

Ugandan wins 4th Africa Prize for Engineering Innovation

A low-cost, reusable malaria testing device that clips onto a patient's finger; a cheap and sustainable recycling method to recover PGMs; a mini science lab; and an intelligent electricity metering system all made the finals of the prestigious 2018 Africa Prize for Engineering Innovation, which was eventually won by Brian Gitta from Uganda.

Ugandan software engineer, Brian Gitta, only 24-years-old, won the Africa Prize for Engineering Innovation. Brian Gitta is the first Ugandan to win the prestigious Africa Prize, and the youngest winner to date. Gitta won UK £25 000 (± R446 000) at the awards ceremony held in Nairobi, Kenya, on 13 June 2018.

Four finalists pitched their innovations to a panel of Africa Prize judges and a live audience, which voted for the most promising engineering innovation. Runners-up were awarded £10 000 each (± R178 400).

Gitta and his team developed Matibabu, a device which tests for malaria without drawing blood. Gitta and his team decided to develop the device after missing lectures several times due to malaria. Matibabu, which means 'medical centre' in Swahili, is a low-cost, reusable device that clips onto a patient's finger, requiring no specialist expertise to operate.

A red beam of light shone through the user's finger detects changes in the shape, colour and concentration of red blood cells, all of which are affected by malaria. The results are available within one minute on a mobile phone that is linked to the device.

Matibabu is currently undergoing testing in partnership with a national hospital in Uganda, and is sourcing suppliers for the sensitive magnetic and laser components required to scale up production.

Matibabu is aimed at individuals, health centres and diagnostic suppliers. The team also aims to set up the device on the streets to allow people to do a single test at a time.

Through their participation in the Africa Prize, the Matibabu team have been approached by international researchers offering support and are currently writing up their ground-breaking findings into an academic paper, to be published within the next few months.

"We are very proud of this year's winner. It's a perfect example of how engineering can unlock development – in this case by improving healthcare," said Rebecca Enonchong, Africa Prize judge. "Matibabu is simply a game-changer."

Gitta commented: "We are incredibly

honoured to win the Africa Prize – it's such a big achievement for us, because it means that we can better manage production in order to scale clinical trials and prove ourselves to regulators. The recognition will help us open up partnership opportunities – which is what we need most at the moment."

Three joint runners up

Collins Saguru, a Zimbabwean working in South Africa was one of three runners up. A chemical engineer, Saguru developed AltMet, a process that recovers the precious metals found in the autocatalytic converters of all petrol and diesel vehicles. The common car part reduces the toxicity of vehicle gas emissions and the converter itself contains Platinum Group Metals (PGMs), ie, platinum, palladium and rhodium. These are all valuable and useful for industrial processes and on the European Union's Critical Materials List, making a strong case for recycling them.

Existing recycling methods require high temperatures, and consequently, a lot of energy. Saguru dismantles used autocatalytic converters, crushes and leaches them before extracting the PGMs, using much lower temperatures than current recycling methods. This means the process is more affordable and emits fewer toxic gases. The chemical reagents used by AltMet are cheap, relatively common and environmentally friendly. Saguru is in negotiations with local partners to set up a comprehensive pilot project.

Ifediora Ugochukwu from Nigeria was the second runner up for iMeter, an intelligent metering system that gives Nigerian users transparency and control over their electricity supply. More than 30% of meters in Nigeria are tampered with or bypassed, and as a result, power utilities resort to bill estimation. The iMeter and AMI system gives consumers transparency and ensures they are billed only for the energy they use. iMeter measures energy usage and connects to cell phones or computers equipped with AMI software so that consumers can manage their energy supply remotely. The system notifies power

utilities of tampering, which discourages vandalism, improves power supply and reduces deaths from electrocution.

The iMeter and Advanced Metering Infrastructure (AMI) software is already set for rollout in two Nigerian municipalities, with private and public partnerships in place.

Michael Asante-Afrifa, from Ghana won the remaining £10 000 runner up prize for Science Set, a mini science lab that contains specially developed materials for experiments. Science Set is the size of a textbook and fits easily into a school bag and on a school desk. Science Set contains 45 different parts, ranging from circuit boards and wires to an electromagnet and mini lightbox. With these, students can perform 26 experiments that are already part of Ghana's primary and junior high school syllabus. The kit is affordable, easy to use, quick to set up and designed to integrate seamlessly into the classroom. Asante-Afrifa's team can produce 1 000 units a month and they have already sold more than 4 000 sets in Ghana.



