TRANSFORMING AFRICAN MEDTECH CONFERENCE

TAMC REPORT 2023

Villgro Africa & Jaza Rift Ventures, in collaboration with Rice360 Institute for Global Health Technologies, Kenyatta University, PDP Forum, Ifakara Innovation Hub and EA Biodesign, convened the first annual pan-African medical technology conference at Mercure Hotel Nairobi 0n 24-25 August 2023. The goal of the conference was to build a vision for the future for a comprehensive and transformative African medical technology industry.

This 1st annual Transforming African MedTech Conference (TAMC) in Nairobi, Kenya welcomed over 100 guests from across Africa, and beyond, to assess the current status of medtech development on the continent and map a way forward that will strengthen the sector and improve partnerships between different sectors. By increasing linkages across the continent, the conference aimed to strategically support the realisation of locally conceived, developed and manufactured medical technology that can be distributed and used throughout the African continent.

For the purpose of this conference, **medtech** was defined as medical devices and equipment, robotics, artificial intelligence (AI), and wearables.

The two-day conference saw stakeholders, policy makers and academics share their expertise and insights, drawing from their respective experiences and backgrounds, which spanned various aspects of the medical technology ecosystem. They explored potential collaborations and synergies, seeking ways to combine their resources, knowledge, and innovative capabilities to tackle some of healthcare's most pressing challenges.

As the conference progressed, a shared vision began to take shape. It included strengthening the MedTech innovation ecosystem, including education, technology, product development, investment, technical assistance, manufacturing, regulation, trade, and tax policies. Additionally, leveraging emerging technologies to enhance patient care, improve diagnostics, increase accessibility to healthcare services, and ultimately save lives. The nascent consortium is determined to create a future where locally developed medtech is seamlessly integrated into the healthcare system, empowering both patients and healthcare providers.

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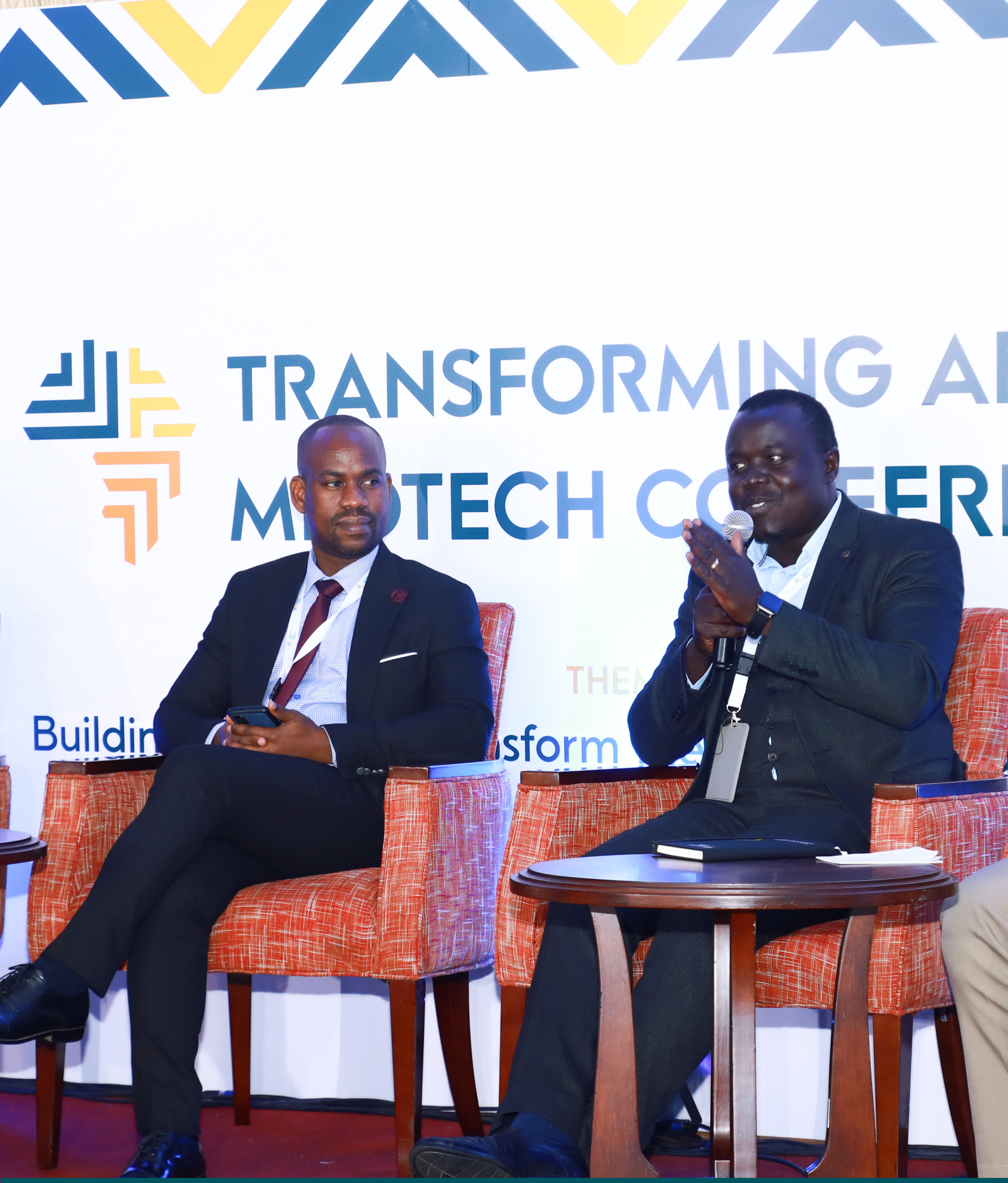


DAY 1

Vision Setting Meeting

The conference organizing committee, led by Eng. Wambui Nyabero, key partners and guests started the conference by discussing the vision of both the conference and the follow-on work. This meeting served as a pivotal gathering to set the tone for the conference. At the heart of this meeting was a collective aspiration to advance Medtech in Africa by harnessing the power of collective engagement. The partners recognized the challenges in the field and new opportunities for collaboration. Some concrete goals were articulated, including:

- Accelerating the timeframe from ideation to commercialization to be actualized through collective use of expertise from across the continent.
- Identification of gaps and challenges to help set the stage for setting an action agenda to bridge gaps in expertise, infrastructure, policy, etc.
- The critical nature of collaboration between different stakeholders (e.g., building bridges between academia and private industry).
- The key goal of import substitution by a local medtech industry.

Welcome to the MedTech Conference

Ms. Khatuchi Khasandi (Director of Partnerships at Rice360 Institute for Global Health Technologies) and Eng. Wambui Gachiengo (Villgro Chief Technology Officer) opened the conference by welcoming delegates and articulating the goals of the conference. Their opening remarks outlined the conference's objectives, provided a clear roadmap for the proceedings, and demonstrated the shared vision and commitment toward developing the African medtech ecosystem. This set the stage for meaningful dialogue during the conference.

Patient Story by Dr. Moses Ochora, Photokabada

Dr. Moses Ochora is an innovator and pediatrician working at Mbarara University of Science and Technology and Mbarara Regional Hospital. This regional hospital treats 5,000 children, 60% of which are newborns. They struggle for space and the right equipment. Donated equipment is often received without manuals, making it difficult for medical professionals to understand how to use it effectively. This equipment rarely comes with spare parts, so if any part of the machine breaks, the entire piece of equipment becomes useless.

