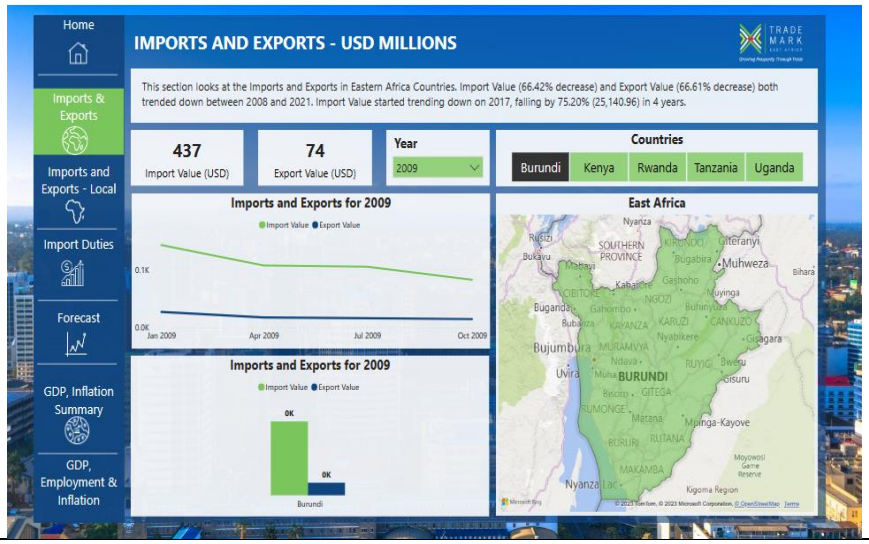
	
Contact Person:	Kevin Rombo - Manager, Research and Learning at TradeMark East Africa
2. ***Name of Project***	***East Africa Trade Statistics Dashboard***
Name of Client	International Monetary Fund
Project Description	This dashboard contains data from the IMF DOTS database which looks at the exports and imports between different countries and regions from 2017 to present. The Direction of Trade Statistics (DOTS) presents the value of merchandise exports and imports disaggregated according to a country's primary trading partners. The 10 East African countries used in this dashboard are: 1. Kenya 2. Uganda 3. Tanzania 4. Rwanda 5. Burundi 6. South Sudan 7. Democratic Republic of Congo 8. Ethiopia 9. Somalia 10. Malawi

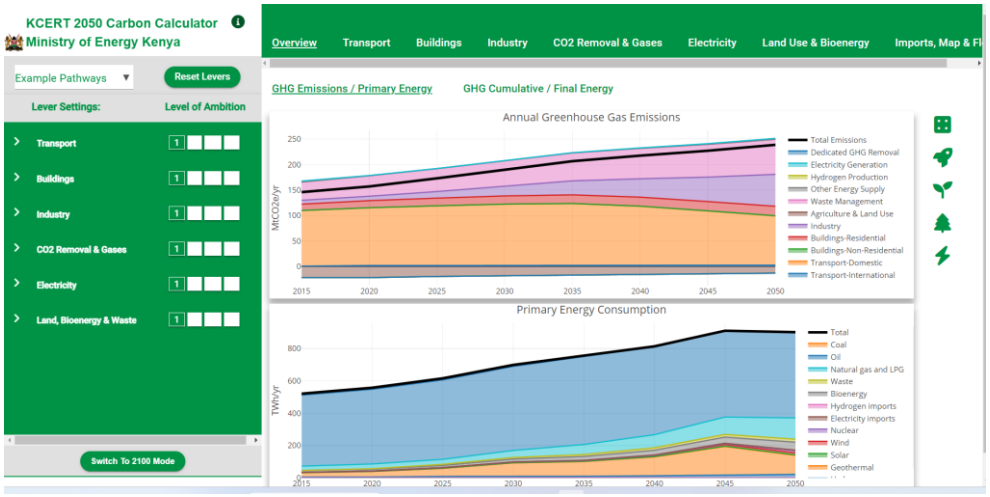




3. *Name of Project*	***KENET - Health Facility Performance Index***
Name of Client	**Kenya Education Network (KENET)**
Project Description	• The Health Facility Performance Index (HFPI) is a composite index structured in three main domains: ○ 'General Service Availability', ○ 'General Service Readiness' and ○ 'Management and Finance Support Systems' • These domains/indicators are based on sub-domains/sub-indicators which are in turn based on 196 indicators, collected for the 47 Kenyan counties for the period of 2018/2019.
Data Source	Kenya's Harmonized Health Facility Assessment (KHHFA) 2018/19 report.

Team Involved	Data Science Team at iLab Africa
Process	Building Composite Index Definition of key indicators based on the HFPI dimensions. Data Visualisation
Final Product	KENET - Health Facility Performance Index (HFPI) -
	 
4. ***Name of Project***	***Central Banks Dashboard***
Client	Trademark East Africa
Project Description	This dashboard provides an outlook for Eastern African countries on economic growth, employment and trade dynamics. It contains data from the different central banks in the EAC Countries • Kenya – Central Bank of Kenya

	• Uganda – Bank of Uganda • Tanzania – Bank of Tanzania • Ethiopia – National Bank of Ethiopia • Burundi - Bank of the Republic of Burundi • Rwanda – National Bank of Rwanda
Data Source	The data used in the visualizations is derived from:- Central Bank of Kenya, National Bank of Rwanda, Central Bank of Tanzania, Central bank of Uganda, Banque de la République du Burundi and National Bank of Ethiopia
Process	Data Preparation Data Modelling Data Visualization (Power BI) Documentation
Final Product	Regional Central Banks Dashboard
	 

5.	*Name of Project*	***Kenya Carbon Emission Reduction Tool Calculator***
Name of Client		Kenya Carbon Emission Reduction Tool Calculator (KCERT)
Project Description		KCERT 2050 is an open-source climate and energy system modeling tool for energy supply and demand scenarios that aims at building a low-carbon society with a long-term perspective towards 2050. Link: https://kcert.ilabafrica.ac.ke/
Duration of Project:		2021-2022
		
6.	*Name of Project*	***Artificial Intelligence for Agriculture and Food Systems***
Name of Client		Artificial Intelligence for Agriculture and Food Systems (AI4FS)
Project Description		Artificial Intelligence for Agriculture and Food Systems: Weather Information dissemination and weather based advisory. Providing localized and actionable climate information services to help smallholder farmers.
Duration of Project:		2022-2023

7.	***Name of Project***	***The Kenya Health and Research Observatory (KHRO)***
Name of Client		World Bank/WHO/Ministry of Health Kenya
Project Description		**Kenya Health and Research Observatory (KHRO)** web portal (https://khro.health.go.ke/#/), is an information technology platform designed to facilitate multi-stakeholder collaboration and partnership in accessing and using information for strengthening national health information systems as well as serving as a repository for the best available information and provide tools to strengthen the monitoring of health sector performance. The KHRO has two distinct but interrelated functions, namely ‘**’Data and Statistics Platform’’** and ‘**’Research Knowledge Translation Platform**.” It plays an instrumental role in monitoring the country’s progress towards UHC.
Approx. Project Cost:		USD: 200,000
Duration of Project:		Phase 1 (May 2019 – Feb 2020); Phase 2 (Oct 2020 – April 2021)
Contact Person:		Mr. Leonard Cosmas, Health Information and M&E Technical Officer, WHO Kenya Country Office Email: cosmasl@who.int
		
8.	***Name of Project***	***Capacity Building in Data Skills for Rural Smallholder Farmers Digital Solutions in Africa***
Name of Client		University Of Bristol

Project Description	The project aimed to integrate the broad expertise in data science at the University of Bristol and the data science team at Strathmore University by developing capacity building and knowledge exchange activities in Bristol and Nairobi, with the objective to drive forward digital solutions to rural societal challenges in Kenya. The consortium carried out training sessions and community engagement around digital solutions for smallholder farmers and developed a prototype tool that identifies, monitors, classifies and predicts weeds and crop diseases, insects, and nematodes using computer vision/machine learning.
Approx. Project Cost:	GBP 16,267
Duration of Project:	May 2020 - July 2021
Contact Person:	Emma Kuwertz - Data Science Specialist Jean Golding Institute Email: emma.kuwertz@bristol.ac.uk
9. Name of Project	***Enhancing Dissemination of Kenya National Bureau of Statistics County –Level Data, Phase1***
Name of Client:	The Kenya National Bureau of Statistics (Kenya) and The World Bank
Project Description:	The project involved data Visualization-based that sought to enhance the Bureau's county data dissemination capabilities through the use of ICT tools. Data source from key publications was visualized and hosted on an online portal, the KNBS County Data Visualization Portal (https://knbs.or.ke/visualizations/).Main components- Backend, Data Analysis, Visualization, Mobile portal app, Bulk Download, Data Search
Approx. Project Cost:	USD: 65,000
Duration of Project:	2014 - 2015
Contact Person	Cleophas Kiio; Director, ICT Email: ckiio@knbs.or.ke; Mobile: +254 722 218 516

