



KAKEHASHI AFRICA.



KA Innovate Series

INNOVATE

Technology transfer from Japan to Africa: Starting with Robotics

Webinar Report

Date: 20 June 2020
18:00 – 19:30 (JST)

Speakers:



Dr. Aiman Omer
Founder & CEO
WinRoad RTS

Adjunct Researcher
Waseda University



Mr. Busalire Emeka
Founder & CEO
Egalaxykenya LTD

PhD Candidate
Hosei University



Mr. Mohamed Muse Hassan
Director at IITE
Somalia

KA Innovate Manager

Average attendees: 50

In our second event in the KA Innovate Series, featuring speakers Dr. Aiman Omer and ABE Initiative Alumnus Mr. Busalire Emeka, our members learned more about the opportunities that robotics can provide Africa. It was an amazing event, which was highlighted with the breakout session lasting a further hour after the event completed. We have summarized the proceedings as follows:

The webinar was opened by Mr Hassan, the KA Innovate Manager. Mr Hassan reiterated the mandate of KA innovative. To nurture the minds of Kakehashi Africa entrepreneurs. Kakehashi Africa is a platform created to nurture the next generations of Africans and KA Innovate was founded with the notion of assisting members through education, training and support.

The webinar is a perfect demonstration of all the potential of Kakehashi Africa. We had the pleasure of having Dr. Aiman Omer, a Professor and Adjunct Researcher at Waseda, where he has been for the last 15 years. Dr. Omer also founded WinRoads RTS, a robotics company based in Tokyo. We also welcomed an ABE Initiative alumnus, Busalire Emeka who is currently a PhD candidate at Hosei University in Tokyo but who has also started an education technology startup in Kenya, Egalaxykenya, which produces robotics for teaching. Emeka-san is an excellent example of the human capital advantage that Kakehashi Africa has.



The webinar would address whether Africa needs robotics and artificial intelligent (AI) inspired machines. Dr Omer and Emeka San would provide answers to these questions. Mr Hassan highlighted the impact of robotics and AI in Africa during the Covid-19 pandemic, including some benefits such as Tunisia deploying service robots and Rwanda utilizing drone technology to deliver supplies to rural areas. However, there are people who criticize the utilization of robots as most African countries are dependent on semi-skilled jobs. Therefore, robots would increase the unemployment rate on the continent. But Africa needs large-scale production to stabilize and compete with the rest of the world. There are two arguments the speakers would address, i.e. for robotics in Africa or against robotics in Africa. Mr Hassan highlighted that KA Innovate is for all Kakehashi Africa members and ABE Initiative scholars, which can be used to allow them to shine.

Our CEO, Mohamed Farid, welcomed the webinar attendees and explained that because of the positive feedback from webinar attendees, KA Innovate would be hosting events twice a month, instead of one event per month as was initially announced at the inception of the series. The aim is to increase the events to one per week, where KA Innovate will be bringing more entrepreneurs, more CEOs and people who have created their own companies, particularly those who have created something innovative that link Africa and Japan. Farid-san, encouraged members who would like to share their experiences or have a story worth telling, to get in touch with KA Innovate, so that they may share their story, allowing other members to learn from them. Based on feedback, the webinar would also have a breakout session for networking on completion of the webinar.

Dr Omer Omer was introduced, who is an African, Sudanese and who has succeeded in creating his own company in Tokyo, Japan, Winroad RTS. Dr. Omer also has the same vision as Kakehashi Africa, to bridge Africa and Japan through transfer of technology and has the experience and knowledge to achieve this. Busalire Emeka, a PhD scholar, would speak about his experience in bringing robotics education to Kenya. With the featured speakers and KA Innovate manager, Mr Mohamed Hassan, the event would have a panel discussion with questions allowed from attendees.

Dr Omer was excited to share with our members, whom he considers to be the future of Africa. Dr Omer explained that he wanted to share his experience and how Africa can benefit from robotic technology. Dr Omer, who received his PhD from Waseda University in 2012, was also an assistant professor at Waseda University for five years and is now an Adjunct researcher. His company, Winroad RTS, was established in 2019.