With a compelling narrative that tugged at the heartstrings of everyone in the audience, Dr. Ochora painted a vivid picture of the harsh realities faced by those in underserved regions. He outlined challenges due to lack of devices, poverty, device maintenance difficulties, intermittent power, among others. His story not only emphasized the pressing need for innovative solutions but also underscored the conference's central mission – to bridge the gap in healthcare through technology. Dr. Ochora's heartfelt account served as a powerful call to action, motivating participants to engage in the conference with renewed determination, and reminding them of the tangible impact their work could have on improving the lives of countless individuals in similar circumstances.

Opening Remarks by Chief Guest Prof Paul Wainaina Vice Chancellor of Kenyatta University

We were honored to have Prof. Paul Wainaina, Vice Chancellor of Kenyatta University as our chief guest. He welcomed all in attendance and spoke about the transformative power of partnership between industry and universities. He acknowledged the need for universities to collaborate with industry partners so as to address healthcare challenges facing the continent. This, in turn, helps shape the curriculum content as it will be market driven.

Prof. Wainana emphasized that academic institutions are often the birthplaces of pioneering concepts and technologies, but bridging the gap between academia and industry demanded a multifaceted approach, including securing funding,

navigating complex regulatory pathways, forging strategic partnerships, and addressing market demand. By drawing attention to these hurdles, Prof. Wainaina advocated for a more streamlined and supportive ecosystem that facilitated the transformation of academic innovations into tangible, market-ready products, ultimately promoting economic growth and societal advancement through knowledge transfer and entrepreneurship. He reiterated the university's commitment to strengthening partnership and linkages with the private sector, regulatory bodies and professional organizations so as to keep both staff and students aligned with current trends in medtech.

Keynote Address by Dr. Victor Konde, Scientific Affairs Officer with the United Nations Economic Commission for Africa (UNECA)

Dr. Victor Konde of the United Nations Economic Commission for Africa delivered an address titled 'Transformative Potential of a Robust African MedTech Industry.' His address focused on building capacity and human linkages, with particular interest in investing in people and not simply in innovation. Africa carries a heavy disease burden and the gap in providing healthcare comes at a significant cost. Dr. Konde pointed out that the continent imports over 90% of its medtech and many regions face shortages and limited service because of the lack of medical technologies.

Dr. Konde's framework for medtech transformation centered around three essential pillars: health, knowledge, and economy. He recommended aligning the medtech space with African health challenges, leveraging the expertise of African biomedical engineers and driving economic empowerment through innovation. He mentioned the role of universities in promoting innovation and entrepreneurship in the medtech space and stressed the need for affordability and accessibility as key principles for the medtech ecosystem.

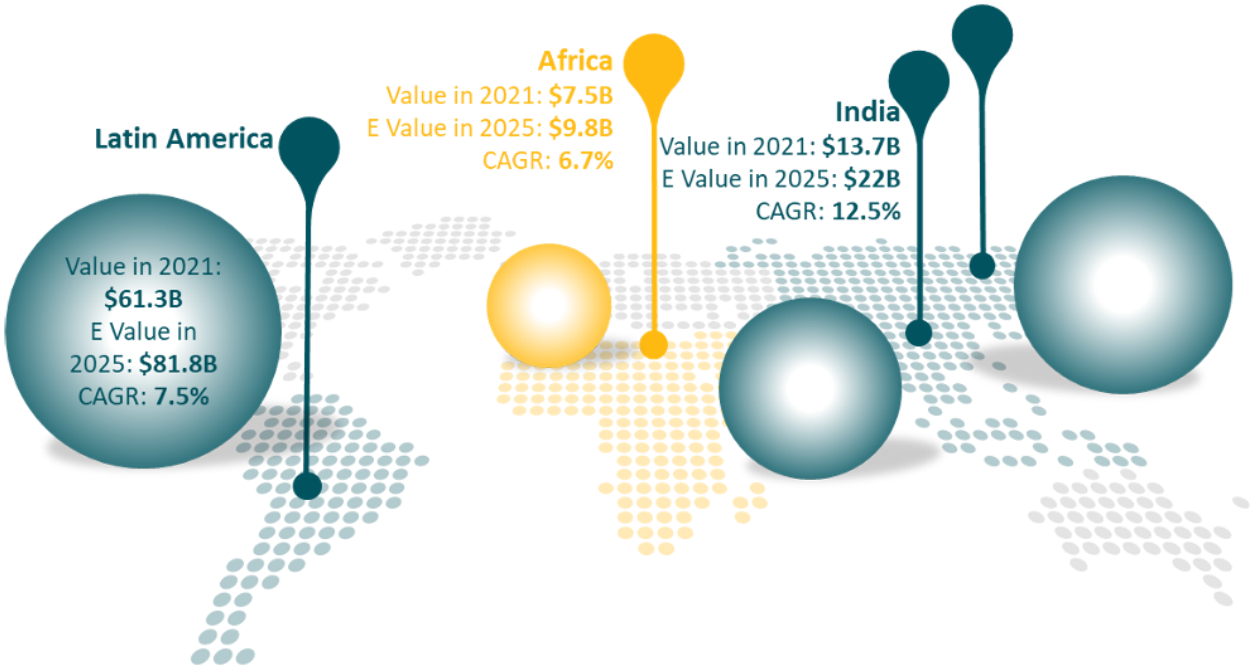
MedTech Ecosystem Landscape Discussion

Eng. Wambui Nyabero led a panel and preceded the discussion with an overview of the medtech ecosystem in Africa. She was joined by panelists: Phoebe Khagame (Oxygen Alliance), Dr. Kamau Gachigi (Gearbox Kenya), and Wilfred Njagi (Villgro Africa).

Moderator Eng. Wambui Nyabero Presentation

Africa has a medtech market of 7.5 billion USD compared to India's market of 14 billion USD. India is ahead in terms of a local medtech industry.

On the African continent, South Africa and Egypt are the largest markets, while Nigeria, Kenya, and Morocco have significant markets. Other countries have limited market size data; these data gaps need to be addressed.



Sources: IQVIA, 2021

Drivers of medtech in Africa include

1. Access to funding – We need an increase in venture capital firms, catalytic investments, impact investors, and state grants and loans.
2. Biomedical engineering training – Universities with biomedical engineering have increased.
3. Increased manufacturing capacity at the local level
4. Demography and epidemiology – Africa has a population of 1.2 billion, with a predicted growth of 2.3% each year. There is also an increase in the disease burden of non-communicable disease, constituting up to 37% and overtaking infectious diseases.

Some issues identified in preparation for the conference included:

- Limited data and information on the medtech industry in West and North Africa.
- The African continent is responsible for a significant percentage of the world's raw materials that are used in medical devices, but most medtech components need to be imported.
- A drastic gender imbalance was identified, with 80% of medtech founding teams being only men.