10.	***Name of Project:***	***TWIGA***
	Name of Client	European Commission H2020
	Project Description:	**TWIGA (Transforming Weather Water Data into Value-Added Information Services for Sustainable Growth in Africa)** (https://website.twiga-h2020.eu) aimed to provide currently unavailable geo-information on weather, water, and climate for Sub-Saharan Africa. @iLabAfrica was particularly involved in the development of in-situ weather stations and weather-index-based crop insurance, integrated products that combine the information obtained from satellite images, local weather data and crop models.
	Approx. Project Cost:	EUR 4,979,622.50
	Duration of project:	February 2018 – January 2022
	Contact Person:	Marie-Claire ten Veldhuis. - Associate professor at Delft University of Technology Email: J.A.E.tenVeldhuis@tudelft.nl
11.	***Name of Project:***	***Capacity Building in Data Science Skills for Rural Smallholder Farmers Digital Solutions in Africa***
	Name of Client	University of Bristol
	Project Description:	The project aimed to integrate the broad expertise in data science at the University of Bristol and the data science team at Strathmore University by developing capacity building and knowledge exchange activities in Bristol and Nairobi, with the objective to drive forward digital solutions to rural societal challenges in Kenya. The consortium carried out training sessions and community engagement around digital solutions for smallholder farmers and developed a prototype tool that identifies, monitors, classifies and predicts weeds and crop diseases, insects, and nematodes using computer vision/machine learning.
	Approx. Project Cost:	GBP 16,267
	Duration of project:	May 2020 - July 2021
	Contact Person:	Emma Kuwertz - Data Science Specialist Jean Golding Institute Email: emma.kuwertz@bristol.ac.uk
12.	***Name of Project:***	***Wildlife Information & Landscape Database (WILD) Project***
	Name of Client:	USAID Funded:
	Project Description:	WILD is a comprehensive, off-the-shelf data collection and reporting tool designed for organisations engaged in conservation activities in both protected and community areas. The WILD mobile application tracks a unit's movement by taking GPS points and overlaying them on google maps. While on patrol the scouts or rangers can report on incidents such as recording wildlife; poaching; animal mortality; HWC; community service; and others. These incidents are geo-tagged and time and date stamped. The information and photos automatically transfer back to headquarters when the patrol has a telephone signal or stores on their phone until network or Wi-Fi is secured. WILD can also be used to track legal cases arising as a

		result of an organisation's activities. Conservancy managers can customise the data collected by hiding or showing specific information fields in WILD.
	Approx. Project Cost:	USD: 688,750
	Duration of project:	Sep, 2016 - Sep, 2018
	Contact Persons:	Scott McCormick, Chief of Party, +254 786 404 003 scott.mccormick@ea-prepared.org
13.	***Name of Project:***	Enhancing Dissemination of Kenya National Bureau of Statistics County-Level Data, Phase 1
	Name of Client:	The Kenya National Bureau of Statistics (Kenya) and The World Bank
	Project Description:	The project involved data visualisation-based that sought to enhance the Bureau's county data dissemination capabilities through the use of ICT tools. Data source from key publications was visualised and hosted on an online portal, the KNBS County Data Visualisation Portal (https://knbs.or.ke/visualizations/). Main components- Backend, Data Analysis, Visualisation, Mobile portal app, Bulk Download, Data Search
	Approx. Project Cost:	USD: 65,000
	Duration of project:	2014 - 2015
	Contact Person:	Cleophas Kiio; Director, ICT Email: ckiio@knbs.or.ke; Mobile: +254 722 218 516

2.0 MISSION COMPREHENSION, APPROACH, AND METHODOLOGY

2.1 Background to the Consultancy

The African DeepTech Ecosystem Mapping Study arises from an urgent need to understand the ever-evolving landscape of the African technology scene. Africa, as an upcoming hub of technological innovation, offers a unique blend of challenges and opportunities. The consultancy, championed by the @iLabAfrica (Strathmore University's ICT Centre of Excellence), leverages the Center's extensive experience in similar assignments, ensuring an approach that is both methodologically robust and contextually relevant.

2.2 Our Interpretation of the Objectives

The consultancy seeks to provide a comprehensive and in-depth perspective on the present state of the African DeepTech Ecosystem. To achieve this general objective, the consultancy will focus on the following specific objectives:

Specific Objective	Our Interpretation
1. Identify the most advanced sectors and countries in terms of deep tech development in Africa.	**Sectoral and Geographical Leadership in DeepTech:** • Determine which sectors within the deep tech field are the most advanced and cutting-edge. • Ascertain which African countries are leading in terms of deep tech development and innovation.
2. Identify and analyze key components of the deep tech ecosystem, including startups and entrepreneurs, support structures and research centers, universities, investors, and relevant stakeholders, developing a market map that visualizes the deep tech ecosystem.	**Ecosystem Market Map Development:** • Identify and comprehensively analyze the primary components that make up the deep tech ecosystem in Africa. • Create a detailed visual market map that shows the relationships and structures between startups, entrepreneurs, research centers, universities, investors, and other pertinent stakeholders.
3. 3. Analyze the pattern of women involvement in DeepTech innovation and the landscape of female-led deep tech startups.	**Female Participation in DeepTech:** • Investigate the role and prominence of women in deep tech innovation within the continent. • Develop an understanding of the landscape of startups within the deep tech sector that are led by women.
4. Highlight the strengths, challenges, opportunities and best practices in the deep tech sector across the region as well the priorities to unleash the	**Strengths, Challenges, and Opportunities Analysis:** • Recognize and enumerate the strengths that are propelling the deep tech sector forward in the region. • Identify the challenges that are potentially hindering growth and innovation.

potential of that specific ecosystem.	• Pinpoint the opportunities available for growth and further innovation. • Document best practices that have been adopted in the sector, highlighting what works and can be emulated. • Lay out the key priorities that, if addressed, can significantly boost the ecosystem's potential.
5. Analyze the regulatory and policy frameworks supporting the development of deep tech in each target country.	**Policy and Regulatory Framework Analysis:** • Study the policies and regulations that are in place in the target countries, assessing their role in aiding or impeding the development of the deep tech sector. • Provide insights on how supportive each country's regulatory framework is towards the growth and development of deep tech innovations.

2.3 Scope of the Mission

This table provides a structured approach to understanding the various aspects of the mission's scope, detailing the activities that will be undertaken in each scope and the results that stakeholders can expect from these efforts.:

Scope	Details/Activities	Expected Outcomes
Data Collection	1. Develop data collection instruments like surveys, interviews, and questionnaires. 2. Source secondary data from existing research, databases, and reports. 3. Deploy teams or tools to gather primary data across target regions. 4. Validate and clean collected data for analysis.	Comprehensive dataset that captures the current state and dynamics of the African DeepTech Ecosystem.
Stakeholder Identification	1. List potential stakeholders in the DeepTech Ecosystem (e.g., startups, investors, universities). 2. Categorize stakeholders based on their role and influence. 3. Prioritize stakeholders based on their relevance to the study's objectives.	A segmented and prioritized list of stakeholders crucial to the DeepTech Ecosystem.
Trend Analysis	1. Analyze historical data to identify trends over time. 2. Use data visualization tools to better understand data patterns. 3. Compare the African DeepTech trends with global trends to identify gaps and opportunities.	Insights into the evolving nature of the DeepTech sector in Africa, highlighting growth areas and potential stagnations.

Challenges and Opportunities	1. Identify barriers faced by stakeholders within the ecosystem. 2. Highlight systemic challenges impeding growth. 3. Point out areas with untapped potential. 4. Conduct SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis.	A detailed report highlighting the major challenges hindering the DeepTech sector and potential opportunities for growth and innovation.
Geographical Mapping	1. Map the geographical distribution of DeepTech entities across Africa. 2. Identify hubs or concentrations of DeepTech activities. 3. Highlight regions lagging behind in DeepTech innovation. 4. Utilize GIS (Geographical Information Systems) for detailed spatial analysis.	A visual representation of the African continent showing the distribution and concentration of DeepTech activities and potential innovation deserts.

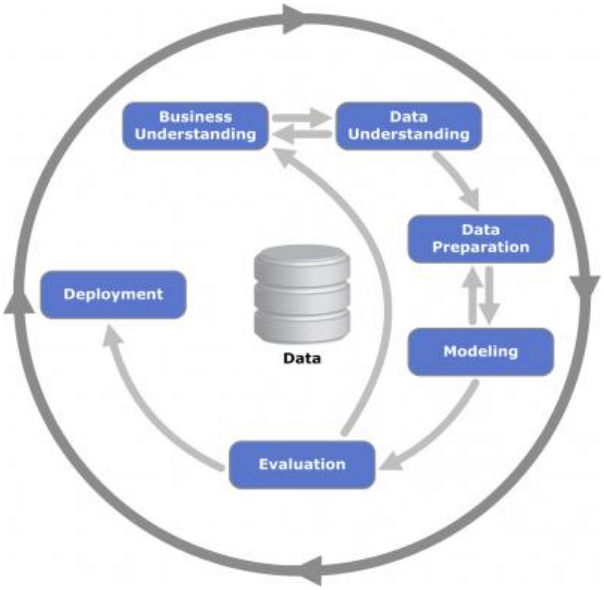
2.3 Methodological Approach

2.3.1 Data Analytics Methodology (CRISP-DM)

The consultant proposes to use the **Cross Industry Standard Process for Data Mining (CRISP-DM)** model. CRISP-DM is a problem-agnostic cross-industry open standard process model used by data analytics experts. The CRISP-DM model is implemented in six major steps:

1. ***Business Understanding:*** Under this step, the analysts focus on understanding the project objectives and requirements.
2. ***Data Understanding:*** Under this step, the experts start with initial data collection, familiarizes with the data, identifies data quality issues as well as detects interesting subsets to inform the hypothesis.
3. ***Data Preparation:*** In this step the analysts construct the final dataset from the initial raw data.
4. ***Modelling:*** In this step, the analysts evaluate, select and apply the appropriate data modelling techniques that meet the business objectives.
5. ***Evaluation:*** This step entails building high quality models based on the selected loss functions. The model should have the ability to deal with new unseen data.
6. ***Deployment:*** This last step involves deploying the data model built in step 5.

The Figure below illustrates the iterative nature of the CRISP-DM model.



The consultant prefers the CRISP-DM model since it provides a structured approach to planning a data analytics project. The model is robust and highly reliable even in rapidly changing business environments where data, business requirements and customer needs are ever changing. The model encourages data analytics experts to focus on business goals. The model also uses an iterative approach which grants clients frequent opportunities to evaluate the progress of the project against its original objectives and make corrective adjustments.

