

AFRICAN INNOVATION
INVESTING IN PROSPERITY

“Moreover, given the instrumental role African women play in transforming Africa, it is thrilling to see more women among

the 10 nominees with game changing innovations. By providing platforms to recognise innovation excellence in Africa and mobilising for African innovators, we continue to live up to our credo of engaging, inspiring and transforming. The inspiring stories of these nominees remind us that innovation and African-led solutions are indeed the answer to Africa's growth and prosperity," said Walter Fust, AIF chairman of the board.

Now celebrating its sixth year under the theme *African Innovation: Investing in Prosperity*, IPA is the premier innovation initiative in the African continent, offering a grand share-prize of US\$185 000 and incentives to spur growth and prosperity in Africa through home-grown solutions.

IPA has seen tremendous growth in applications and increasing interest from both innovators and innovation enablers over the years. To date, IPA has attracted more than 7,500 innovators from 52 African countries, making it a truly Pan African initiative. IPA 2017 edition witnessed a record number of entries from over 2,530 innovators across 48 African countries. The foundation has supported past winners and nominees with approximately US\$ 1 million to move their innovations forward. Due to exposure generated by IPA, past winners have gone on to secure over US\$30 million in investments to grow and scale their businesses.

"Over the years, IPA has stimulated impactful and market-oriented innovations aiming at changing lives and transforming Africa. In this sixth edition, we want to promote more investment in home-grown innovations as well as intra-African collaboration and trade to allow the scaling up of viable innovations across borders.

We're excited for the opportunity to work with our partners to ensure the innovations of the 10 nominees will be available to African markets and beyond. We invite you to join us and unlock the potential of African innovators, starting by investing in these 10 nominees," said Pauline Mujawamariya Koelbl, IPA director.

AIF will host the IPA 2017 awards ceremony and its second Innovation Ecosystems Connector on 17-18 July 2017, in Accra, Ghana. The event will focus on how innovation enablers and businesses can leverage funding streams, investments and resources that are critical to unlock potential of African innovators.

Participants at the IPA Awards will get an opportunity to attend the official opening of IPA 2017, experience the innovation marketplace, join high-level roundtable discussions, Zua Hub meet-ups, and networking activities, ending with a celebration of African ingenuity when the IPA 2017 winners will be announced.

The shortlisted top 10 IPA nominees and a summary of their innovations, include:

Innovations in communications and smart solutions

1. Peris Bosire, Kenya: FarmDrive

FarmDrive is a financial technology company that has developed a mobile phone based application that collects data and provides an alternative risk assessment model for small holder farmers. While the continent remains largely dependent on agriculture, one of the biggest challenges facing smallholder farmers is access to credit or finance. Most financial institutions are reluctant to grant credit to farmers because their risk assessment models flag small farmers as being very risky. FarmDrive has developed a new methodology for assessing credit worthiness of farmers that has led to higher acceptance rate of loan applications by farmers while maintaining a very low default rate. This could have the effect of significantly boosting agricultural production on the continent while helping financial institutions cost effectively increase their agricultural loan portfolios.

2. Nokwethu Khojane, South Africa: Lakheni, Turning Social Capital into Buying Power

Lakheni is a social and business model innovation which seeks to aggregate low-income households into buying-groups in order to negotiate favourable discounts for goods and services supplied to these households. Most poor people end up paying for goods and services at a unit price that is usually much higher than the unit price paid by other people with more disposable income. This is because as goods and services are packaged into smaller and smaller units to make them

affordable, they become less economically efficient and end up costing higher than if one was to buy in bulk or in larger units. In essence, the poor end up paying a poverty premium. Lakheni solves this problem by aggregating poor households into a buyer's market by leveraging mobile technology.

3. Omolabake Adenle, Nigeria: Voice Recognition and Speech Synthesis Software for African Languages

This is a software solution that can understand and digitise spoken African languages, and synthesise speech from African languages presented as digitised text. Digitizing African languages in this way allows Africans to interact with hardware devices such as mobile phones, and digital services such as call-centre applications by speaking their local language. The software can be integrated into a wide range of devices and third-party software applications. While voice recognition and speech synthesis software have been developed for various Western and Asian languages, there has been very limited commercial application or academic research for African languages. The difficulty lies in modelling tonality present in most African languages and limited data resources for language modelling. This innovation opens up opportunities for Africans with low literacy levels to also enjoy the benefits of the digital revolution.

4. Nzola Swasisa, Democratic Republic of Congo: Lokole

Lokole, is a device that enables access to efficient email communication anywhere with cellular coverage at a price that is one hundred to one thousand times cheaper than accessing email via regular cellular bandwidth costs. Lokole achieves this firstly by creating a shareable local area network where up to a hundred users within a 25 meters' radius can access the network and share the costs. Secondly, it contains advanced algorithms that compress email and also schedules uploads and downloads of data to when data bundles costs are at their cheapest. Costs per user could be as little as \$0.01/person/day. More than 71% of the African population doesn't have access to efficient communications. Lokole solves this communication problem and enables many communities to access efficient communication for the first time. Applications of Lokole include: health (remote-doctor), education (remote-teacher), commerce (purchase orders via email), business (attachment documents) and many more.

