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"We intend to diagnose a billion people by 2025 for multiple diseases across multiple countries"

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BioSpectrum interacted with Aviruk Chakraborty, Founder and Managing Director, Archeron Group, Bengaluru

After conducting the world's first AI based public health trial in Dubai for TB x-ray identification using neural networks, UAE based Archeron Group is now exploring plans to work with the Ministry of Health in India towards the 2025 TB eradication agenda. With its global development and delivery centre in Bengaluru, the technology company is also developing AI and quantum computing based solutions to help India fight the current pandemic. BioSpectrum interacted with Aviruk Chakraborty, Founder and Managing Director, Archeron Group, Bengaluru to find out more about the company's healthcare solutions.

Edited excerpts-

Please provide us with a comprehensive overview of the company's AI enabled healthcare solutions.

Over the last 4 years, we have developed a slew of cutting-edge innovative healthcare solutions using Artificial Intelligence (AI) and an intelligent software and hardware integration.

Healthcare Kiosks- We have developed a touchless healthcare diagnostic kiosk which provides an end to end diagnosis and treatment of a person through AI. We provide complete diagnostic solutions during the walk-in stage such as triage, remote diagnosis, healthcare insurance automation and second opinion using these multiple kiosks based across the world. Our healthcare kiosks have been designed to provide a proactive medical treatment rather than a reactive medical treatment. We start with basic human body parameters and measurements starting from weight, height, BMI, Blood Pressure, Pulse, temperature of human being along with carrying out a diagnostic triage for checking the requirement of carrying out an x-ray. The kiosks also come with an FDA approved technology for needless blood extraction from the arm.

COVID-19 detection kiosk- We are developing COVID-19 detection automated kiosk which has 3 primary mechanisms for detection of diseases with a unique advantage of being the only non-transmitting framework for COVID-19 testing as all other frameworks have human interaction or a hospital visit which leads to contamination.

Predictive Diagnostic Platforms- We have also created an integrated national radiology where the radiological plates of all the patients all over the country are analysed and a diagnostic support system is created in which the doctors are given a second opinion on the radiological plates. Additionally, in the national pathology platform we analyse not only blood but also various other pathological slides through deep convolutional neural networks with which we use the datasets available across the globe to train the neural nets on various diseases.

TB analysis- To tackle the problem of automatic detection of tuberculosis (TB) from digital x-ray images, we employ a Deep Neural Network based approach. Specifically, we use the well-known VGG-16 model for feature extraction, and then train a

small multi-layer perceptron to classify the features into the two classes being normal and TB. We use python and tensor flow as the scripting language and the framework for our algorithm respectively. **Personalized Cancer Treatment-** One of our other focus areas is in the application of Crispr Cas-9 for creating personalized medicines for multiple types of cancer using CAR (Chimeric Antigen Receptor), T cell therapy and other genetic disorders. We are currently in the process of starting clinical trials on animals with an aim to solve blood and brain cancer. We will be doing clinical trials in USA, UAE and India, subject to regulatory approvals. Once admitted to human clinical trials by end of 2020, Q1 2021 this will be the 4th clinical trial globally where Crispr Cas-9 is being used in oncology treatment using immunotherapy. The objective is to enhance body's own immune system to fight and kill cancer cells.

Where all have these solutions been implemented? What is the outcome?

We have made use of our cutting edge solutions to collaborate with various governments and organisations globally such as, MIT, Harvard Medical School, Kingdom of Saudi Arabia, UAE's Ministry of Health and Prevention. Our larger objective for the healthcare space, for which we are collaborating with multiple governments across the world, is to provide AI based automated diagnostic triage with a focus on rural medicine. We have done so by developing and deploying a national radiology and pathology platform in collaboration with the Ministry of Health and Prevention, UAE which was unveiled at Arab Health 2020. We now intend to deploy these solutions in India and are in conversations with the Ministry of Health and a couple of state governments, including the Andhra Pradesh Government to create remote rural healthcare diagnostic platform.

What are your plans to work with the Ministry of Health in India towards the 2025 TB eradication? When will the work start?

We are aligned with the Government of India's vision to eradicate TB from India by 2025. We have already implemented our solutions in UAE, wherein our AI software solution identifies Tuberculosis in Chest X rays, the hardware for which is provided by the government. This was the world's first AI based public health trial. In emerging markets and rural markets where a suite of hardware is not present, we solve the problem by deploying our own healthcare kiosks. We intend to diagnose a billion people by 2025 using our AI hardware and software for multiple diseases across multiple countries. An advantage of having such a large screening protocol using AI globally, is that a large share of TB patients can also be diagnosed using the same kiosks given that Chest X ray is one of the primary tools of preliminary diagnosis of TB.

We want to work with the Ministry of Health in India to restart the 2025 TB eradication plan with a new vigour once the COVID-19 pandemic subsides.

How do you plan to set up a rural diagnostic support infrastructure in India?

We are looking at a hybrid Public-Private Partnership model and asking our collaborators to volunteer. We are also looking at spaces that people can voluntarily provide for us to set up the kiosks. We will deploy hybrid financing models for this using traditional as well as developmental methods such as acquiring finance from World Bank, Inter-American Development Bank and KfW Development Bank.

What are your contributions in the fight against COVID-19?

We are developing an intelligent kiosk with COVID-19 detection facilities. This is a touchless diagnostic healthcare kiosk which can provide a holistic and complete diagnosis and treatment of a person using AI. COVID-19 detection automated kiosk has 3 primary mechanisms for detection of diseases with a unique advantage of being the only non-transmitting framework for COVID-19 testing as all other frameworks have human interaction or a hospital visit which leads to contamination. The three primary mechanism include thermal cameras and AI, x-ray based diagnosis using AI and strip test using blood for an antigen, antibody test.

What are the major future plans of the company?

Over the past 4 years, we have built significant IP and carried out extensive research that places us at par with the biggest multinational organisations that are working in the field of quantum computing and AI globally. We are currently exploring various collaborations with the state and central government of India to deploy our solutions in the country such as AI based rural diagnostic support infrastructure, AI enabled TB identification and so on. We have significant investment plans for the country and are looking to more than triple our workforce in the country over the next two of years.