Panelist Discussion

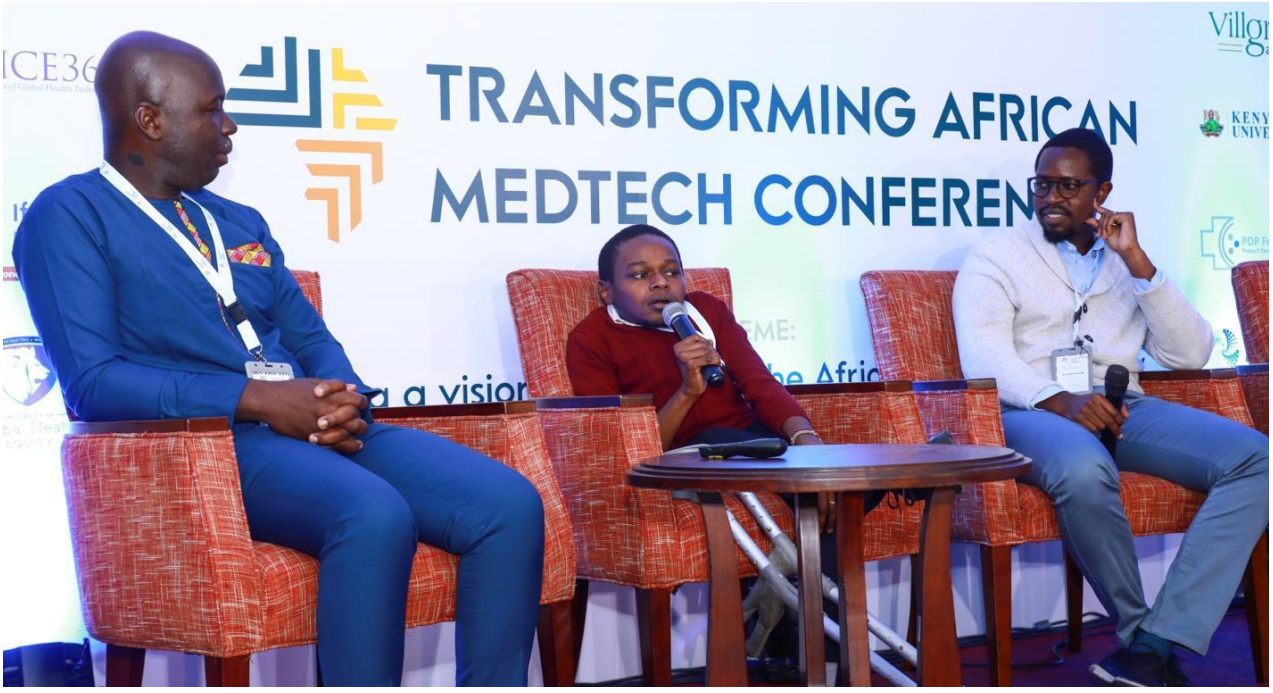
Wilfred Njagi highlighted India's success story in managing to build a sustainable technology ecosystem. Through deliberate policies and partnerships with international organizations, talent has been retained and expanded over the years. He referred to Suzuki Maruti manufacturing in India as well as other linkages with international organizations manufacturing medical devices in India rather than importing.

Phoebe Khagame shared the work of Oxygen Alliance and the need for partnerships in maintaining and repairing medical equipment. She highlighted the need to create and sustain resilient healthcare infrastructure in low- and middle-income countries. Ms Khagame not only brought attention to the pivotal role that collaborative efforts play in addressing healthcare disparities but also underscored the long-term significance of building robust systems capable of withstanding challenges and delivering essential medical services to vulnerable populations. She identified key stakeholders in the healthcare space, including government (Ministry of Health), professional associations or societies for engineers, manufacturers, academic institutions, and co-creators. She noted that through collaboration, sustainability could be achieved.

> There is beauty in being the first, but beyond that, there is brilliance and satisfaction in being sustainable.
>
> Ms. Phoebe Khagame

Dr. Kamau Gachigi, founder of Gearbox, spoke about the need to be competitive in the manufacturing industry. He stated that although the African continent has the skill sets to manufacture products, there is a need for protection of the fledgling industry. He noted that there needs to be a clear reward system for every step from ideation to development, manufacturing, and market entry. He highlighted that universities can enable innovation by removing barriers that limit disruption. When a university takes proactive measures to eliminate the red tape entangling its administrative processes, it paves the way for a dynamic ecosystem of innovation to flourish. By simplifying bureaucratic procedures, the institution empowers its students, faculty, and researchers to focus their energy on creative endeavors rather than navigating cumbersome paperwork and approvals. Dr. Gachigi also shared a suggestion that engaging governments through the military could increase the resource base as the military has a keen interest in developing medtech.

Financial Sustainability in MedTech



Sewu-Steve Tawia (Jaza Rift Ventures) led a panel discussing the availability and sustainability of financing in medtech. He was joined by panelists: Mr. Bernard Chiira (Innovate Now) and Mr. Arnold Mwangi (DOB Equity).

Sewu-Steve Tawia shared that the team, product, and market size are important considerations for potential investors in hardware technology. Firstly, the expertise, experience, and vision of the team behind a medtech venture can make or break the venture. Investors keenly scrutinize the team's ability to execute the envisioned solution and navigate the complexities of the healthcare industry. Secondly, Mr. Tawia emphasized the importance of evaluating the product itself; the innovation should not only address a pressing healthcare need but do so with uniqueness and potential for scalability. Lastly, investors are drawn to ventures with the potential to tap into substantial and expanding markets and have a deep understanding of the target market's size, demographics, and unmet needs. The key insight was that the decision to invest in medtech, particularly hardware technology, is a multifaceted process that extends beyond financial considerations.

Bernard Chiira shared the model of Innovate Now, an accelerator that supports assistive technology start-ups in their journey to market. They provide services in business development, product development, and marketing. Funding for Innovate Now is a result of a partnership between Global Disability Innovation Hub, ICT Norway, and Norad. This collaborative approach not only underscores the global importance of their mission but also ensures a sustainable future for the assistive technology ecosystem, bringing us one step closer to a world where technology empowers and enhances the lives of people with disabilities. Mr. Chiira talked about the startup valley of death; a stage where startups invest capital and time before breaking even. He suggested that the work of enablers is to ensure that startups spend minimal time in this stage to ensure survival.

Arnold Mwangi shared the work of DOB Equity, which invests in impactful technologies in East Africa. Headquartered in the Netherlands, DOB Equity is an evergreen fund that invests in entities aligned to the Sustainable Development Goals. The fund continually reinvests its returns into new investments, allowing it to sustain its operations and continue supporting businesses in line with its mission over the long term. Mr. Mwangi highlighted that startups should remember that investors have to get a return on their investment. When pitching to investors, founders should remember that they are not pitching a product but a company. They need to show that they are solving a real need that will produce revenue. He talked about regulatory approval and the time taken in research and development as primary risks for medtech companies. To reduce R&D time, he suggested collaboration with academia. He also advocated that startups join incubator or accelerator programs to enhance their business case. He also spoke about the need to protect intellectual property by having a comprehensive IP strategy.

The challenges in investing in the medtech space include a lack of proper awareness, lack of patient capital, limited success stories, and commercialization challenges. With this in mind, Mr. Mwangi talked about the importance of cost subsidies to assist innovators to develop locally, investor partnerships to de-risk investments, user validation of products, private public partnerships for market entry, and favorable government policies.

What does African-centered MedTech look like?

Dr. June Madete (Kenyatta University) led a panel with Daniel Atwine (SOAR Research Foundation), Dr. Data Santorino (CAMTech), and Dr. Muhammad A. Rushdi (Cairo University and New Giza University)

Dr. Santorino noted that it is important to develop and protect IP in Africa as well as in the global market. He highlighted the importance of filing for intellectual property protection and maintaining those protections. To develop the medtech ecosystem in Africa, intellectual property is important because it serves as a safeguard for innovative ideas, designs, and technological breakthroughs that are essential for the growth and sustainability of this burgeoning industry. By securing these legal protections, African medtech innovators can confidently invest in research and development, knowing that their intellectual assets are shielded from potential infringements or unauthorized use. This not only encourages local talent but also attracts foreign investment, fostering a dynamic environment for innovation and the development of groundbreaking medical technologies.