CRISP-DM model can be aligned based on both the specific objectives and the scope of the mission as illustrated in the tables below for better clarity and understanding:

CRISP-DM Mapped by Specific Objectives

Specific Objectives	CRISP-DM Step	Description
1. Identify the most advanced sectors and countries in terms of deep tech development in Africa.	Data Understanding	Initial data collection would focus on gathering relevant metrics and data on sectors and countries in Africa to determine the level of deep tech development.
2. Identify and analyze key components of the deep tech ecosystem.	Data Understanding & Data Preparation	Gather and refine data on startups, entrepreneurs, support structures, research centers, universities, investors, and stakeholders.
3. Analyze the pattern of women involvement in DeepTech innovation.	Data Understanding & Modelling	Gathering gender-specific data within the deep tech sector and using modeling to analyze the patterns of involvement.

4. Highlight the strengths, challenges, opportunities in the deep tech sector.	Modelling & Evaluation	Use data modeling techniques to highlight the current scenario and evaluate the findings.
5. Analyze the regulatory and policy frameworks.	Data Understanding & Data Preparation	Collect data on the existing policy frameworks across target countries and prepare them for detailed analysis.

CRISP-DM Mapped by Scope of the Mission

Scope	CRISP-DM Step	Brief Explanation
Data Collection	Business Understanding & Data Understanding	Define the project objectives and requirements. Start with initial data collection and familiarize with the data sources.
Stakeholder Identification	Data Preparation	Refining data to pinpoint the main stakeholders in the deep tech ecosystem.
Trend Analysis	Modelling & Evaluation	Using models to determine trends in the data and subsequently evaluating those trends for insights.
Challenges and Opportunities	Modelling & Evaluation	Identifying challenges and opportunities within the deep tech ecosystem using relevant models and evaluating them.
Geographical Mapping	Data Understanding & Data Preparation	Gathering data specific to geographical distributions and refining it for a spatial analysis of the deep tech ecosystem.

2.3.2 Data Collection Approach

1. Target Population:

- **Sectors**: Various DeepTech sectors such as AI, Robotics, Biotech, etc.
- **Countries**: Tunisia, Morocco, Senegal, Togo, Benin, Rwanda, Nigeria, Egypt, Kenya, South Africa, Ivory Coast.
- **Startups**: DeepTech startups across the continent.
- **Support Structures**: Tech hubs, incubators, accelerators, and coworking spaces.
- **Research Centers & Universities**: Known for deep tech research and development.
- **Investors**: Venture capitalists, angel investors, and other financial institutions that invest in DeepTech in Africa.
- **Other Stakeholders**: Policymakers, industry experts, etc.

2. Sampling:

Stratified Sampling: Given the diversity in the tech ecosystems of different African countries and sectors, stratified sampling will be used. Here, each country or sector will represent a stratum, and a certain number of startups, support structures, will be selected from each stratum.

3. Sample Size:

Determining an exact sample size would require some statistical considerations, such as the desired confidence level and margin of error. However, for the sake of this example:

- **Sectors**: All major DeepTech sectors.
- **Startups**: 50 from each mentioned country (total 550, considering 11 countries).
- **Support Structures**: 20 from each country (total 220).
- **Research Centers & Universities**: 10 from each country (total 110).
- **Investors**: 15 from each country (total 165).
- **Other Stakeholders**: 20 from each country (total 220).

4. Data Collection Method:

Primary Data Collection:

- **Surveys**: Using KoboToolbox, design detailed questionnaires tailored for each category of the target population.
- **Interviews**: virtual interviews or Face-to-face (where possible) or for detailed insights.
- **Focus Groups**: Gather groups of experts or stakeholders in each country to discuss specific themes.

Secondary Data Collection:

- **Literature review**: Academic articles, industry reports, and white papers on the African DeepTech ecosystem.
- **Online Databases**: Access databases that may have relevant data (e.g., startup databases, investment trends).
- **Government and Regulatory Reports**: For insights on policy frameworks and regulations.

5. Data Validation:

Post-collection, it's essential to validate the data for accuracy and comprehensiveness. This will involve:

- Cross-checking with multiple sources.
- Review sessions with industry experts.
- Feedback loops with stakeholders to verify data points.

2.3.3 Quality Assurance Methodology

To ensure the integrity and reliability of our results:

1. All data analysis processes will undergo regular internal peer reviews.
2. The project will employ stakeholder feedback loops at critical milestones, ensuring our insights remain aligned with on-ground realities.
3. All findings and interpretations will be cross-referenced with primary and secondary sources to ensure accuracy and credibility.

2.3.5 Risk Management Methodology

Given the evolving nature of tech ecosystems, managing uncertainties is paramount:

1. A risk register will be maintained and updated regularly, capturing potential risks.
2. Each risk will be assessed based on its likelihood and potential impact.
3. Customized mitigation strategies will be crafted for high-priority risks, and response plans will be put in place for rapid action.

This table captures some primary risks the consultant anticipates as well as possible mitigation strategies:

Risk	Probability	Impact	Mitigation Strategy
Incomplete or inaccurate data from stakeholders	Medium	High	Develop clear data collection guidelines and verification processes. Engage multiple sources for data triangulation.
Non-cooperation or limited participation from key stakeholders	Medium	High	Ensure continuous engagement, communicate the project's value to stakeholders, and offer incentives if possible.
Data privacy breaches or leaks	Low	Very High	Employ robust cybersecurity measures, access controls, and educate team on data handling protocols.

Rapid changes in the DeepTech ecosystem during the consultancy period	High	Medium	Adopt a flexible and iterative approach. Regularly update data and analysis to capture recent trends.
Cultural and language barriers when engaging stakeholders across Africa	Medium	Medium	Engage local liaisons or interpreters and ensure cultural sensitivity training for the consultancy team.
Potential biases in data analysis and interpretation	Medium	High	Use diverse teams for data analysis and conduct frequent peer reviews. Use established frameworks for unbiased analysis.
Logistical challenges for in-person engagements or visits	Medium	Medium	Have a contingency plan for remote engagements. Prioritize key regions or hubs for visits and use local representatives.
Regulatory and policy unpredictabilities affecting data collection	Low	Medium	Stay updated with local regulations, engage with local legal counsel, and be prepared to adapt data collection strategies.
Technical issues with the technology stack or tools	Low	Medium	Ensure regular maintenance, updates, and have backup solutions in place. Provide training for the team on the tools used.

2.3.4 Data Quality and Privacy Approach

Maintaining data quality and ensuring privacy is paramount, especially in a data-driven project like the African DeepTech Ecosystem consultancy. The consultant's approach to data quality and privacy are as tabulated below:

Component	Description
Data Accuracy	Ensure that the data collected, processed, and analyzed is correct and represents the actual figures, facts, or information. Utilize verification and validation techniques to ascertain data accuracy.
Data Completeness	Ensure that all necessary data points are captured without gaps. Missing data can be addressed through imputation techniques or supplementary data collection.
Data Consistency	Ensure that data remains consistent across all datasets, especially when data is being sourced from multiple stakeholders or systems.
Data Timeliness	Make sure data is current and relevant to the time period of interest. Regular updates might be necessary depending on the dynamic nature of the data source.
Data Uniqueness	Remove duplicate records to ensure each data point is unique, thus preventing over-representation of any data item.
Privacy Regulations Compliance	Ensure adherence to local and international data privacy regulations, such as GDPR, depending on the countries involved in the consultancy.

Data Anonymization	De-identify personal data to protect individual identities. This involves removing, encrypting, or pseudonymizing personal identifiers.
Access Control	Implement robust access controls to ensure only authorized personnel can access sensitive data. Role-based access control can be effective.
Data Retention and Destruction	Determine how long the data should be retained post-analysis and ensure secure disposal of data after its retention period.
Consent Management	Ensure that data is collected with the explicit consent of stakeholders, where necessary. Maintain a clear record of consents received.
Data Breach Protocols	Have a clear process in place for identifying, reporting, and responding to any potential data breaches.

2.3.5 Technology Stack Used

The table below outlines our proposed core technological needs for the assignment, ensuring that each phase of the project is supported by the right tool.:

Component	Technology/Tool	Purpose
Data Collection	KoboToolbox	To conduct surveys, gather primary data, and store it in a structured format. Especially useful for field data collection given its offline capability.
Data Storage	Amazon S3	Secure, scalable, and durable storage solution for collected data and processed datasets.
Data Cleaning	Python (pandas)	To clean, transform, and structure data for analysis.
Data Analysis	Python (pandas, NumPy, scikit-learn)	For statistical analysis, data manipulation, and machine learning.
Data Visualization	Tableau/Power BI	Create interactive and visual dashboards for stakeholders. Provides easy insights and drill-down capabilities.
Geographical Mapping	QGIS or ArcGIS	Geospatial analysis and visualization of data on maps.
Database Management	PostgreSQL (with PostGIS for geospatial data)	Structured storage of processed data and efficient querying capabilities.
Cloud Infrastructure	Amazon Web Services (AWS)	Scalable infrastructure for hosting, computing, and data storage needs.
Collaboration & Version Control	GitHub	Version control for code and collaborative platform for team development.
Documentation	Microsoft Office Suite (Word, Excel) & Google Workspace	For preparing reports, spreadsheets, and presentations.
Communication	Slack or Microsoft Teams	Efficient communication within the team and with stakeholders.

Security & Access Control	AWS Identity and Access Management (IAM)	Define and manage user identities and permissions to ensure secure access to resources.
Backup and Disaster Recovery	AWS Backup	Regular backup of data and configurations, ensuring quick recovery in case of any issues.