**Robot technology,
how can Africa
benefit from the 4th
industrial revolution**



Robot technology, how can Africa benefit from the 4th industrial revolution



Dr Omer also assisted JICA by being a part-time lecturer at the Egyptian University of Science and Technology from 2012 to 2018, on the development of robotics. This experience taught Dr. Omer how to import this type of technology to Africa. Dr. Omer worked in creating humanoid technology and then later focused on developing medical robots. His dream is to transfer this knowledge to his home country, Sudan and home continent, Africa. Dr. Omer then asked what people understand by the term “robot”. Typically, robots are in a variety of different shapes. If you research the definition of robots, there are many definitions. Robot comes from Czech language meaning “forced labor” and first appeared in a 1920’s play, where machines appeared in human form and were there to assist humans by completing tasks. This was the inspiration for many science-fiction movies and stories. Therefore, the idea of robots originates from science fiction and is now reality.

Now there are different types of devices and different types of machines. The Industrial Revolution, which started in the 18th century, with mass production, started with the steam engine and mechanical power. At the end of the 19th century, we had electricity production and then mass production. In the middle of the 20th century came the age of the computer and the birth of robotics. The robot appeared in 1955. It was a simple arm that could pick up items and place them elsewhere. The first industrial robot was developed in 1959 and was used in the automotive industry in the United States in 1961. However, it did not do well in the US and the developer then went to Japan. The inventor cooperated with Japanese company Kawasaki and they developed many robots and it was in use in Japan. It contributed a great deal to Japanese industry. Japanese companies then started developing robotic technology in the 1960’s. Japan has contributed a great deal to the development of industrial robots, as highlighted by the number of patents filed by Japanese companies. Today, there are more than 2.4 million industrial robots globally, with an expected increase to 4 million in the next few years. In 2018, more than 422,000 units were shipped to factories around the world. Japanese companies are the highest producers of these industrial robots. The largest buyers of Industrial robots are China, Japan, United States, South Korea and Germany, which purchased 74% of robots produced in 2018. Africa and South America are not listed as few companies purchase Industrial robots in these regions. These industrial robots are mainly used in the automotive industry and other heavy industry. Currently, Industrial robots are mainly used in tasks that are deemed too dangerous for humans, such as welding and material handling. If you want to install a robot in your factory, it is a complicated task. You need to know the tasks you want the robot to do and then design the factory accordingly. There are specialized companies called system integration companies that assist with this function. These companies integrate and design the production line according to what is required.



Robot technology, how can Africa benefit from the 4th industrial revolution



We are currently in the 4th Industrial revolution with robotics, AI, Big Data and 3D printing. We are now seeing robotics entering other sectors besides heavy industry. These include agriculture, the medical field and logistics. Also, in sport applications and more notably, robots used in interviews showing the advancement of AI. Generally, Industrial robots are typically a robotic arm. But what is referred to as service robots, may come in a variety of shapes. Industrial robots must be in a structured environment with little or no human interaction. Service robots are in an unstructured environment and often interacts with humans. This is challenging for robot developers. A service robot, like Industrial robots, can be developed by one company, programmed and then sold. Or the programming and customization function can be outsourced to an external company, giving an opportunity for the growth of new start-ups in this industry. It is a challenging business as the risks are high due to the cost of production. When entering robotics, the following fields are important: mechanical engineering, electrical engineering and computer science. Some companies are just software based, where they purchase the robot and then program it, like the Softbank robot. Like developing mobile applications, these robots programming can be customized. However, if you want to build your own robot, then you may need to use system integration by obtaining components from different companies and then building a customized robot to service the company's needs. This is challenging, as it also requires the development of software. Designing your own hardware is risky, with many companies failing. Therefore, many companies focus only on software development, instead of hardware development. There has been great advancement in the robotic field with AI and biotech, which is why they are being used in many different fields now, with current applications in disinfection of areas and logistics. Robotic companies are working hard to find innovative ways to apply the technology during this Covid-19 era. Dr. Omer feels that some fields can benefit from robot technology, such as agriculture, medical and health care, mining and even demining of areas, especially in some war-ravaged regions of Africa. Logistics is already benefiting from the technology, as seen in Rwanda.