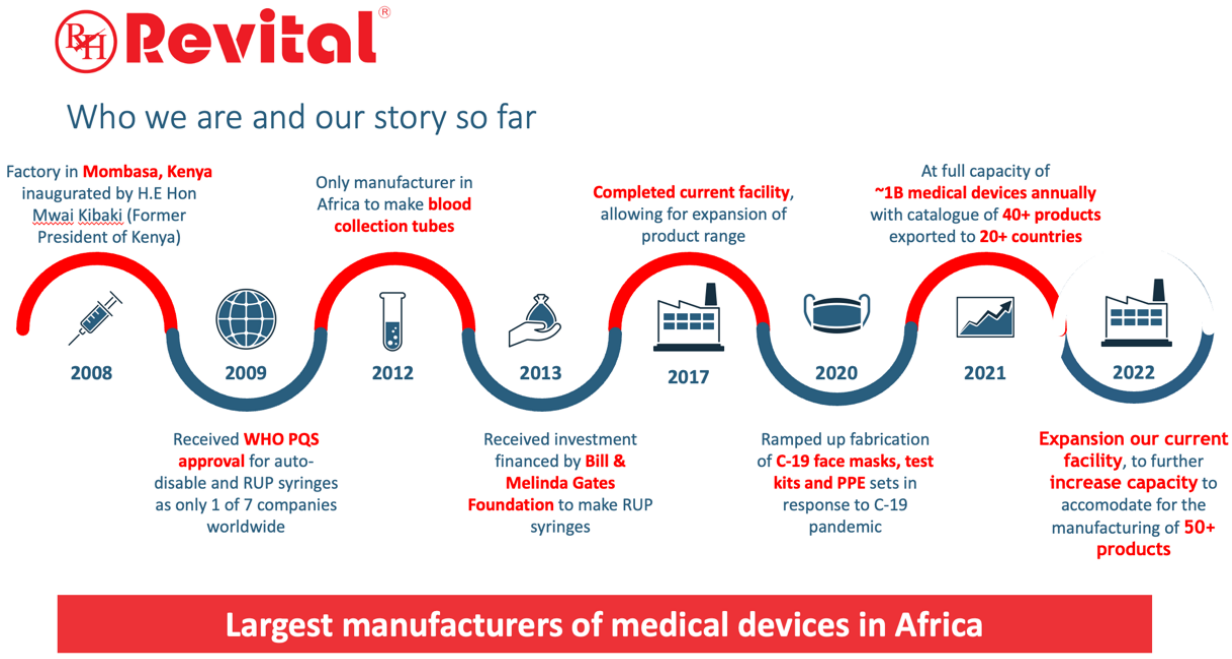
Dr. Atwine's emphasis was on the care needed to introduce medical technologies to the market, and he underscored the critical importance of safety in healthcare innovation. The extensive testing and approval processes serve as a safeguard against potential harm to patients. These stringent measures ensure that any medical device or technology entering clinical use has undergone thorough evaluation, minimizing the risks associated with their application. Dr. Atwine's message reinforced the principle that patient safety should always take precedence over expeditious adoption of new technologies. He encouraged a holistic approach to healthcare technology development, where cost-effectiveness is achieved through thoughtful planning and optimization, ultimately benefiting both healthcare providers and patients.

Dr. Muhammad Rushdi emphasized that it is critical to have thorough training at the university level to build a successful medtech industry. He highlighted the enablers in Egypt such as scholarships and industry partnerships that allow innovators to gain more experience in medtech. Dr. Rushdi underscored the pivotal role of comprehensive and specialized education at the university level as a cornerstone in establishing a thriving medtech industry. Additionally, he talked about how during COVID-19, the government focused on encouraging innovation through funding coupled with partnerships between universities and private industry. He mentioned that despite having many biomedical engineers graduating, there is still a need for more focus on hardware devices.

Local Manufacturing Capacity

Dr. Kamau Gachigi led a panel on local manufacturing capacity. He was joined by panelists Mr. Roneek Vora (Revital Healthcare), Eng. Gabriel Bruwer (Sinapi Biomedical) and Eng. Habtamu Abafoge (Simbona Africa). The panelists shared valuable lessons on fostering sustainable manufacturing practices from their experiences in manufacturing within the African context.

Roneek Vora of Revital Healthcare shared his organization's journey, which is a family company that started manufacturing sweets and is now a leading manufacturer of syringes, needles, blood collection tubes, lab items, tubing, personal protective equipment, and COVID Tests. They distribute their products to 16 countries including Kenya, Namibia, Zimbabwe, Canada, Brazil, India, and Pakistan. Revital has many partnerships such as Unitaid, UNICEF, USAID, PEPFAR, PATH, FIND, Bill and Melinda Gates Foundation, and John Hopkins University. These partners provide financial support and have helped Revital develop its manufacturing capacity, manage its intellectual property, and build market pathways and distribution networks.



Habtamu Abafoge of Simbona Africa, an Ethiopian-based medtech company specializing in the local design and production of medical equipment, offers a range of products, including a UVC light-based sterilization device, a phototherapy device, and an infant radiant warmer. During the pandemic, Simbona was able to benefit from a government policy to encourage local manufacturing of medtech. Established in 2016, Simbona addresses the government's top health priorities by creating low-cost, life-saving medical technologies.

Gabriel Bruwer is the Design and Development Manager at Sinapi Biomedical, a South African company specializing in the design and manufacture of disposable medical devices. Mr. Bruwer shared the journey of Sinapi, which has products in chest drainage, obstetrics, specimen collection, and nutrition. Sinapi works with

clinicians, engineers, and others to develop their medical devices. They partner with many global entities such as Grand Challenges Canada, Northwestern University, Technology Innovation Agency, and many others. Sinapi has received funding from UKAid, Bill and Melinda Gates Foundation, and USAID. Mr. Bruwer highlighted expertise in plastics engineering as one of Sinapi's competitive advantages. He encouraged innovators to work with clinicians to understand clinical needs and develop solutions based on clearly identified needs.

Market Access

Ms. Khatuchi Khasandi (Rice360 Institute for Global Health Technologies) was joined by Ms. Nellyann Ndumi (VIA Global), Dr. Eric Mbuthia (Ilara Health) and Mr. Ali Khalid (Hatch Technologies) on a panel on Market access. The panel explored the different models for medtech distribution in Africa and assessed the supply and demand challenges experienced by the distributors and the strategies adapted to navigate them. The panel also highlighted the opportunities for future growth in medtech distribution and how companies can position themselves for such changes.

Ali Khalid, the Director of Technology at Hatch Technologies, shared the organization's impact-oriented model, with a specific focus on maternal and newborn care. Unfortunately, newborn care is not as commercially viable as other devices but tends to be highly impactful. Hatch Technologies has emphasized data-driven decision-making, closely tracking device usage from sourcing to installation and usage in public hospitals. This data is reported back to the manufacturers to help improve the impact of the devices. Hatch Technologies also uses educational programs that stimulate demand for NEST360 devices. Collaboration with governments also ensures the sustainable distribution of NEST360 devices in healthcare facilities.