Brian Gitta, winner of the 4th Africa Prize for Engineering Innovation, developed Matibabu, a device that tests for malaria without drawing blood. Photo: RAEng, James Oatway



Runner up, Collins Saguru, developed AltMet, a process that recovers the precious metals found in the autocatalytic converters of petrol and diesel vehicles. Photo: RAEng, James Oatway



The shortlisted candidates of the 2018 Africa Prize for Engineering Innovation.

The other 12 candidates on the shortlist were:

- Alvin Kabwama from Uganda with UriSAF Maternal and Sexual Reproductive Health Care Kit, which tests urine quickly, accurately and affordably.
- Arthur Woniala from Uganda with Khainza Energy Gas, a cheap biogas made from manure that is safe for household use.
- Brian Mwitwa Mwenda from Kenya with The Sixth Sense, a handheld echo-location device with ultrasonic sensors that alert visually impaired users to objects nearby.
- Daniel Taylor from Ghana with HWESOMAME, a low-cost smart sensor that accurately detects soil conditions and notifies farmers via text or phone call.
- Emeka Nwachimere from Nigeria with Kitovu, an online platform that helps farmers in remote locations to increase crop yields and sell their produce.
- Esther Gacicio from Kenya with eLearning Solutions, an interactive online programme that hosts courses for individuals or serves as a tool for training institutions.
- Lawrence Okettayot from Uganda with Sparky Dryer, a low-tech dehydrator that dries fruit and vegetables to extend their shelf life and reduce food wastage.
- Monicah Mumbi Wambugu from Kenya with Loanbee, a mobile phone application that calculates the user's credit scores and grants micro-loans.
- Nges Njungle from Cameroon with Muzikol, an online music marketing and social media app designed to meet the career needs of musicians.
- Nnaemeka Chidiebere Ikegwuono from Nigeria with ColdHubs, a solar-powered walk-in cold room that extends the life of perishable food by tenfold.
- Peter Kariuki from Rwanda with SafeMotos, an app that connects commuters to the safest motorcycle drivers in Kigali, Rwanda.
- Shalton Mphodisa Mothwa from South Africa with AEON Power Bag, which allows users to charge their phones on-the-go by converting radio waves and solar energy into power.

"All of our finalists have found novel ways to address critical challenges in their home countries – in fact, problems that are faced all over the world," said Africa Prize judge, Rebecca Enonchong. "We're proud to be part of the development of world-class African technologies, and to support emerging African entrepreneurs." □

COMPATIBILITY IE4 TOTAL COST OF PAYBACK CALCULATION OWNERSHIP ELECTRIC SMALL WORKS MOTORS MINI-ELECTRICAL SUBSTATIONS CONSTRUCTION TRAINING SABS IP66 MOTOR TRANSMISSION AND DIESEL DISTRIBUTION GENERATORS ENERGY CONTROL CENTRES TRANSFORMERS LEARNERSHIPS STARTER ENCLOSURES PANELS ZEST ISO 9001 SOFTWARE ENERGY STARTERS LOW VOLTAGE SWITCHGEAR W22 WEG TRANSFORMERS AFRICA MOTOR & DRIVE COMBINATIONS EXTENDED GUARANTEES GENERATOR BBBEE CABLE & LEVEL RACKING COOLING TOWER IP55 VSD MOTOR & CONTROL INSTRUMENTATION TURNKEY SOLUTIONS PROJECTS DISTRIBUTION 24 HR TECHNICAL SUPPORT SUBSTATIONS PAD MOUNT MOTOR FLAMEPROOF MOTORS ELECTRIC MOTORS PERMANENT MAGNET CFW 501 MINING CUSTOM ENGINEERED SUBSTATION SOLUTIONS ENERGY EFFICIENCY DESIGN IE3 SERVICE VARIABLE SPEED DRIVES SPEED CONTROLS SHAW CONTROL W11 ALUMINIUM MOTORS WEG WISE® CONSTRUCTION 24 HR TECHNICAL STOCK HOLDING WEG TRANSFORMERS AFRICA INSULATION SYSTEMS 24 SUPPORT AUTOMATION ENI ELECTRICAL

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