The challenge for Africa, is developing solutions that can benefit the continent. China and the US create solutions according to what they require. However, there are difficulties in doing this. Typically, robots that are shown in media are prototypes and not are not ready for market. Hence its important to create awareness and to educate people in this field. Funding is also difficult, especially for start-ups, as the risks are extremely high. Therefore, getting government funding would be optimal.



Robot technology, how can Africa benefit from the 4th industrial revolution

<https://www.winroadrobotics.com/>



Edutech, use of robotics in Education

Dr Omer explained that he founded Winroad RTS to help companies in the Middle East and Africa to learn about robotic technology. The aim is to connect companies to developers in Japan, therefore WinRoad RTS would help companies in Middle East and Africa on a consulting basis, finding the right solution and the right Japanese supplier while assisting with marketing and training.

Farid-san expressed his gratitude to Dr Omer for introducing the field of robotics to Kakehashi Africa members. As Japan is the biggest robotic developer in the world, this gives Kakehashi Africa an advantage due to our members' connection to Japan. Robotic technology applications have many possibilities, from medical applications as shown in Liberia during the Ebola pandemic, to assisting in traffic management and mining. Robotics has shown it will assist industry and create more employment opportunities. If Kakehashi Africa members know of an opportunity for robotics in Africa, KA Innovate can assist in helping members establishing a firm that would market it in their respective countries by helping members connect to experts such as Dr Omer.

Busalire Emeka, a PhD fellow at Hosei University in Tokyo and ABE Initiative alumnus, was introduced, who has established his startup in Kenya in Edutech. Emeka-san explained that the startup life is lonely but gets better with time. Emeka-san looked at the STEM gap in Africa and how it can be addressed with education, using robotics. Emeka-san established his start-up in Nairobi in 2013, after completing his undergraduate degree in Kenya in Computer Science. As a software engineer, Emeka-san first started by consulting, doing software development. After completing his Master's in Japan, Emeka-san interned with a Japanese robotics company and then had the idea to use robots to teach Africans, specifically Kenyans about STEM (Science, Technology, Engineering and Mathematics). Emeka-san has experienced different start-up ecosystems. In Silicon Valley in 2016, when he visited Stanford University and in Africa, he experienced the start-up ecosystem in Nigeria and Kenya, which are both vibrant. Emeka-san has also been involved in the Japanese start-up community, though it may be difficult to compare to Western ecosystems. The importance of sharing these experiences is to highlight some key factors of creating a startup, namely, your network and how to attract early funding. Emeka-san believes that the most difficult aspect of start-ups is attracting early funding. To do so, it is important to grow your network. Emeka-san included some interesting facts about Africa. Africa currently holds 70% of the world's population, though STEM education is lacking and behind from other countries.



Edutech, use of robotics in Education



Also, 60% of African countries are under 25 years old, and there are projections that by 2025, all of Sub-Saharan Africa will have a working population larger than the entire rest of the world. Emeka-san notes that although the size of the working population is a plus, most students in Africa do not take an interest in STEM subjects. According to Emeka-san, the challenge that African countries face is that most STEM focused professionals do not stay in Africa but pursue careers outside of the continent, or as he puts it, “a leaking bucket”. While some individuals may claim that China is taking over Africa, actually it is the case that Africa has been resource constrained and is forced to outsource to foreign markets.