Nellyanne Ndumi, the Seller Experience Manager at Via Global Health, talked about their commercially oriented approach. Via Global Health focuses on verifying, sourcing, and shipping medical devices primarily to NGOs. Challenges discussed included the new value-added tax in Kenya and their impact on medtech costs. The post-COVID era also led to shifts in demand, notably transitioning from Chinese products to products from other markets. Via Global Health conducts educational programs, including webinars, to raise awareness about specific devices. A recent webinar prioritized a device that aids in blood recycling. Their future plans involve expanding into the innovation space and distributing off-grid solutions, such as the Vayu Bubble CPAP, in resource-constrained markets.

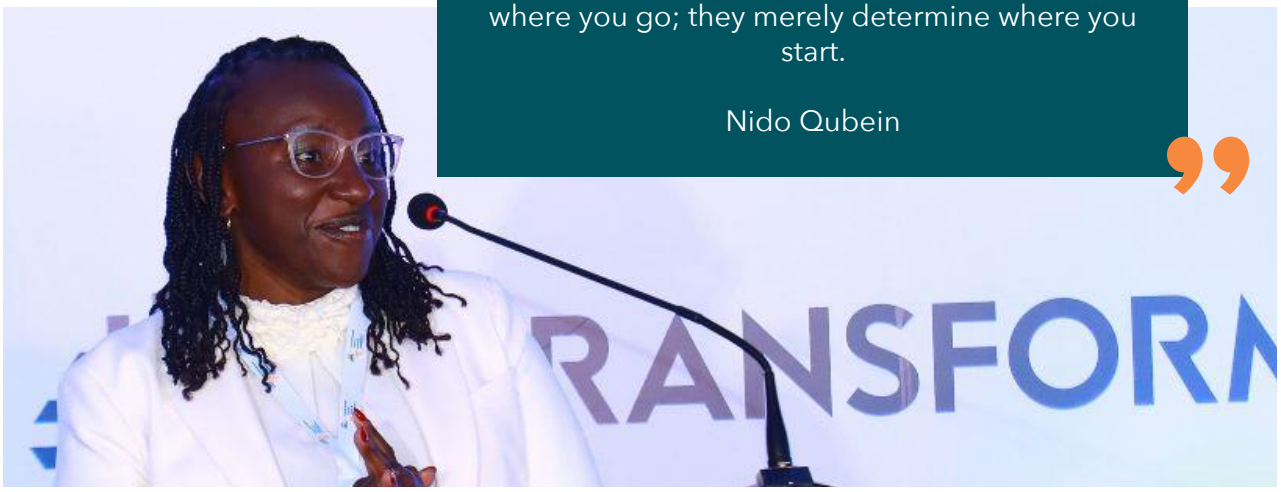
Dr. Eric Mbuthia, the Chief Medical Officer at Ilara Health, highlighted their SME-focused approach, operating at the intersection of commercial and impact goals. Their target profile consists of small rural clinics. Notably, they have diversified their value offering to include equipment purchase financing and have expanded into homecare devices. They have observed a growing demand for smaller devices, which is attributed to space limitations in their clients' facilities.

Closing Remarks by Prof. Maina Mwangi, Director of Incubation, Innovation, and Industry Linkages at Kenyatta University

Prof. Maina Mwangi commented that discussions from the first day emphasized the need to narrow the gap between industry and academia in order to accelerate medtech commercialization. He reflected on the need for universities to sign broad MOUs with agile and innovative companies to extend collaboration instead of working on singular issues.

He thanked all the panelists for sharing their knowledge and expertise and commented on how engaging all the sessions had been; underscored by a full room at almost 6pm!

Day 1 was brought to a close by Master of Ceremonies Ms. Watau Gaita with the following quote:



> Your present circumstances don't determine where you go; they merely determine where you start.
>
> Nido Qubein


Villgro
africa
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Ventu
RICE
Institute of Global Health
Ifako
Beyond creativity

DAY 2

Rice360 Institute for Global Health Technologies & Kenyatta University Academia – Industry Breakfast Workshop

Rice360 and Kenyatta University hosted a workshop that convened 31 stakeholders with the goal of documenting the opportunities and challenges for universities to engage with the innovation ecosystem in Kenya.

Ms. Will Moyo moderated a panel with Dr. Data Santorino of CAMtech Uganda and Mr. Jean de Dieu Oemba Sibomana of the University of Global Health Equity. They discussed the strategies they use in their academic institutions to engage and sustain industry partnerships.

Dr. Santorino highlighted the importance of a structured intellectual property policy that safeguards the rights and interests of individuals and organizations while fostering successful collaborations and partnerships within industry. He highlighted that, in his experience, industry partners are interested in engaging once there is a product. However, there are a few opportunities to meet objectives by engaging student teams guided by faculty mentors. This approach allows students to gain valuable practical experience and exposure to industry challenges, enhancing their readiness for the workforce.

Mr. Sibomana emphasized that academia-industry partnerships are an important part of student training. He talked about the importance of aligning objectives and expectations as well as goals and timelines. Regular communication and feedback mechanisms must be in place to ensure both parties stay on track and adapt to evolving needs. Mr. Sibomana stressed that it is important to consider the distinct cultures and priorities. Academia typically values open sharing of knowledge, academic freedom, and long-term research pursuits, while industry prioritizes profitability, efficiency, and shorter-term goals. By acknowledging and addressing these cultural disparities, organizations can harness the unique strengths of both sectors, leading to more fruitful and sustainable partnerships.

The panel was followed by a workshop where partners identified the following opportunities for academia-industry partnerships:

- **Providing employable talent for the innovation ecosystem.** Employability can be enhanced by combining technical and soft skills. This can be acquired through industry immersion project-based learning opportunities.
- **Offering a pipeline of student and faculty innovations.** Universities have the technical resources to work at the early stages of technology development before connecting their innovators with industry partners who can help commercialize MVPs.
- **Leveraging industry engagements to learn how universities can engage better with industry.** A participant reported that followed their institution's interaction with an established global corporation was developed into the following three-step checklist:

  - Does the team constitute content experts in the field they are innovating in?
  - What is the size of the total addressable market? Is your IP coverage extensive?
  - Can the bill of materials used in prototype development translate to a profitable product?
- Universities could establish multi-stakeholder advisory boards to enable them to successfully navigate the innovation ecosystem.

Participants reported that successful university-innovation ecosystem partnerships occur when:

- Collaborative projects between these stakeholder groups progress beyond the short term to long-term partnerships.
- Collaborative projects result in broader outcomes beyond the outputs of the partnerships, such as social impact.

The collaboration enhances the capacity of both partners, leaving them better equipped for such future engagements.

Startup Pitch Session

The startup pitch session invited leading African startups in medtech to share their innovations and business models with the diverse stakeholders of the African medtech landscape. The StartUp Pitch Session was an opportunity to pitch to investors and other stakeholders. The judging panel included Wilfred Njagi (Villgro Africa), Arnold Mwangi (DOB Equity), Sewu-Steve Tawia (Jaza Rift Ventures), Dr. Emma Waiyaya (Beyond Elephant Advisory), and Astuti Sharma (Ascent Capital).

Award	Winner
Impact Award $3000	Maziwa
Monitoring and Hardware Devices Award $3000	GICMED
Non-surgical and Medical Equipment Award $4000	Simbona Africa Healthcare
Assistive Devices Award $5000	A-Lite Uganda
Most Promising Award $10000	Drop Access

Profiles of all the startups that pitched during this session are included in Appendix B.