2.3.6 Stakeholder Engagement and Collaboration Approach

Preliminary analysis has identified various stakeholders as shown by the Stakeholder Matrix below:

Stakeholder Group	Interest in Project	Influence on Project	Engagement Strategy
DeepTech Startups	High: Need for insights and data-driven decisions to optimize their businesses.	High: Their operations provide the primary data.	Regular consultations and feedback sessions to understand their needs.
Entrepreneurs	High: Gain insights for innovation and business opportunities.	Medium: Key source of innovation but may not have large-scale data.	Surveys and interviews to gather firsthand knowledge and insights.
Research Centers	High: Need data for ongoing research and development.	High: Provide in-depth knowledge and data.	Collaborative workshops and data-sharing agreements.
Universities	Medium: Academic research and potential curriculum input.	Medium: They can offer academic perspective and resources.	Collaboration on research papers and seminars.
Investors	High: Use data to make informed investment decisions.	High: Financial backing and business guidance for startups.	Periodic briefings and reports on findings.
Policy Makers	High: Information to frame supportive policies.	High: They can enable or inhibit ecosystem growth through regulations.	Regular updates and special briefings to guide policy formation.
Women-led Startups	High: Represent the diversity and inclusivity within the ecosystem.	Medium: Their perspective adds depth to the data.	Focus group discussions and dedicated surveys.
General Public/Consumers	Low: General interest in the development of the tech ecosystem.	Low: Their consumption drives the market but have indirect influence.	Public reports and findings dissemination for awareness.

The consultant proposes the following stakeholder engagement and collaboration tools and techniques:

Engagement Approach	Description	Collaboration Tool	Tool Purpose
Informative	Keeping stakeholders informed about project developments, milestones, and issues.	Weekly/Bi-Weekly Emails	To disseminate regular updates, newsletters, or important announcements.
Consultative	Seeking input from stakeholders on specific topics or decisions.	Surveys (e.g., KoboToolbox)	To gather feedback, opinions, or suggestions.
		Focus Groups	Facilitated discussions to gather in-depth insights.
Collaborative	Working together with stakeholders on project aspects or decision-making.	Microsoft Teams, Slack	Real-time communication, meetings, and collaborative decision-making.
		Google Workspace (Docs, Sheets)	Collaborative document editing and sharing.
Feedback Loop	Regularly collecting feedback to refine project outcomes.	Feedback Forms (e.g., Google Forms)	To collect and analyze feedback for continuous improvement.
Workshops & Training	Engaging stakeholders through learning sessions or co-creation.	Virtual Meeting Platforms (e.g., Zoom, WebEx)	Hosting virtual workshops, trainings, or brainstorming sessions.

3.0 WORK PLAN AND IMPLEMENTATION PLAN

3.1 Work Plan

The consultant proposes an approximately 32 weeks work plan. The proposed project activities, expected deliverables, responsible party and project duration are as tabulated below.

Month	Week(s)	Key Activity & Task	Deliverable(s)	Responsible Party
October	1	Project Initiation and Stakeholder Identification	Data Sources & Initial Stakeholder Profiles, Project Scope Document	Project Management Team
October	2	Participation in the DeepTech Pan-African Thought Leadership Roundtable	Networking & Data Gathering	Entire Project Team
October	3-4	Data Collection and Initial Analysis	Preliminary Data Analysis	Data Collection Team
November	1-2	Deep Tech Ecosystem Mapping and Gender Analysis	Ecosystem Map Draft	Data Analysis Team, Visualization Team,
November	3-4	Report Writing, Dashboard Development, and Finalization	Draft & Final Comprehensive Report, Interactive Dashboard	Report Writing Team, Visualization Team

3.2 Implementation Plan

The Gannt below illustrates the consultant's proposed implementation plan.

Table 2: Implementation Gantt Chart

Sr.	Activity/Task	October				November			
		1	2	3	4	1	2	3	4
1.	Project Initiation and Stakeholder Identification								
2.	Participation in the DeepTech Pan-African Thought Leadership Roundtable								
3.	Data Collection and Initial Analysis								
4.	Deep Tech Ecosystem Mapping and Gender Analysis								
5.	Report Writing, Dashboard Development, and Finalization								

4.0 PROJECT TEAM

@iLabAfrica has a dynamic team of over 80 people. The technical team proposed for this project and their level of involvement are as tabulated below.

Name	Proposed Positions	Involvement (Days)
Dr. Joseph Sevilla	Team Leader	20%
Dr John Olukuru	Project Manager	100%
Technical Staff		
Dr Betsy Muriithi	Research Lead	100%
Joseph Gitonga	Lead Data Scientist	100%
Kelvin Bett	Data Analyst	100%
Maria Ogamba	Data Analyst	100%
Alvin Mugwe	Data Analyst	100%

The CVs of the proposed team are attached as **Annex 1**.

7.0 ANNEXURES

Annex 1: Curriculum Vitae (CV)

<table>
<tr><th colspan="4">Name of Expert: Dr Joseph Sevilla (PhD)</th></tr>
<tr><td colspan="2">Candidate information</td><td colspan="2">Position: Project Team Leader</td></tr>
<tr><td colspan="2"></td><td colspan="2">Professional qualifications</td></tr>
<tr><td colspan="2"></td><td colspan="2">● Ph.D. Bioinformatics, TECNUN, University of Navarre, 2005;
● M.Sc. Computer Science, University College London, London University, 1995;
● MSc. Industrial Engineering (Hons.), ESII, Universidad del País Vasco, 1980;</td></tr>
<tr><td colspan="2">Present employment</td><td></td><td></td></tr>
<tr><td colspan="2"></td><td colspan="2">Name of Employer: Strathmore University, @iLabAfrica</td></tr>
<tr><td colspan="2"></td><td>Address of Employer</td><td>P.O. Box 59857-00200, Keri Road, Madaraka Estate</td></tr>
<tr><td colspan="2"></td><td></td><td></td></tr>
<tr><td colspan="2"></td><td>Telephone: 0703034496</td><td>Contact (manager / personnel officer): Prof. Izael da Silva</td></tr>
<tr><td colspan="2"></td><td>Fax: N/A</td><td>Email: joe@strathmore.edu</td></tr>
<tr><td colspan="2"></td><td>Job title of candidate: Director</td><td>Years with present Employer: 11 years</td></tr>
<tr><td colspan="4">Professional Experience</td></tr>
<tr><td>From</td><td>To</td><td colspan="2">Company/Project/ Position/Relevant technical and management experience</td></tr>
<tr><td>Oct 2020 (Phase 2)

May 2019 (Phase 1)</td><td>Apr 2021 (Phase 2)

Feb 2020 (Phase 1)

Ongoing Support</td><td colspan="2">Company/Institution: @iLabAfrica Research Centre
Client: World Bank / WHO/ Ministry of Health of Kenya
Project: Kenya Health and Research Observatory – KHRO Portal.
Position: Team Leader

Technical and Managerial Experience:
Design, development, and post implementation maintenance of KHRO based on active user participation, reviews and analysis employing a variety of quantitative, qualitative, observational and focus group discussion tools and techniques.</td></tr>
<tr><td>Oct 2019</td><td>To Date</td><td colspan="2">Company/Institutions: County Government of Kirinyaga
Position: Team Leader
Project: Online Revenue Collection and Management System Project Implementation for Kirinyaga County Government
Technical and Managerial Experience:
The Supply, Implementation and Commissioning of an online Revenue Collection and Management System Project Implementation for Kirinyaga County Government.</td></tr>
</table>

Sep 2018	Jan 2019 Ongoing Support	**Company/Institution:** @iLabAfrica Research Centre **Client:** County Government of Kisumu **Project:** Automation of E–Revenue Management System. **Position:** Team Leader **Technical and Managerial Experience:** The Supply, Implementation and Commissioning of a Business Intelligence and Analytics System and an Automated Revenue Receipting System. The principal requirements as stated in the RFP including the operations management of the County, workflow automation, SMS/Email gateway integration, all revenue streams as per the County Finance Bill, citizen registration, business intelligence/analytics, third party integration, data migration, and payment solutions including over the counter, POS terminals, and electronic payment solutions for citizens and suppliers.
Feb 2018	Sep 2018 Ongoing Support	**Company/Institution:** @iLabAfrica Research Centre **Client:** County Government of Kilifi **Project:** Supply of a Revenue Collection System. **Position:** Team Leader **Technical and Managerial Experience:** The Supply, Implementation and Commissioning of a Business Intelligence and Analytics System and an Automated Revenue Receipting System. The principal requirements as stated in the RFP including the operations management of the County, workflow automation, SMS/Email gateway integration, all revenue streams as per the County Finance Bill, citizen registration, business intelligence/analytics, third party integration, data migration, and payment solutions including over the counter, POS terminals, and electronic payment solutions for citizens and suppliers.
Nov 2017	Dec 2017 Ongoing Support	**Company/Institution:** @iLabAfrica Research Centre **Client:** Techbiz Limited for County Government of Mombasa **Project:** Supply and Implementation of property Rates Module. **Position:** Team Leader **Technical and Managerial Experience:** The Supply, Implementation and Commissioning of an Automated property Rates Module.
Sep 2015	Apr 2016 Ongoing Support	**Company/Institution:** @iLabAfrica Research Centre **Client:** County Government of Busia **Project:** Automation of Revenue Collection System **Position:** Team Leader **Technical and Managerial Experience:** Automation of Busia County Revenue Collection. The principal requirements as stated in the RFP include the revenue collections and management of the County, SMS/Email gateway integration, all revenue streams as per the County Finance Bill, citizen registration, third party integration, and payment solutions including over the counter, POS terminals, and electronic payment solutions for citizens and suppliers.
Jan 2015	July 2015	**Company/Institution:** @iLabAfrica Research Centre **Client:** County Government of Taita Taveta

