AVAILABILITY AND AFFORDABILITY

The price of the sanitization booths varies between Shs 5m to Shs 10m depending on model and size. Mulindwa says a payment plan can be arranged on a need basis and that one can even hire the booths for a public event through Wuza Limited or Silk Health.

The booths also come with a one year warranty on the entire disinfectant tunnel, free monthly inspection visits, service and repairs commencing upon installation and commissioning.

Mulindwa, however, says the biggest cost of maintaining this booth is the disinfectant but is dependent on how many people are accessing the area where it has been installed.

LOOKING FORWARD

Though the booths have been made to help in the fight against Covid-19, Mulindwa says they will remain relevant in society even when the pandemic has been written off because they not only safeguard against the coronavirus but also other viruses.

"Even if a vaccine is found, it will still take some time for a third world country to give it out to everybody throughout the country; so, that means there will still be people infecting others on a daily basis therefore there will still be need to continue practicing the preventive measures in place which include the full body sanitization especially in public places," Mulindwa says.

So far, Wuza has made 100 booths and more than half of these have already been rolled out to the public.

Mulindwa adds that plans are underway to export these booths in the region. "We have already got an order to export to Kenya," he adds.

It remains to be seen whether the public will warm up to this new technology but there is no denying that it has raised the bar in the fight against Covid-19.

MAKERERE UNIVERSITY UNVEILS THREE NEW COVID-19-RELATED INNOVATIONS

JOHN MUSINGUZI

Makerere University researchers have unveiled three innovations in the line of managing Covid-19, hardly a month after unveiling another one.

Noble Banadda, a professor of bio systems engineering and the principal investigator, unveiled the thermal imaging detector of Covid-19; the biodegradable face masks made using 3D printing; and the wide range of use of 3D printing technology in Covid-19 control in public spaces, in the teaching of science, technology, engineering and mathematics and in planning of urban centres.

At the invitation-only function held at the Main hall on August 28, 2020, were representatives of Petroleum Authority of Uganda, Ministry of Health, Operation Wealth Creation, Kiira Motors Corporation, Ministry of Agriculture, Animal Industry and Fisheries, Resilient Africa Network, Uganda Police Force, African Union, Ministry of Water and Environment, the private sector, Uganda Revenue Authority and National Agricultural Advisory Services.

Earlier on August 7, 2020, Makerere University unveiled a green low-cost touchless hand wash technology for public shared spaces. This innovation, spearheaded by Dr Joshua Wanyama of the college of Agricultural and Environmental Sciences as the principal investigator, ensures an automated delivery of soap and water and a wash that lasts the 20 seconds recommended by World Health Organisation. The machine instructs the user in two languages: English and Luganda. This kit limits contact with surfaces, which would have led to contamination with the coronavirus. Already, 15 kits have been placed at different public shared spaces such as hospitals and markets in Greater Kampala, and doing wonders.

THERMAL IMAGING DETECTION

The thermal imaging detection system is a camera on a stand, a computer and a screen which shows an image of the person whose temperature is being measured and the person's average temperature around the throat, nose, eyes and forehead. Banadda explained that the system has many advantages over the common temperature gun. For example, the person stands a full metre away from the camera and doesn't have contact with the human manning the system. Secondly, while the gun gives temperature of the local area pointed at, most often the forehead, the thermal imaging detection system combines four local temperatures and gives an average. Thirdly, since the Covid-19 cough is different from other coughs, the system is being upgraded to capture the special Covid-19 cough. Fourthly, the system records the minimum and the maximum temperature of a human being.

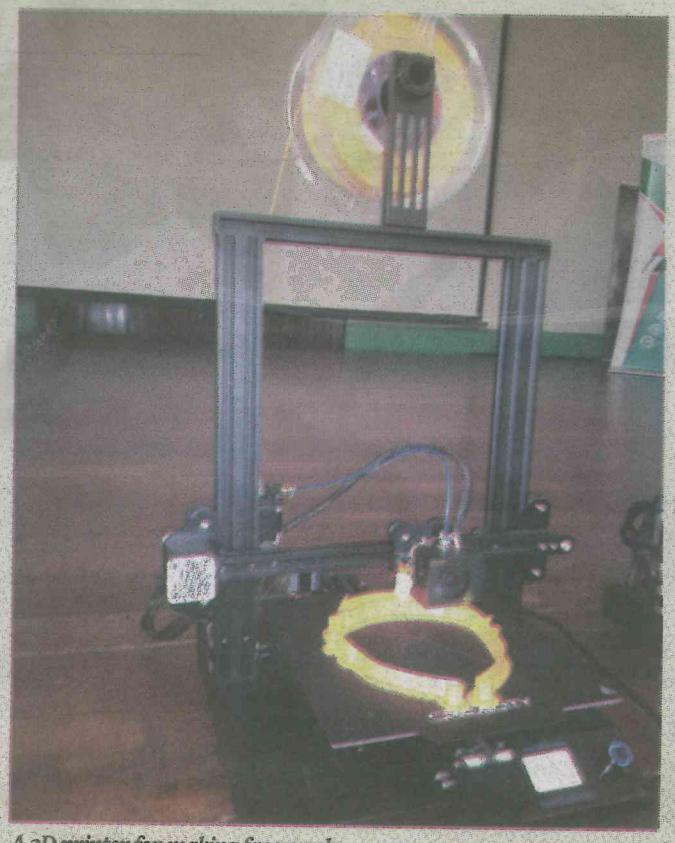
"Our thermal imaging system is very precise; it can't go beyond one degree Celsius in accuracy. The camera works even at night [in darkness]. This system globally costs between $50,000 and $60,000. However, it took us only $30,000 to build it," Banadda said.