Patient Story by Dr. Mary Waiyego, Kenyatta National Hospital

Dr. Mary Waiyego, a neonatologist at Kenyatta National Hospital, shared a patient story in which she highlighted the challenges that result from working with limited access to medical technologies. She shared that because of the shortage of devices, they have to be creative and come up with solutions. A lack of proper equipment can lead to poor health outcomes.

She shared a story about a young mother with a premature baby. No ultrasound was performed during her pregnancy, so it was unclear how premature the baby was at birth. Additionally, transport incubators were unavailable, making it challenging to keep the baby warm.

Most equipment currently available has not yet been validated for newborn babies, hence it takes longer than needed to make critical decisions for treatment and patient management. Simple supplies like nasal prongs to administer oxygen were unavailable for the 900-gram baby. Administering a drip was also challenging as the equipment could not meter the small quantities needed. Despite these obstacles, the baby survived but will likely face challenges such as retinopathy of maturity which could not be screened for due to lack of equipment.

Dr. Waiyego's presentation served as a powerful testament to the unwavering commitment of healthcare practitioners in resource-constrained settings. It underscored the urgent need for collective efforts to address these challenges and ensure that every patient, regardless of their circumstances, has access to the life-saving medical technologies they deserve. Her story resonated deeply with the audience, leaving a lasting impression and a call to action for improved healthcare access and equity.

Guest of Honour and Keynote Speaker

Prof. Ndirangu Kioni, Ag. Head, Research-Innovation Ecosystems and Entrepreneurship Education Office, Dedan Kimathi University of Technology (DeKUT)

Prof Ndirangu Kioni, former DeKUT vice-chancellor, gave a keynote address titled **"How Can We Accelerate MedTech Innovations and Products Across the African Continent?"** In his address, Professor Kioni highlighted how DeKUT has been able to successfully form and sustain industry partnerships. He used the semiconductor manufacturing facility as a case study, outlining how collaboration between academic expertise and industry acumen can lead to transformation. The university's strategic alliances with industry stakeholders are contributing not only to its own growth and evolution but also to the broader advancement of technology and the enhancement of educational and economic landscapes.

Professor Kioni highlighted that education needs to be tightly linked to the purpose of transforming society. It is not just about educating people but doing so in a way that actually instigates change.

When it comes to manufacturing, mapping out our current position is important. He echoed the frustrations shared by Prof. Wainaina regarding getting innovations from academia into the market. In particular, he mentioned innovations developed during the COVID-19 pandemic that never made it to market.

He spoke about South Korea, which is a small country with a large GDP. The history behind their success started in 1963 when they developed certain sectors and identified champions to play a leading role in the transformation. He asked who will be the leading champions in the biomedical devices sector in Africa so that the rest can rally around them.

Prof. Kioni mentioned that biomedical equipment has not featured in the Kenya government agenda and that to be successful, lobbying would be needed. Additionally, industrial design needs to be included in the engineering programs to help the engineers design devices that are aesthetically pleasing. Specialized training centers need to be established to assist in training the engineers in areas that are not in the mainstream course but are key in developing the needed skill sets. These could include:

- Nano fabrication
- Micro fabrication
- Precision engineering
- Special sensor design

If people agree to work together, then the majority of the challenges Africa faces can be solved.

MedTech Innovation Ecosystem Stories

Ms. Will Moyo convened Mr. Masoud Mnonji of PDP Consortium, Mr. Bernard Chiira of Innovate Now, Eng. Elizabeth Asma of NEST360, and Dr. Gerard Rushingabigwi of EA Biodesign, University of Rwanda College of Science & Technology. The panel shared the work of their organizations and provided key insights and lessons over the years.

Mr. Masoud Mnonji, director at Ifakara Innovation Hub and Manager of the PDP Consortium talked about nurturing the growth of entrepreneurship and a sustainable medtech ecosystem in Tanzania. This is being accomplished by offering support and empowerment to young innovators and entrepreneurs, enabling them to develop solutions for significant societal issues and transforming these ideas into marketable products. The vision for the hub is to ultimately spur economic growth and create valuable employment prospects.

Using collaborative product development partnerships to increase access to infrastructure, technical capabilities, and access to funds, the PDP Consortium is supporting medtech startups who are developing a baby warmer, Bubble CPAP, pre-eclampsia rapid test kit, dental crowns, and a body lifting device.

Mr. Bernard Chiira, the Co-Founder & Director, Innovate Now, Africa's first assistive technology accelerator, used his personal story to highlight the importance of assistive technologies. As a newborn, Bernard was diagnosed with

brittle bone disease and his family moved closer to the city to access better healthcare. He opened a window into his life's experiences, offering a powerful glimpse into the challenges and triumphs he faced while growing up with a disability. He articulated how the disability had presented him with numerous hurdles and obstacles from a young age. He spoke of the moments of frustration and the painstaking efforts required to navigate daily life. From basic mobility to accessing education and pursuing his passions, he confronted and overcame numerous challenges.

Bernard highlighted the transformative role that assistive technologies play in the lives of individuals with disabilities. Adaptive devices, mobility aids, or therapeutic technologies can improve lives. Bernard's narrative reminded delegates of the vital role that assistive technologies play in fostering inclusivity and enabling individuals with disabilities to lead fulfilling lives. His story showed a path forward toward a more inclusive and accessible world, where technology empowers individuals to overcome adversity and pursue their dreams.

Eng. Elizabeth Asma, Nest 360 Director of Technology Development, shared insights on scaling a package of newborn essential solutions and technologies. Eng. Asma highlighted the importance of developing a rigorous evaluation process and including a multidisciplinary set of stakeholders worldwide. NEST360 works in the USA, Malawi, Nigeria, Tanzania, and Kenya and supports governments in implementing a package of care that allows them to deliver high quality neonatal care. NEST360 identifies a medical device need, defines a target product profile, identifies and evaluates candidate technologies, conducts technical and environmental testing, evaluates usability, and then provides qualification.

NEST360 proposed a set of performance and operational characteristics across six pathways of care:

1. Hydration, nutrition, and drug delivery
2. Jaundice management
3. Point-of-care diagnostics
4. Infection prevention and control
5. Thermal management
6. Respiratory support

NEST360 has developed detailed testing protocols for all product categories. The environmental testing protocols look for device performance in high temperatures, high humidity, dust exposure, voltage fluctuations, and power failure.

Dr. Gerard Rushingabigwi of East Africa Biodesign and lecturer University of Rwanda College of Science & Technology presented the EA Biodesign program vision to improve health equity in Africa by training local innovators in a process to develop acceptable, accessible, and sustainable health-technology innovations. The program will do this by:

1. Teaching a repeatable, rigorous process for need-driven health technology innovation.
2. Training fellows to appreciate the dynamics of healthcare and health technology industry in East Africa.

3. Preparing fellows for leadership roles in health technology innovation.
4. Equipping fellows to work effectively on multidisciplinary teams.
5. Providing access to a valuable network of contacts and mentors.

Regulatory & Policy Landscape

Dr. Robert Karanja was joined by Ms. Grace Baloyi of the South African Medical Research Council and Dr. Lutchmee Nobaub, CEO of Clinear Research, to discuss regulations and policy in medtech.

Ms. Grace Baloyi highlighted enabling policies and their implementation in South Africa. She discussed initiatives that South Africa is leading to support the development of medical technologies. Ms. Baloyi's presentation showed the pivotal role that government investment plays in the growth and evolution of the medical technologies sector. She said that by allocating resources and crafting conducive policies, governments can not only set the overarching priorities but also provide a solid foundation upon which industry can thrive. Her presentation outlined how government initiatives serve as guideposts, directing the industry's efforts towards addressing pressing healthcare challenges and creating solutions that resonate with the needs of the population. This interconnectedness can propel the medical technologies sector forward, leading to advancements that benefit society.