	Ongoing Support	**Project:** Asset Management Collection and Management System **Position:** Team Leader **Technical and Managerial Experience:** Supply, Implementation and Commissioning of a Business Intelligence and Analytics System and an Automated Revenue Receipting System. The principal requirements as stated in the RFP including the operations management of the County, workflow automation, SMS/Email gateway integration, all revenue streams as per the County Finance Bill, citizen registration, business intelligence/analytics, third party integration, data migration, and payment solutions including over the counter, POS terminals, and electronic payment solutions for citizens and suppliers.
Nov 2014	May 2015 Ongoing Support	**Company/Institution:** @iLabAfrica Research Centre **Client:** County Government of Kiambu **Project:** Asset Management Collection and Management System **Position:** Team Leader **Technical and Managerial Experience:** Implementation of a holistic e-Governance Integrated System for County Operations Management, Workflow Automation, Document Management, Electronic Citizen Services Delivery, Business Intelligence and Electronic Payment Systems.
Jan 2011	Present	**Director, iLabAfrica Research Centre, Strathmore University** **Technical and Managerial Experience** Founded @iLabAfrica as a Research Institute under the Faculty of Information Technology at Strathmore University. The Institute actively promotes Research, Innovation, Product Development and Entrepreneurship; it also provides incubation facilities to local entrepreneurs and is actively involved in ICT Policy. Currently, @iLabAfrica brings together some 40 full-time researchers and its various activities have a wide reach within the East Africa region. Mobile Technologies, Cybersecurity, ICT in Education and Development, Entrepreneurship Researcher and Business Incubators, Managerial Decision Modelling, Internet Governance, eLearning, Bioinformatics and FOSS (Free and Open-Source Software) applications.
Nov 2008	Present	**Senior Lecturer– Faculty of Information Technology, Strathmore University** **Technical and Managerial Experience** Actively involved in the promotion of mobile application development and personally mentored a number of promising young local entrepreneurs. Taught a variety of courses while in Strathmore related to ICT and Management such as Web Technologies, IT Network Security and Cryptography, Operations Research and Managerial Decision Analysis as well as directed many research projects both at undergraduate and postgraduate level. Involved in FOSS education since the mid 90‘s and actively promoted the use of FOSS applications in institutions of Higher Learning.

		Appointed External Examiner for Undergraduate Courses at the Faculty of Informatics of the University of Nairobi and served as External Moderator for MSc Projects at Kenyatta University and Jomo Kenyatta University. Actively involved in the promotion of mobile application development and personally mentored a number of promising young local entrepreneurs
Jan 2008	Nov 2008	Dean – Faculty of Information Technology, Strathmore University
May 2007	Nov 2008	Executive Director, Strathmore Research and Consultancy Services
Jan 2006	Dec 2007	Deputy Vice-Chancellor – Research & Quality Assurance Member of the Governing Council, Management Board and Academic Council, Strathmore University
May 2005	Dec 2005	Senior Lecturer Post-Graduate Program Coordinator IT Steering Committee – Chairman, Strathmore University
July 1997	Oct 2002	Director—Information Technology Centre, Strathmore University
Oct 1995	Oct 2002	Project Manager IT, Strathmore University
Oct 1995	Feb 1997	IMIS GDS Course Director, Strathmore University
Jan 1991	Sep 1995	Director—Information Technology Centre. Lecturer in Computer Programming, Strathmore University
Dec 1983	Oct 2002	Member of the Management Board., Strathmore University
June 1983	Dec 1990	Registrar and Lecturer in Operations Research and Computer Programming, Strathmore University
Oct 1980	June 1983	Assistant Lecturer/Research Assistant Escuela Superior de Ingenieros Industriales Universidad del País Vasco. Bilbao., Strathmore University

Name of Expert: Dr John Olukuru (PhD)	
Proposed Position	Project Manager
Education/ qualifications	*PhD Actuarial Science - Quantitative Finance* The University of Glasgow, Adam Smith Business school September 2009 – *September 2012* *MSc Actuarial Science, Graduated with Distinction* Heriot-Watt University, Edinburgh September 2008 – June 2009 *MSc Statistics* University of Nairobi 2005 – 2007 *BED (Science), First class (Hon)* Egerton University 1998 – 2003
Professional Certifications	Affiliate member of the Institute of Actuaries, the actuarial profession, UK Faculty of Actuary Students Association – member
Employment Record	2021-Present Team member, FCDO sponsored project on ODPC Kenya, Strategy Plan development.

	2021-Present	Team Lead, excel modelling team on UK government-sponsored Kenyan Carbon Emission Reduction tool
	2021-Present	Team lead, IDRC sponsored project on modelling extreme weather in Kenya
	2020-Present	Team Member, Afrilabs project on curriculum development for start-ups in Africa.
	2019-Present	Board Member, Young Scientist Kenya – initiative for youth in East Africa to showcase their innovation skills.
	2016-Present	Head of Data Science and Analytics, Strathmore University
	2016-Present	Director, Risk Management Centre
	2015-Present	Board Member, Valuraha Limited company. Board chaired by Eddy Njoroge

Name of Expert: Joseph Theuri			
Proposed Position		Lead Data Scientist	
Professional qualifications			
		Institution: Georgia Institute of Technology Year: August 2020 to Present Course: Master of Science in Analytics Institution: Strathmore University Year: June 2014 to December 2017 Course: Bachelor of Business Science in Finance	
Present employment		Name of Employer: Strathmore University, @iLabAfrica,	
		Job title of candidate: Data Scientist	Years with present Employer: 4 years
Professional Experience			
From	To	Company/Project/ Position/Relevant technical and management experience	

Jan 2021	To Date	Company/Institution: Dalberg Data Insights Position: Data Scientist Technical and Managerial Experience: I identify and create data solutions around international development challenges. Through collaboration and rigorous data analysis, I am involved in designing products and solutions for social good. Key Contributions: ● Analysed COVID-19 statistics and created dashboards for Government to aid in tracking and reporting key information. ● Lead the front-end development of Health Dashboards to help in tracking vaccination and immunization across African countries. ● Developed a Knowledge Management System that utilized Network Analysis to enhance knowledge sharing.

Oct 2020	To Date	Company/Institution: iLabAfrica Position: Lead Data Scientist Technical and Managerial Experience: Leading the Technical team, I took part in developing 3 key strategic pillars for the Data Science Function at iLabAfrica: Consulting, Research and Teaching. Key Contributions: Consulting: ● Customer Feedback Analysis: Developed an automated system that analyses customer feedback and generates a report based on both close-ended questions and open-ended questions. This reduced time-to-reporting by 80%. ● Predictive Modelling: Developed Machine Learning models that could predict loan default and customer churn. The potential cost-saving after implementation was valued at USD 1.2M Research: Working closely with donor organizations my work entails leading a team of research analysts to deliver on set research objectives. Some of the research work done includes: ● Crop Insurance Index: Developed a rainfall-based and soil moisture insurance index in collaboration with industry partners that would potentially reduce losses for farmers by USD 10M. ● Flood Maps for Disaster Planning: Developed an early warning flooding detection system for the Town of Narok that would potentially save property damage worth USD 1M. Training: ● I train and assist industry professionals to implement practical Data Science projects aimed at solving real-life business challenges. Some of these projects included: Intelligent Parameter Optimization: Algorithmic optimization of voice & data traffic to ensure optimal service during pick hours saving the company USD 6M.

		• Intelligent SMS Self Service using deep learning: Automated Customer Service ChatBot that caters to customer requests that had a potential cost saving of USD 4M. • Big Data Analytics in Energy: Monitoring and Evaluation of Energy used to ensure adherence to SDGs lead to cost savings of USD 2M.

Jan 2018	Sep 2020	Company/Institution: Strathmore University Position: Data Analyst Technical and Managerial Experience: As the Manager of the Institutional Data Analytics Unit, I was responsible for developing and implementing comprehensive tools and strategies that allow raw data to be transformed into business insights to inform strategy. Key Contributions ● Enhanced data collection structures and procedures that allowed for a more fluid flow of information and improved average client satisfaction from 20% to 95% by having more timely, accurate and accessible information. ● Developed an Automated Monitoring System which allowed for better debt collection and billing practices and resulted in unlocked revenue of over 25% of annual revenue (USD 5M). ● Worked with various stakeholders across the university to establish better data management practices resulting in improved data governance and a reduction in data submission delays by 30%

Name of Expert: Dr Betsy Muriithi (PhD)			
Candidate information		Position: Research Fellow	
Professional qualifications			
		Institution: Warwick Business School Year: October 2015 to June 2021 Course: Doctor of Philosophy in IT Institution: Kent Business School Year: October 2014 to September 2015 Course: M.Sc. Business Analytics, Graduated with Distinction	
Present employment		Name of Employer: Strathmore University, @iLabAfrica,	
		Job title of candidate: Research Fellow	Years with present Employer: 0.1 years
Professional Experience			
From	To	Company/Project/ Position/Relevant technical and management experience	

Dec 2020	June 2021	Company/Institution: Dalton Consultancy Client: Kenya Medical Practitioners and Dentist Council Project: Technical Assistance to the Counties of COVID-19 and Health System Strengthening of the UHC System Position: Data Analyst Technical and Managerial Experience: Developed a framework for wider sharing to guide COVID-19 management in the country and inform policy direction based on analysis of data collected by the Technical Assistance to the Counties on COVID-19 preparedness.
Oct 2015	Sept 2020	Company/Institution: Warwick Business School Client: Shrewsbury and Telford Hospital Trust Project: Modelling Hospital Older Emergency Care Patient Pathways to Inform Targeted Community Interventions Position: Junior Researcher Technical and Managerial Experience: Designed and implemented a methodological framework for analysing longitudinal patterns of use resulting in an objective taxonomy of older frequent emergency department users for health care operational planning. Collated and critically analysed large amounts of information to define problem causes or gaps and determine available options to design appropriate solutions resulting in funding awards for research and obtaining access to the HES database granted through NHS Digital.