Banadda said Uganda Revenue Authority waived taxes for all items Makerere University needed in development of the system and the 3d printing technology. Makerere imported three 3D printers each at Shs 180 million. A total tax of Shs 80 million for the three printers was waived.

The biodegradable transparent mask is made from cotton acetate and wood, Banadda explained, and it has anti-microbal features and other special features; for example, the wearer's breath does not create mist that disturbs one's vision and the plastic ring holding it unto the head was designed by doctors in such a way that it can't cause any discomfort. Above all, the wearer doesn't feel any need to keep touching and adjusting it like the common masks.

Banadda explained that these biodegradable and transparent face masks/shields are good for lecturing, public address and people at front desks because they don't interfere with one's speech. Each of these masks/shields would cost Shs 5,000 currently, though the cost could drop on mass production.

Thermal imaging system. A camera on a stand, a computer and a screen



A 3D printer for making face masks

Makerere researchers wrote their own codes for the 3D printers; they can now print anything. Banadda displayed several items they have printed such as human heart, the White House, a dog and plumbing pipes.

BULAMU VENTILATOR

A bit earlier, the low-cost Bulamu ventilator for Covid-19 control, developed by Makerere University, Ministry of Science, Technology and Innovation and Kiira Motors Corporation, was unveiled in June 2020. This fully functional prototype would boost care provision in event of Covid-19 surge and even any post-Covid-19 emergency that requires assisted breathing.

Vincent Sembatya, the director of Quality Assurance at Makerere University and the initiator brains behind Bulamu ventilator, told *The Observer* while ventilators on the world market cost between $30 and $45, Bulamu will cost $3,000 (Shs 10 million) only. He said the Bulamu ventilator project is still at pilot stage, conducting extensive engineering trials and endurance tests which are necessary before conducting animal trials, clinical tests and certification for use. Ultimately, it is part of Uganda's efforts to grow capacity for manufacturing key medical equipment for import substitution and regional export, he added.

> We [the university] have a lot of people with positive energy.... This university can lead to great transformation of the country

Sembatya said 3D precision manufacturing technology, which Makerere University has now acquired, has been deployed to manufacture the variety of components of the ventilator, an activity supported by the African Institute for Capacity Development (AICAD). The ventilator also has a solar panel so that it can continue to work when a patient is being transferred in an ambulance.

"Uganda had only about 50 ventilators at the start of Covid-19. On April 1, we put together ideas on how to make ventilators locally as global demand was rising very fast and denying us possibility of importation. We desired to have ventilators made and supplied cheaply and using locally available materials. So, we have used local ideas and local materials, but we are meeting international standards," Sembatya explained.

Sembatya said Makerere researchers are making even more innovations, such as nebulizers (electrically powered machines that turn liquid medication into a mist so that it can be breathed directly into the lungs through a face mask or mouthpiece.), oxygen concentrators and many others.

GUEST AND HOST

Lt Gen Charles Angina, deputy chief coordinator of Operation Wealth Creation, was special guest of the function. While thanking the university for initiating innovations that protect frontline fighters against Covid-19, he urged them to produce them in large quantities for local use and export.

Angina emphasized that thermal imaging system is very important to the defence forces because it can boost the capacity to fight at night. "We have been using third-grade night vision equipment. No country sells you its best technology, because they want to have an edge over you," he said.

Meanwhile, the function host, Prof. Barnabas Nawangwe, the university vice chancellor, noted that Makerere University has tremendous and diverse potential which is heavily underutilized. "We [the university] have a lot of people with positive energy.... This university can lead to great transformation of the country... We can and have been making many innovations. Innovations can be in any field and they need not just be [tangible] products; for example we can make innovations in our tourism or in our economics. Innovations are not for engineers and scientists only," he said.

Nawangwe announced that the university is planning to set up a science and industrial park at Makerere, dealing in all fields. He further disclosed that the minister of Education and Sports, Janet Museveni, has asked the university to compile a list of all their innovations so that government can consider how to boost them.