Dr. Lutchmee Nobaub, CEO of Clinear Research, led a discussion on the conformité européenne (CE) mark certification and provided insights for clinical trials. The CE mark signifies that a technology has been assessed for safety and effectiveness by the European Economic Area (EEA). She also mentioned that there are different methods used in classifying medical devices based on the level of invasiveness. The methodology of classifying medical devices varies based on the type of certification. The US Food and Drug Administration (US FDA) and CE have different ways of certifying.

She explained how clinical trials are invaluable for critical considerations that extend far beyond the binary realm of safety and effectiveness. Dr. Nobaub outlined how trials provide insights into the long-term impacts, potential side effects, and real-world practicality of medical innovations. Moreover, she underscored their vital role in fostering a robust understanding of the patient experience, shedding light on factors such as quality of life, comfort, and user experience.

Agenda/Vision Setting Workshops: Fostering Partnerships to Accelerate MedTech Commercialization in Africa

Delegates participated in breakout sessions aligned with their expertise and interests. These sessions covered a range of topics, including industry-academia collaboration, manufacturing, investment strategies, market pathways, and regulatory and policy considerations. Within each session, attendees actively identified crucial issues which will be used to define an action agenda for the coming year.

1. Industry-Academia

Moderators: Ms. Khatuchi Khasandi & Dr. June Madete

During the Transforming Africa MedTech Conference, industry and academia came together to discuss the strategy for launching the Graduate Medical Innovation Graduate Program. This was an opportunity to highlight assumptions, expected outcomes, and benefits for industry stemming from this initiative. Attendees were able to offer thoughtful feedback on the program and how the ecosystem can be engaged for the benefit of graduate students.

In 2024, Kenyatta University is set to unveil the Global Medical Innovation (GMI) course, drawing inspiration from the renowned program at Rice University. At the Transforming Africa MedTech Conference, key stakeholders from both the innovation ecosystem and universities were invited to localize GMI to the Kenyan context.

To start off, a strengths, weaknesses, opportunities, and threats (SWOT) analysis was conducted to identify the competitive advantage of GMI in the Kenya market. This was followed by an examination of the critical assumptions of the program and finally a review of what success for GMI in Kenya will look like.

SWOT ANALYSIS OF THE GMI PROGRAM IN KENYA	
Strengths	**Weaknesses**
• Students have access to a globally competitive program locally. • Students can build connections with reputable industry stakeholders. • The program integrates diverse disciplines, hence fostering comprehensive innovation. • The program fosters ideas specifically designed to tackle local challenges. • The program capitalizes on pre-existing expertise to facilitate a more expedited learning process for professionals.	• The presence of a heterogeneous student population requires an administrative structure that promotes cross-disciplinary collaboration to effectively address the vast range of learning requirements and backgrounds.
Opportunities	**Threats**
• Building a comprehensive administrative framework to effectively manage the activities of the program. • Incorporating criteria, such as the completion of a minimum viable product, to enhance the experience of the students.	• High tuition costs in the absence of commensurate perceived value has the potential to discourage prospective participants. • Expanding the program from a private university in a high-income country to a public university in an emerging market.

• Integrating modules that are readily available and distributing them across the academic calendar to accommodate professionals. • Conducting periodic feedback meetings between university stakeholders and industry representatives to ensure the program responds to the evolving industry needs. • Considering piloting some version of the program to make required improvements to boost its overall success.	• Any ambiguities in the qualifying criteria have the potential to diminish the distinctive value proposition of the program. • The presence of similar programs at Kenyatta University, such as the Stanford University Biodesign program set to launch at KU in 2024.

Critical assumptions of the program: The efficacy of the GMI course is contingent upon the following fundamental assumptions:

- Students will have access to cutting-edge labs and technology infrastructure.
- Kenyatta University has the infrastructure to market, implement, and sustain the demand of the program.
- There exists a well-defined and structured plan for certification and accreditation, which serves to establish the program's legitimacy and attain acceptance.
- The program will deliver the global level quality at a local price point.
- The local manufacturers and industry partners will sustainably partner with Kenyatta University to implement GMI activities.

Vision of a Successful GMI: A successful GMI program would be characterized by sustained interest from both students and the industry. Key indicators of its success would include:

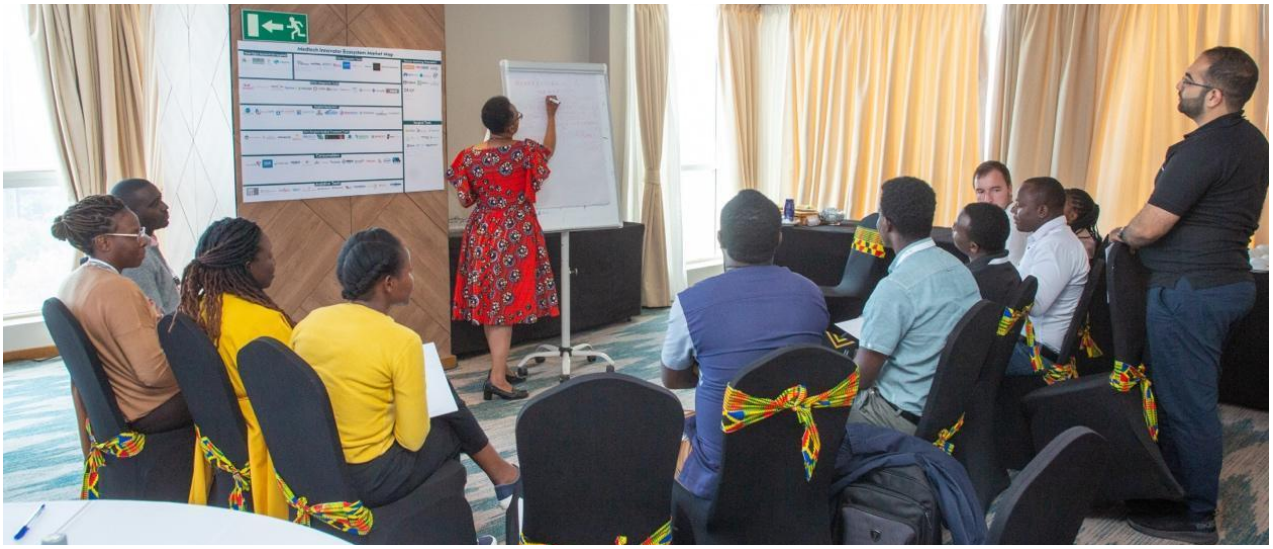
- A track record of medtech products, devices, and commercialized patents developed by the GMI alumni. A rich portfolio of medtech devices and genuine user testimonials.
- Graduates of the programs should emerge as industry leaders, equipped with high-level skills.
- Attract both national and international scholarships, further cementing its position as a beacon of innovation and academic excellence.