Jun 2019	Dec 2019	Company/Institution: OR Society Client: Kissing it Better Project: Creating a data collection and monitoring system Position: Consultant Technical and Managerial Experience: Developed a quantitative dashboard based on Google Sheets that provided evidence of the value of service delivery of a therapy service run by the Kissing it better charity at Warwickshire Hospital trust.
Jun 2015	Sep 2015	Company/Institution: University of Kent Client: Medway Child OT Service Project: Automation of Client Therapy Evaluation and Satisfaction Position: Business Analyst Technical and Managerial Experience: The placement saw the development of an excel data entry system using VBA to automate data entry and analysis of client therapy evaluation and satisfaction. Developed an excel dashboard containing annual and semi-annual reports on service metrics and client satisfaction ratings.

<table>
<tr><th colspan="4">Name of Expert: Maria Ogamba</th></tr>
<tr><td colspan="2">Candidate information</td><td colspan="2">Position: Data Analyst</td></tr>
<tr><td colspan="2"></td><td colspan="2">Institution: Strathmore Univeristy
Year: June 2017 to June 2021
Course: Bachelor of Science: Informatics and Computer Science</td></tr>
<tr><td colspan="2">Present employment</td><td colspan="2">Name of Employer: Strathmore University, @iLabAfrica,</td></tr>
<tr><td colspan="2"></td><td>Address of Employer</td><td>P.O. Box 59857-00200. Keri Road, Madaraka Estate</td></tr>
<tr><td colspan="2"></td><td>Telephone: +254703034496</td><td>Contact (manager / personnel officer): Imelda A. Mueni</td></tr>
<tr><td colspan="2"></td><td>Fax: N/A</td><td>Email: jgitonga@strathmore.edu</td></tr>
<tr><td colspan="2"></td><td>Job title of candidate: Data Scientist</td><td>Years with present Employer: 4 years</td></tr>
<tr><td colspan="4">Professional Experience</td></tr>
<tr><td>From</td><td>To</td><td colspan="2">Company/Project/ Position/Relevant technical and management experience</td></tr>
<tr><td>Nov 2021</td><td>To Date</td><td colspan="2">Company/Institution: @iLabAfrica Strathmore University
Position: Business Intelligence Analyst
- Gather business requirements, client needs and use data to come up with plans that meet and exceed the requirements of the client's needs.
- Acquire data from primary or secondary data sources, filter, and clean data, maintain databases/data systems while ensuring data quality, identifying, analyzing, and interpreting trends or patterns in complex data sets.
- Model, design and implement statistical/predictive models and cutting-edge algorithms utilizing diverse sources of data to predict using R, Python, and SPSS.
- Draw inference and present observations in various formats like web presentation, PowerPoint-based on client requirements.
- Achieve results through follow-up of projects through to completion, monitoring project progress, managing priorities, committing to achieving quality outcomes, adhering to documentation procedures, and seeking feedback from stakeholders to gauge satisfaction.
- Liaise and work effectively with the software development team to ensure all data needs are well addressed in projects.</td></tr>
</table>

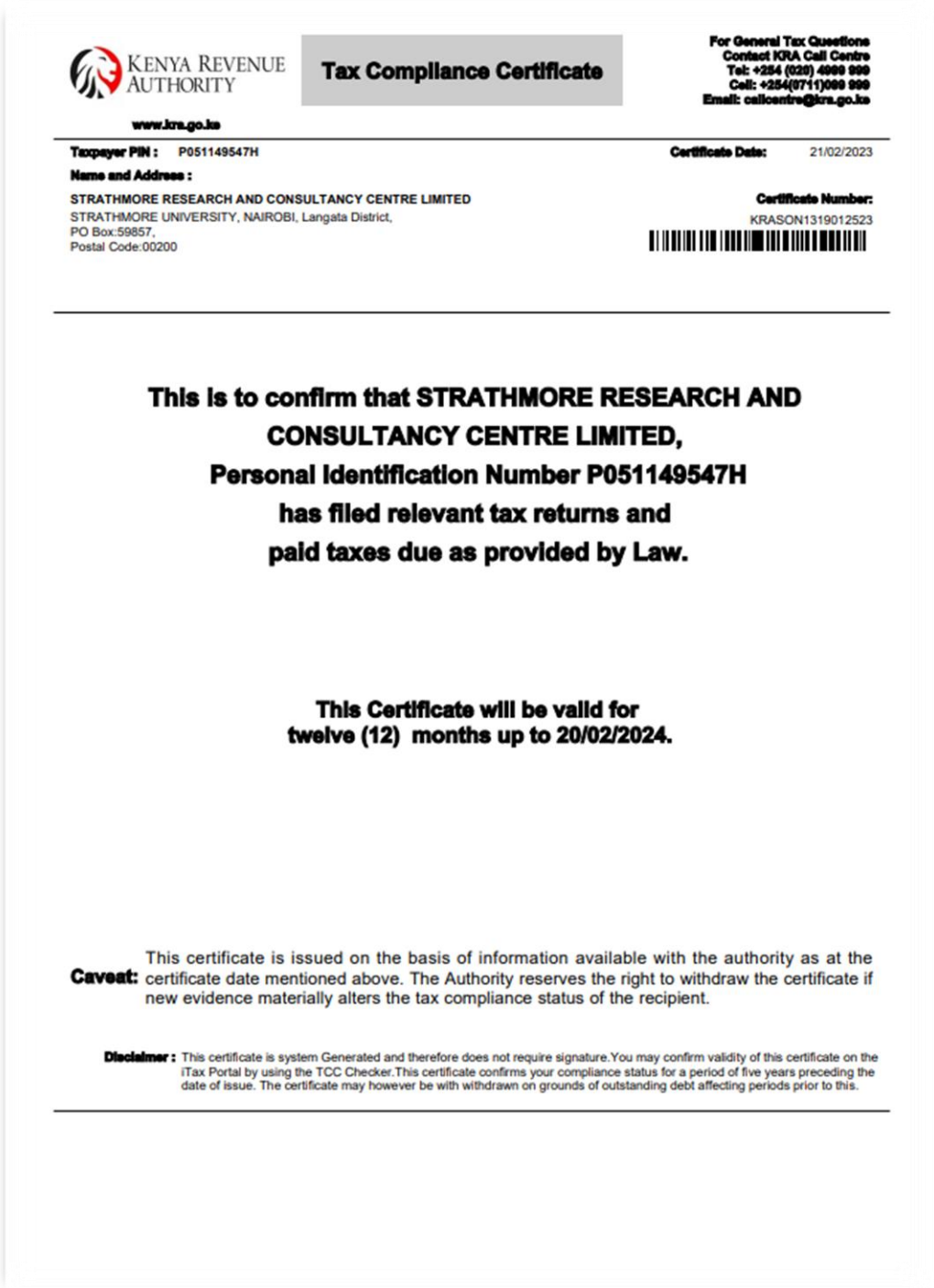
		- Research on new and emerging trends in data science so as to grow skills and hence facilitate client projects is a necessity. - Provide assistance in administrative tasks such as project management.
Jun 2021	Oct 2021	Company/Institution: @iLabAfrica Strathmore University Position: Student Assistant: · Assisting the team in creating and editing surveys used for data collection. · Cleaning and analyzing data using Power BI and Python · Visualizing data using Python and JavaScript · Writing research papers for various projects · Providing assistance on administrative tasks

Name of Expert: Kelvin Bett			
Candidate information		Position: Data Analyst	
Professional Qualifications		Institution: Strathmore University	
Present employment			
		Name of Employer: Strathmore University, @iLabAfrica,	
		Address of Employer	P.O. Box 59857-00200. Keri Road,
		Telephone:	Contact (manager / personnel
		Fax: N/A	Email: jgitonga@strathmore.edu
		Job title of candidate:	Years with present Employer:
Professional Experience			
From	To	Company/Project/ Position/Relevant technical and management	
Nov 2019	To Date	Company/Institution: @iLabAfrica Strathmore University	
Dec 2018	To Date	Company/Institution: Strathmore Africa Data Analytics Center	
Publications			
"*Using data analytics to scale crop insurance for small scale farmers*," Strathmore			

Name of Expert: Alvin Igwoba			
Candidate information		Position: Data Analyst	
		Institution: Strathmore University Year: April 2021 to Present	
Present employment		Name of Employer: Strathmore University, @iLabAfrica,	
		Address of Employer	P.O. Box 59857-00200. Keri Road, Madaraka Estate
		Telephone: +254703034496	Contact (manager / personnel officer): Imelda A. Mueni
		Fax: N/A	Email: aigobwa@strathmore.edu
		Job title of candidate: Data Scientist	Years with present Employer: 2 years
Professional Experience			
From	To	Company/Project/ Position/Relevant technical and management experience	
Aug 2021	To Date	Led a project on adverse climate modelling that would help in the awareness of food security in Kenya through the analysis of regional	
Jan 2020	Aug 2021	Company/Institution: @iLabAfrica Strathmore University Position: Junior Data Scientist	

Annex 2: Statutory Documents

1. Valid Tax Compliance Certificate



KENYA REVENUE AUTHORITY

Tax Compliance Certificate

For General Tax Questions
Contact KRA Call Centre
Tel: +254 (020) 4999 999
Cell: +254(0711)099 999
Email: callcentre@kra.go.ke

www.kra.go.ke

Taxpayer PIN : P051149547H

Certificate Date: 21/02/2023

Name and Address :

STRATHMORE RESEARCH AND CONSULTANCY CENTRE LIMITED
STRATHMORE UNIVERSITY, NAIROBI, Langata District,
PO Box:59857,
Postal Code:00200