Emeka-san motivated us by envisioning a bright future, where students who have the opportunity to study in foreign countries through scholarships such as JICA or MEXT, are able to invest back into their countries. Emeka-san then demonstrated a short video to introduce his company and their vision. Essentially, Emeka-san’s start-up utilized robots in order to teach young students about the STEM concepts. This idea came while Emeka-san was an intern in Fukui, Japan for an EduTech company, and decided to bring back these ideas to his country. Currently, his company is running a pilot and is conducting A/B tests in order to find the exact market fit. Obviously, this idea struck a lot of interest and has gained quite a bit of momentum. Not only have some Japanese companies been attracted by this new idea, but also in Kenya some wealthier families who are looking to expose their children to these skills and skillsets have been intrigued by this idea. Emeka-san admits that setting up this type of start-up has had a few challenges. The first was that funding can be a little difficult to acquire, especially because there have been some government funded programs that are available free of charge, thus creating difficulty in charging customers for their services. It has also been difficult to identify the exact market, or who will be the paying customer. That is why Emeka-san decided to utilize A/B testing to test between privileged and underprivileged communities to see which community would be better suited for this type of model. Start-ups can also have the unique challenge that while the pilot is doing well, there can be unprecedented changes in the market, such as early this year with the onset of Coronavirus. Because of coronavirus, the pilot in the communities was not able to continue running, both from the privileged and underprivileged communities. So, everything had to be brought to a stop. But with challenges, there are ways to solve the problem. They had to brainstorm in order to figure out how to navigate these changes. So, they came up with the solution of online delivery. Interestingly enough, Emeka-san had been hoping to go online after two or three years of piloting, but the new changes brought about a need to implement that strategy now. They would post the training materials online, and now the materials could be accessed by the children but also by special new groups that were interested in the program. The teachers are also taught how to create and package their own courses, in order to motivate their own ideas and independence. Emeka-san then introduced some of the sample course content that is made available through these courses. Teachers who teach STEM subjects can utilize those materials to create their own content and upload it on the online E-learning portal to monetize the content and share their ideas and knowledge with other interested parties, who are the students.



Edutech, use of robotics in Education

In conclusion, Emeka-san makes some notes on his reflections and experiences in establishing a start-up. Firstly, embrace previous start-up methodologies that have been implemented in the past. One common methodology is the “Lean Start-up” methodology, which essentially allows you to build a product and metrics to know what you need to refine and improve before an official launch and learn from those observations and repeat the cycle. Another important aspect Emeka-san mentioned is having metrics to measure your products performance. Emeka-san makes the point that often people think erroneously that once you should build something, consumers and interested parties will gravitate towards your product or service, but in fact, it is your responsibility to attract and bring interest. There is a sense that you should build something first and convince the interested parties to come, and that is done through solving a problem or satisfies a need. So, Emeka-san concludes that it is important to build something that can satisfy a specific need. Sometimes the funding will come from friends or family, or from some savings you have, but the most important thing is to solve a problem that aligns with your own core competencies. You can even team up with a friend who believes in your idea and can improve or bring value to your company. Emeka-san encourages those who are still in Japan studying to use this time to create ideas and take note of what problems need solutions and then to start developing ideas. The point that Emeka-san made was that attracting investors in the early stages is very difficult, and that is because of the availability of technology and the increase in start-ups. This means that most investors are looking are less risk and are only interested in likely successful ideas and companies. Emeka-san brought great insights for aspiring entrepreneurs.

Farid-san expressed his gratitude to Emeka-san for his insights in regard to establishing a start-up. Education, especially post-Coronavirus, will certainly change, and Africa can also take advantage of that change to take steps forward.

The panel discussion then began, and the first question was related to innovation in Africa and Japan, specifically, “how to share more about the innovation of Japan and Africa?”

Hassan-san tackled the question by noting that KA Innovate was established to spread and grow the network and share knowledge and information. KA Innovate also establishes the vision of bringing Japanese knowledge to Africa through businesses and start-ups. It is important to prepare for the future as Africa’s population grows. KA Innovate essentially serves as an incubation exhibition department for Kakehashi Africa, and to connect strong African entrepreneurs to Japan, and bringing like-minded pioneers together.

The next main question was related to how to increase impact to the Africa, especially as many Kakehashi members are interested in education.

Emeka-san mentions the importance of early education and to increase exposure to African students. He notes that the benefit of being connected with other member is that, instead of having a similar idea and starting from scratch, a member can connect with other members who have similar ideas and utilize previous blueprints to establish their ideas in their own countries.





Partnership with other members of with KA Innovate is extremely powerful and encouraged for any members who have such interests.

Dr. Omer then clarified that in order to develop marketing for Robotics companies, we must first classify what kind of market and what kind of industry to implement the robot system. Dr. Omer said having some knowledge of the application of robotics is important. Some of Dr. Omer's contacts, who came from a business or economics background were able to successfully establish Robotics companies in the Middle East, though they did not have a formal background in Robotics

Farid-san encouraged Kakehashi members who are interested in developing Robotics solutions in Africa, especially because the Robotics industry is aimed to grow in Africa, and Japan now has 52% of world Robotics production.