Leveraging artificial intelligence and mechanical solutions

5. Badr Idriss, Morocco: Atlan Space

Atlan Space develops software technology that is then deployed to manage the operations of unmanned aerial vehicles (UAVs) or drones. The software is currently tested for use in managing operations in detecting illegal or harmful maritime activity such as illegal fishing or oil spills over wide expanse areas. UAVs operated by this software can be launched and deployed into monitoring operations without having an aircraft operator. Also, by using Artificial Intelligence they are able to collect data, analyse and produce actionable reports. African governments face numerous challenges in monitoring activities and operation over wide areas. This includes border patrols, deforestation, animal poaching and maritime activity. The software allows for the deployment of UAVs at a very cost effective price without need for highly skilled human intervention and over a wide number of uses.

6. Aly El-Shafei, Egypt: Smart Electro-Mechanical Actuator Journal Integrated Bearing "SEMAJIB"

The patented innovation (SEMAJIB) presented by Dr El-Shafei, is a smart bearing which is versatile and can change its characteristics as it operates. It consists of a magnetic bearing imbedded in an oil-filled journal bearing, thus forming the smart controllable bearing. The flooding of the bearing with oil is a game changer as the purpose of bearings has traditionally been to expel oil. There is a significant improvement in turbine performance using the SEMAJIB particularly in single line combined cycle plants, as well as conventional generator technology. The device is designed to be used to support energy generating turbines and can be used to improve efficiency and reduce costs of generating energy in Africa.

7. Dougbeh-Chris Nyan, Liberia: New Technology for Rapid Detection of Many Infections Using Only One Test

This is a rapid diagnostic test that can detect and simultaneously differentiate at least three to seven infections at the same time within 10 to 40 minutes. In most African countries, there is a lack of sophisticated diagnostic devices and limited expertise in high-tech diagnostics. This hinders the clinical decision-making ability of healthcare providers. This test provides a solution to this clinical problem. The innovation is easy to use in any setting and particularly in rural areas. Additionally, the device is able to detect and distinguish multiple infections which bear the same symptoms for instance, when a patient has yellow fever, malaria, and Ebola. Whereas most testing methods take 3 – 7 days, this device gives test results in 10 – 40 minutes. This would provide a significant step in the detection and management of infectious diseases on the continent.

8. Olanisun Olufemi Adewole, Nigeria: Sweat TB Test, A non-invasive rapid skin test to detect Tuberculosis

Sweat TB Test, is a non-invasive rapid diagnostic test to detect tuberculosis (TB). TB is second only to HIV/AIDS as a leading cause of death in Africa. Available methods are high tech; cannot be deployed in rural centres, dependent only sputum which sometimes may not be collectible and considered messy by patients. It is also time consuming with patients making repeated clinic visits before a diagnosis is made. Delay in diagnosis and missed diagnosis of 3million TB cases occur leading to continuous spread of the disease. Sweat TB Test leverages on TB specific marker in sweat of patients, to produce a point-of-care test to detect TB, within ten minutes, without any needle prick. In simple steps, reports are read and patients commenced on medication as needed at the same clinic visit. It has the potential to contribute towards effectively controlling TB, reduce TB related deaths and holds promise to prevent drug resistance TB in Africa.

9. Gift Gana, Zimbabwe: Dr CADx

Dr CADx is a software solution that helps doctors and health care workers diagnose medical images more accurately. Due to the scarcity of radiologists on the continent, most medical images are read by general doctors or other health care workers who lack expertise and end up misdiagnosing more than 30% of the cases that they review. As a result, millions of patients fail to get the right treatment or the treatment is delayed leading to more complications and even death. Dr CADx uses deep learning to interpret medical images and achieve an accuracy of 82% an improvement over the 70% average for radiologists. Dr CADx is designed to work in low resource settings with poor internet connectivity opening it up for use in many rural settings in Africa.

10. Philippa Ngaju Makobore, Uganda: Electronically Controlled Gravity Feed Infusion Set (ECGF)

The Electronically Controlled Gravity Feed Infusion Set (ECGF) is medical device designed to accurately administer intravenous (IV) fluids and drugs by controlling the rate of fluid flow based on feedback from a drop sensor. Over 10% of children admitted to East African hospitals need immediate infusion therapy. Findings from the FEAST trial indicates that over-infusion in children increased the absolute risk of death by 3.3 % at 48 hours. Erroneous delivery rates can result into serious adverse effects. The ECGF solves this problem as it is very easy to operate and has key safety features which include alarms for rate of infusion (rapid or slow), total volume (over or under) and faulty sensors. A battery utilising a hybrid (AC mains and solar) charging bed powers the device. The ECGF has the potential to save lives by providing accuracy and safety at 8% the cost of a brand-new infusion pump.