Certificate Number:
KRASON1319012523

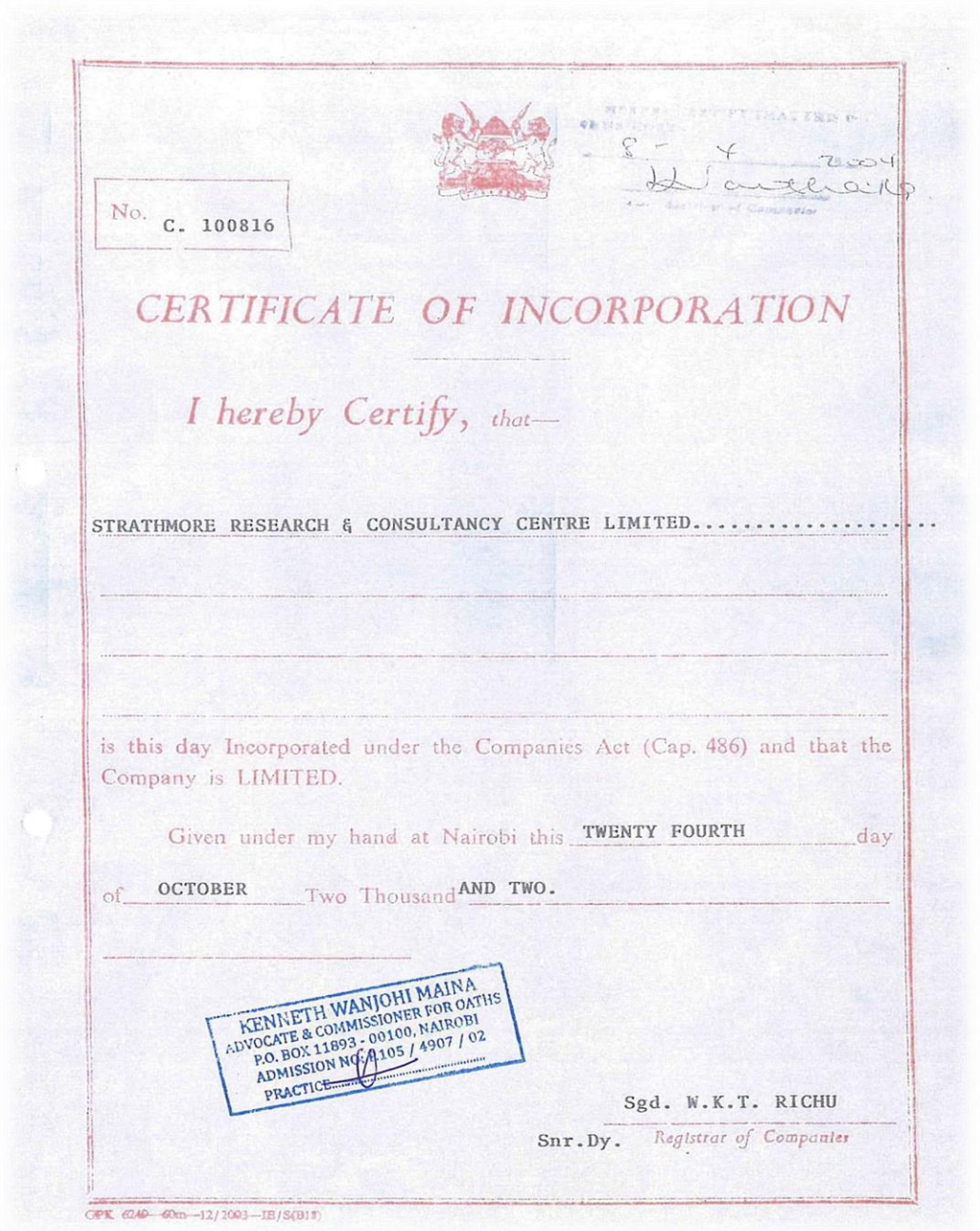
This is to confirm that STRATHMORE RESEARCH AND CONSULTANCY CENTRE LIMITED, Personal Identification Number P051149547H has filed relevant tax returns and paid taxes due as provided by Law.

This Certificate will be valid for twelve (12) months up to 20/02/2024.

Caveat: This certificate is issued on the basis of information available with the authority as at the certificate date mentioned above. The Authority reserves the right to withdraw the certificate if new evidence materially alters the tax compliance status of the recipient.

Disclaimer : This certificate is system Generated and therefore does not require signature.You may confirm validity of this certificate on the iTax Portal by using the TCC Checker.This certificate confirms your compliance status for a period of five years preceding the date of issue. The certificate may however be with withdrawn on grounds of outstanding debt affecting periods prior to this.

2. Certificate of Incorporation



No. C. 100816

CERTIFICATE OF INCORPORATION

I hereby Certify, that—

STRATHMORE RESEARCH & CONSULTANCY CENTRE LIMITED.....

is this day Incorporated under the Companies Act (Cap. 486) and that the Company is LIMITED.

Given under my hand at Nairobi this TWENTY FOURTH day of OCTOBER Two Thousand AND TWO.

KENNETH WANJOHI MAINA
ADVOCATE & COMMISSIONER FOR OATHS
P.O. BOX 11893 - 00100, NAIROBI
ADMISSION NO. 1105 / 4907 / 02
PRACTICE

Sgd. W.K.T. RICHU
Snr.Dy. Registrar of Companies

3. Certified Pin Certificate

KENYA REVENUE AUTHORITY

www.kra.go.ke

PIN Certificate

For General Tax Questions
Contact KRA Call Centre
Tel: +254 (020) 4999 999
Cell: +254(0711)099 999
Email: callcentre@kra.go.ke

Certificate Date : 05/11/2013

Personal Identification Number

P051149547H

This is to certify that taxpayer shown herein has been registered with Kenya Revenue Authority

Taxpayer Information

Taxpayer Name	Strathmore Research And Consultancy Centre Limited
Email Address	pkiptanui@strathmore.edu

Registered Address

L.R. Number :	**Building :** STRATHMORE UNIVERSITY
Street/Road : MADARAKA	**City/Town :** NAIROBI
County : Nairobi	**District :** Nairobi West District
Tax Area : Nairobi West	**Station :** South of Nairobi
P. O. Box : 59857	**Postal Code :** 00200

Tax Obligation(s) Registration Details

Sr. No.	Tax Obligation(s)	Effective From Date	Effective Till Date	Status
1	Income Tax - Company	01/04/2003	N.A.	Active
2	Income Tax - PAYE	12/04/2007	N.A.	Active
3	Value Added Tax (VAT)	07/09/2005	N.A.	Active

The above PIN must appear on all your tax invoices and correspondences with Kenya Revenue Authority. Your accounting end month is December unless a change has been approved by the Commissioner-Domestic Taxes Department. The status of Tax Obligation(s) with 'Dormant' status will automatically change to 'Active' on date mentioned in "Effective Till Date" or any transaction done during the period. This certificate shall remain in force till further updated.

KENNETH WANJOHI MAINA
ADVOCATE & COMMISSIONER FOR OATHS
P.O. BOX 11893 - 00100, NAIROBI
ADMISSION NO: P.105 / 4907 / 02
PRACTICE.....

Disclaimer : This is a system generated certificate and does not require signature.

4. Vat Registration Certificate

VAT 2

Kenya Revenue Authority

VALUE ADDED TAX DEPARTMENT

Effective Date of Registration (EDR)	VAT Registration Number	PIN
08/08/2005	0149495Z	P051149547H

VAT - Certificate of Registration

Issued to: STRATHMORE RESEARCH & CONSULTANCY CENTRE LTD
Postal Address: P.O. BOX 59857 , 00200 NAIROBI
Physical Address: Road/Street: OLE SANGALE, NAIROBI
Building/Plot No.: LR NO 209/10774
Date of Issue: 08/08/2005

J.M. ORIORO

For: COMMISSIONER OF VALUE ADDED TAX

KENNETH WANJOHI MAINA
ADVOCATE & COMMISSIONER FOR OATHS
P.O. BOX 11893 - 00100, NAIROBI
ADMISSION NO. P.105 / 4907 / 02
PRACTICE.....

5. Single Business Permit

NAIROBI CITY COUNTY

SINGLE BUSINESS PERMIT

Effective Date: 5th January 2023 Expiry Date: 4th January 2024 Duration: 12 Months

Nairobi City County grant this Business Permit to

Applicant / Business / Commercial Name: STRATHMORE RESEARCH AND CONSULTANCY CENT RE LIMITED - N/A

Permit ID: SBP-99EA06EB KRA Pin: P051149547H

To engage in the activity/business or occupation of Technical and Financial Services

Activity Code: 615-Small professional services firm with over 1 - 20 employees/pro-fessionals. Technical guards e.t.c. &-Corporate Training and Consul-tancy

Having Paid a business Permit Fee of KES: 35,000

Amount in words ***Thirty Five Thousand Shillings Only***

Business under this permit shall be conducted at the address as indicated below

Sub County Langata Ward Nairobi West

P.O Box: - Plot No: 20/10744

Road Street: OLE SANGALE ROAD

Building: Strathmore University Floor: 2ND Door / Stall No: N/A

Date of Issue 5th January 2023 By order of

Powered By KENYA REVENUE AUTHORITY

Notice: It is an offence to give false information. Granting this permit does not exempt the business identified above from complying and any other relevant laws and regulations as established by the Government of kenya and Nairobi City County

6. Disclosure of Beneficial Ownership (CR12)

THE REPUBLIC OF KENYA

BUSINESS REGISTRATION SERVICE
P. O. BOX 30031
NAIROBI
2 AUG 2021

To
JAMES NYIHA WANJOHI
P.O. Box 28491
00200 - CITY SQUARE

THE COMPANIES ACT, 2015

Records relating to the below company held by the Companies Registry as at **2 Aug 2021**

COMPANY	STRATHMORE RESEARCH AND CONSULTANCY CENTRE LIMITED
COMPANY NUMBER	C.100816
NOMINAL SHARE CAPITAL	100,000.00
NUMBER AND TYPE OF SHARES (VALUE PER SHARE)	ORDINARY: 1000 (KES 100.00 EACH)
DATE OF REGISTRATION	24TH OCT, 2002
REGISTERED OFFICE	P.O BOX 59857-00200 TELEPHONE: , EMAIL: COUNTY: , DISTRICT: , LOCALITY: STREET: , BUILDING:
POSTAL ADDRESS	P.O BOX 59857-00200
ENCUMBRANCES	