The third question was, "what makes a good entrepreneurial ecosystem, and how can Kakehashi members create their own ecosystems to support entrepreneurial endeavours?"

Hassan-san used for reference the current program he is working on which is connected between Netherlands, Somalia, Nigeria, and Mali. This program targets unemployed youth who graduated from university. This program provides training and connects them with financial institutions. In this case, there are multiple stakeholders in one ecosystem. So, the students from the universities are connected to financial institutions after they are trained and are sent them into the market. Another program that Hassan-san referenced is a platform that brings experts together, such as students, job posters, education institutions, financial institutions, new platforms – so these different players come together, and each stakeholder can be connected to each other. This is something Hassan-san stated he would hope to scale up and also implement into KA Innovate. These resources are good to bring together different players into one system.

Farid-san thanked Hassan-san for his insight and encouraged Kakehashi members who want to establish start-ups in their communities or countries to take advantage of these resources.

The next question was aimed at Dr. Omer, namely, "what are the three best advantages and disadvantages for implementing Robotics in Africa?"

Dr. Omer stated that there are in fact many benefits, such as establishing and growing industries in Africa, completing tasks with Robots that would otherwise be dangerous for humans to accomplish, increasing quality of life, and developing technologies. However, robots could replace human workers, which would be a disadvantage for a continent with such a large population. There are also some dangerous scenarios where Robotics can be used for weapons or for crime.

Farid-san thanked Dr. Omer for his clarifications.

The next question went to Emeka-san, specifically related to his start-up, "If this start-up idea were repeated in another country, can the idea be completely online and remote or is it necessary to have a physical location?"

Emeka-san mentioned that because his model targets children, it is not possible to completely eliminate the physical location, but from his experience, it is possible to have mobile classes.



Classes can be set up anywhere, but of course you must have a central place where others can access the material or the hardware, but you can plan or organize where you will have your group. You can even have a class in a private school. In Kenya, there are ballet and karate professionals that follow your location in order to provide the lesson, and the same concept can be extended to STEM. So, if a teacher will teach STEM concepts on Fridays or on Mondays, you can bring your materials and unpack them right in their own location and offer a lesson. Emeka-san notes that the mobile version is more practical because with children, you cannot eliminate the physical interaction aspect.

Farid-san thanked Emeka-san for his input and moved on to the last question for Dr. Omer, “Some countries utilize Robotics as a solution for the problem of lack of human resources, but Africa doesn’t have this problem. So, is Africa really at a stage where it needs Robotics, and what kind of industries really need Robotics and how do we integrate this?”

Dr. Omer admitted that there are many concerns that Robotics can take away jobs and employment. But Dr. Omer states that Robotics technology developments have not given Robots the power to replace humans but to assist humans. That is certainly an advantage to make processes more efficient. For example, Robots were used for tasks such as welding or painting, such as in the automotive industries and electronics industries, but now new developments should Robots being used in new industries such as the food industry, textiles, and retailing industries. Dr. Omer then clarified that it does depend on the business model. Creating a business shouldn’t just be viewed as creating an income but also as creating more jobs. This is a connection between business ethics and your own personal aspirations.

Farid-san thanked Dr. Omer and concluded the session. The final important point was made that Robotics will not harm the economy in Africa but in fact, will increase the economy because there are some industries that are currently impossible without the implementation of Robotics. We must discern which industries would benefit from the use of Robotics and which industries wouldn’t, at least not yet. Robotics has great potential to enhance the Agriculture business in Africa, such as drones that can hover over crops and identify which locations need more water or soil, simply by scanning the crops everyday, which would be very difficult for humans to do every day. Farid-san then thanked all speakers and guests for their insights and attendance.

This marked the end of the second event in the KA Innovate Series. The session continued with a networking session in breakout rooms.

If you would like to contact KA Innovate for assistance or if you would like to connect with experts in a specific industry, email KA Innovate :
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