Name of Directors and Shareholders of the above company with their particular are as follows

NAME	DESCRIPTION	ADDRESS	NATIONALITY	SHARES
ANTHONY KAHINDI MUTUNE	DIRECTOR	P.O BOX 59857 CITY SQUARE	KENYA	
PAUL KIOKO MBITHI	DIRECTOR	P.O BOX 58056 CITY SQUARE	KENYA	
GEORGE NGETHE NJENGA	DIRECTOR	P.O BOX 59857 CITY SQUARE	KENYA	
STRATHMORE UNIVERSITY	SHAREHOLDER		KENYA	ORDINARY: 1000
CHARLES NJIRU KANJAMA	DIRECTOR	P.O BOX 528 G.P.O NAIROBI	KENYA	
PRATAP KUMAR	DIRECTOR	P.O BOX 357-00606 NAIROBI	INDIA	
DA SILVA IZAEL PEREIRA	DIRECTOR	P.O BOX 59857-00200 NAIROBI	UGANDA	
JAMES NYIHA WANJOHI	SECRETARY	P.O BOX 28491 CITY SQUARE	KENYA	
ANN PATRICIA GATHIRU KAMIRI	DIRECTOR	P.O BOX 2394 KENYATTA N.HOSPITAL	KENYA	
			TOTAL	1000

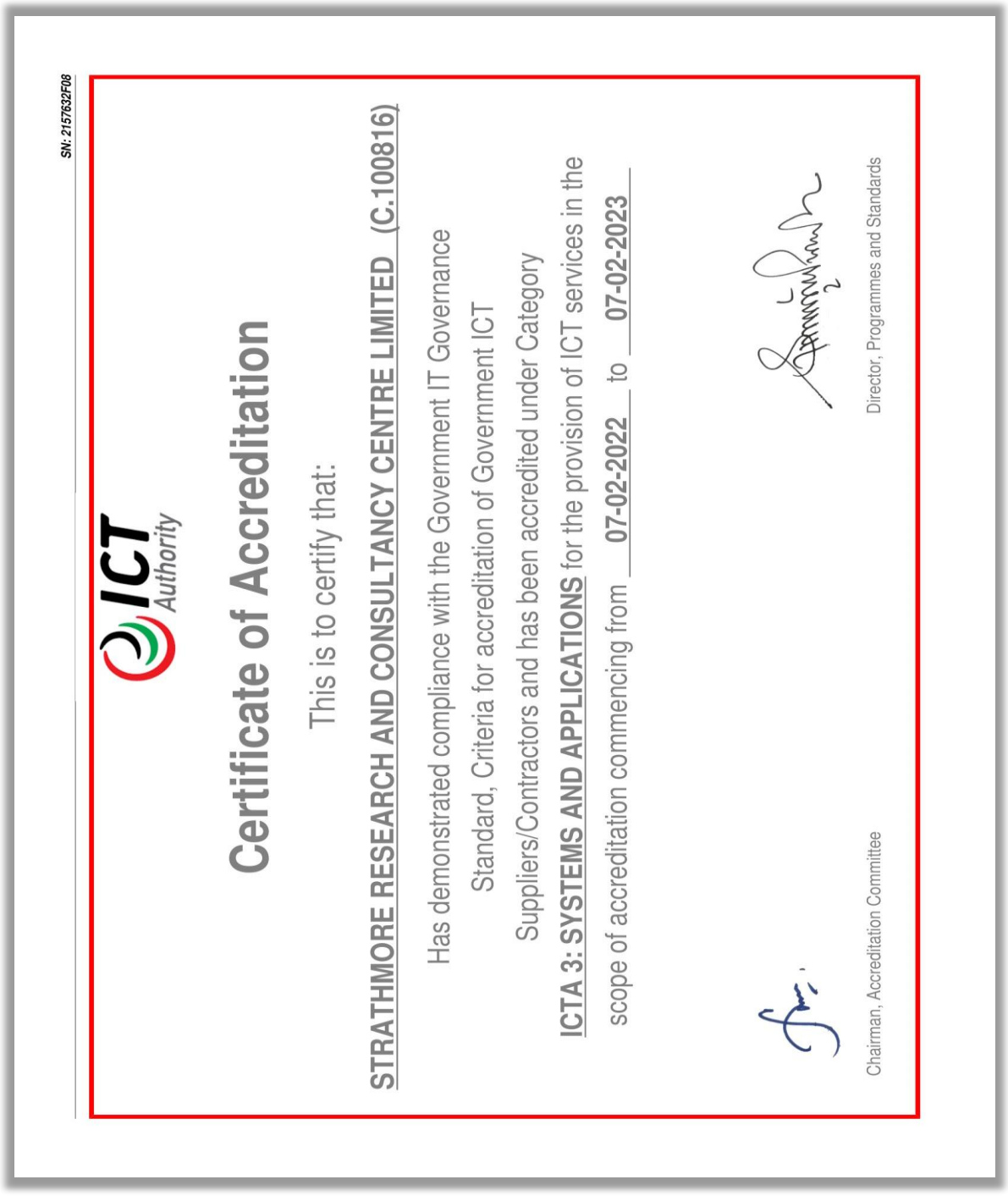
Yours Faithfully,
REGISTRAR OF COMPANIES

REF NO: OS-3DF7BYGZ

KENNETH WANJOHI MAINA
ADVOCATE & COMMISSIONER FOR OATHS
P.O. BOX 11893 - 00100, NAIROBI
ADMISSION NO. 1105 / 4907 / 02
PRACTICE.....

DISCLAIMER: THIS IS A SYSTEM GENERATED CERTIFICATE AND DOES NOT REQUIRE A SIGNATURE

7. ICT Authority Kenya – Certificate of Accreditation



SN: 2157632F08

ICT Authority

Certificate of Accreditation

This is to certify that:

STRATHMORE RESEARCH AND CONSULTANCY CENTRE LIMITED (C.100816)

Has demonstrated compliance with the Government IT Governance Standard, Criteria for accreditation of Government ICT Suppliers/Contractors and has been accredited under Category **ICTA 3: SYSTEMS AND APPLICATIONS** for the provision of ICT services in the scope of accreditation commencing from **07-02-2022** to **07-02-2023**

Chairman, Accreditation Committee

Director, Programmes and Standards

8. Communications Authority of Kenya – Telecommunications Licence

REPUBLIC OF KENYA

COMPLIANCE CERTIFICATE

This is to certify that

STRATHMORE RESEARCH & CONSULTANCY CENTRE LIMITED

of Post Office Box 59857 Nairobi 00200

has been licensed as a

TELECOMMUNICATIONS CONTRACTOR

in the Republic of Kenya in accordance with the Kenya Information & Communications Act, the Kenya Information & Communications Regulations and the Terms & Conditions of the referenced license.

This certificate is valid up to .....30TH JUNE 2022.....after which it MUST be renewed

Signed .....

For: Director General

Date (day/month/year) 25th/OCTOBER/2021

Serial No: 07-001263-00-00-00243

Please note that this is not a licencebut proof of compliance

KENNETH WANJOHI MAINA
ADVOCATE & COMMISSIONER FOR OATHS
P.O. BOX 11893 - 00100, NAIROBI
ADMISSION NO: P.105 / 4907 / 02
PRACTICE

Annex 3: Recommendation Letters

World Health Organization

OFFICE OF THE WHO REPRESENTATIVE FOR KENYA
BUREAU DU REPRESENTANT DE L'OMS POUR LE KENYA
Tel: +254-20-7620300 | +254-20-5120300 | +254-722-509403

In reply please refer: **KEN-HSS-002/2022**
Perière de rappeler la reference:

28 February, 2022

TO WHOM IT MAY CONCERN

RE: RECOMMENDATION LETTER FOR STRATHMORE UNIVERSITY RESEARCH CONSULTANCY

This is to confirm that Strathmore University Research Consultancy Centre Limited was engaged by WHO Kenya in October 2020 for three months to support the technical development of the Kenya Health and Research Observatory (KHRO), working in collaboration with the Ministry of Health. Strathmore University Research Consultancy Centre Ltd successfully designed, developed and operationalized the Kenya Health and Research Observatory which is available and hosted at https://khro.health.go.ke. The KHRO is a portal developed to strengthen and improve the availability and utilization of evidence and statistics generated from the national health information systems.

We have found their services satisfactory, consistent and professional; therefore would recommend them for the provision of similar services.

Yours Sincerely,

Dr. Juliet Nabyonga
Ag. WHO Country Representative/Kenya

Encs.

P.O. Box 45335-00100, Nairobi, E-mail: afkenwr@who.int

KENYA NATIONAL BUREAU OF STATISTICS

KNBS
KENYA NATIONAL BUREAU OF STATISTICS
Keeping you informed

P. O. Box 30266
00100,Nairobi GPO, Kenya
Telephone: Nairobi 3317586/8, 612/22, 3317623, 3317651
Fax: 254-020-3315977
Email: directorgeneral@knbs.or.ke
info@knbs.or.ke
Website: www.knbs.or.ke

Reference No. KNBS ADM 29/1

21st May, 2018

TO WHOM IT MAY CONCERN

REF: RECOMMENDATION LETTER

This is to confirm that **Strathmore** was appointed to implement the KNBS County Data Visualization Project.

We confirm we have had a good working relationship with them and their services have been satisfactory.

We wish to recommend them to any organization that would require their services.

Yours Sincerely

Cleophas Kiio
For DIRECTOR GENERAL

Kenya National Bureau of Statistics is **ISO 9001:2015 Certified**