In conclusion, the categorization of the GMI program, whether it is designated as a Professional Course, an Engineering Masters, a Fellowship, or a Minor Degree, will significantly influence both its attractiveness in the Kenyan market and its level of academic rigor. Prior to deciding on the category, it is necessary to examine the following factors:

- The output of the program, such as joint certification by both Kenyatta and Rice University, MVP, seed grant, internship opportunities with global medtech companies.
- The program's core target group, which encompasses new innovators, recent undergraduate and/or postgraduates, and seasoned professionals, requires a precise and well-defined characterization.
- The specific skills the program intends to teach and the expected time frame for achieving proficiency in each skill. This is important to ensure that participants are well equipped to tackle the obstacles they may encounter in the sector.
- The program's duration should be tailored to strike a balance between academic quality and practicality, taking into consideration its target audience of working professionals.

2. Manufacturing-Innovation

Moderators: Eng. Wambui Nyabero, Eng. Shaukatali Hussein & Eng. Paul Nyaki



Areas to consider when manufacturing medical devices:

1. Manufacturing capacity
   - Training of manufacturers
   - Shared resources among startups
   - Apprenticeship: Work with apprentices in the industry, sourced from technical colleges, or hire people with fewer skills but who are coachable
   - Utilize existing facilities to help in manufacturing (e.g., UIRI)

2. Leverage AFCTA for tax purposes.
3. Academia
   - Collaborate with universities in curriculum development. Innovators to find ways to help change the mindset of universities
   - Encourage students to have industry experience (field work) while still in school
   - Have industry consultants in technical training institutes (TVETs)
   - Innovators could consider patent/IP sharing with universities

4. Resources and skills mapping
   - Leverage R&D institutes
   - Consider the cost implications for prototyping and low volume manufacturing (3D printing, vacuum casting, etc)

5. Infrastructure
   - Seek alternative sources of power (e.g., solar, batteries) if electricity is unstable in your region
   - Participate in government lobbying to help improve infrastructure
   - Software: Consider joining consortium for license sharing purposes (there are free versions however they have limited features)

6. Financing
   - Seek loans from banks which ask for collateral
   - Consider costs for certification/validation of ISOs
   - Some companies offer financial support for manufacturing as CSR

7. Regulatory & Compliance
   - Invest and budget for ISOs
   - Consider whether in-house or outsourced manufacturing is needed

8. Supply chain
   - Availability of raw materials and where to source them
   - In-house or local production
   - Mapping what can be made locally and what needs to be imported

Areas to consider when innovating:

1. Design your product specifically for your target market
2. Design a product that can be manufactured
3. Continuous R&D
4. Seek incubation opportunities
5. Hire people with the right skills and background; diversify your team
6. Consult experts in the field

3. Market Access

Moderators: Mr. Moses Waweru and Nellyann Ndumi

In the context of market access, the challenges faced when introducing medical products into the market were analyzed by the participants. They outlined several key issues:

1. Government bureaucracy and changing policies: The ever-shifting landscape of government regulations and bureaucracy posed a significant hurdle.
2. Information asymmetry and access to information: Limited access to crucial information such as market size and regulatory requirements created uncertainties.
3. Personal interests and mindset: The influence of personal opinions, both among patients and healthcare professionals, had an impact on market entry.
4. Competition: The comparison of products to those from more established markets like the USA or UK presented a challenge.
5. Barriers to entry: Demands for product adaptation and documentation, as well as questions about who was already using the product and in which countries, hindered market entry. Regulatory input from the government was deemed necessary to address these concerns.

In response to these challenges, the participants brainstormed potential solutions: Community Sensitization: Building credibility for local brands and public education efforts at the government level to raise awareness.

1. Product Publicity: Aggressively promoting products and sharing success stories to boost their image.
2. Knowledge Transfer: Demonstrating alternative business approaches to the government to foster innovation and adaptation.
3. Creating Forums for Innovation Regulation: Establishing platforms to drive innovation in regulation.
4. Government Support for Local Products: Advocating for import protection and the promotion of domestically produced goods, taking inspiration from the Ethiopian model.

To bridge the gaps and find effective solutions, partnerships were identified as crucial:

1. International Partners: Collaborating with international organizations like AMREF to provide advisory support and brokerage services.
2. Storytelling Partners: Partners who can help craft and communicate compelling narratives.
3. Information Repositories: Leveraging existing data sources such as Kenya's demographic and household utilization surveys.
4. Academia Collaborations: Establishing centralized repositories for essential information through collaborations with academic institutions.
5. Digital Service Providers: Engaging with digital service providers like Ilara, which have access to valuable data and can assist in making informed investment decisions and shaping government policies.
6. Government Policy Advocacy: Advocating for favorable policies by directly engaging with government officials and seeking approvals for imports when necessary.

These comprehensive strategies and partnerships aimed to tackle the multifaceted challenges of gaining market access for medical products effectively.

4. Regulatory and Policy

Moderator: Dr. Robert Karanja and Dr. Grace Baloyi

In the realm of regulatory and policy, the discussions unfolded with a focus on leveraging the insights shared by Grace Baloyi from South Africa and the initiatives of MeDDIC. Grace, in her presentation, delved into the cluster model employed by MeDDIC and their extensive work within the South African context.

During her presentation, she shed light on the concerted efforts made to foster a harmonious regulatory ecosystem in South Africa. MeDDIC's collaboration with seven innovation entities took center stage in her narrative.

Grace emphasized the necessity of establishing independent, neutral, and multidisciplinary entities capable of spearheading discussions aimed at unification and the promotion of collaboration among various stakeholders.

Another pivotal point underscored was the concept of capitalizing on industries that had already made significant strides. The case in point was the success story of AgriTech in South Africa.

Subsequently, the conversation broadened its scope. It centered on devising a strategic agenda to revamp the African medtech industry and nurture a knowledge-based economy. Valuable lessons were shared, drawing from experiences in Tanzania, Uganda, and Kenya. The team collectively acknowledged the prevalent disintegration and duplication issues, recognizing the urgent need for collaborative efforts and the utilization of existing platforms.

As the dialogue progressed, several approaches were devised. It was unanimously agreed that there was indeed a demand for regulatory standards. What was crucial, however, was the demonstration, articulation, and dissemination of this demand to the authorities vested with the mandate.

Furthermore, the participants stressed the importance of establishing a formal entity to serve as a conduit for communication and advocacy. They also discussed the necessity of forging memoranda of understanding (MOUs) with relevant entities and organizations to create a more robust platform.

In pursuit of a dynamic approach tailored to local contexts, a “pull and push” strategy was advocated. This approach aimed to integrate the best practices in regulatory standards and involved a case study on clinical validation in Uganda, with detailed insights from the BME group at Makerere University.

The discourse culminated in a discussion on the potential of leveraging Pan-African platforms such as the African Medicines Agency (AMA) and the African Medical Devices Forum (AMDF) to develop harmonized guidelines for regulation and Good Manufacturing Practices (GMP) certification across the continent.

Closing Ceremony & Award Presentations

Prof. Kioni and Dr. Victor Konde presented awards to the winners of the Start Up Pitch Session.

Wilfred Njagi, Villgro Africa CEO, concluded the conference with a call to action for delegates to ensure that the conversations started on this occasion did not end there. He implored the delegates to continue these vital conversations and, more importantly, to translate them into concrete actions, fostering an environment where the medtech industry would be able to flourish and thrive.

APPENDICES

Appendix A: Conference Agenda

Day 1 Aug 24th 2023

7:00 - 8:45 **Breakfast & Vision Setting Workshop (Invitation Only)**
Floor 3, Mara Room

8:00 - 9:00 **Registration & Name Tag Pickup**
Collect your attendee packet

9:00-9:10 **Welcome Remarks**
Eng. Wambui Gachiengo Nyabero Villgro Africa & Ms. Khatuchi Khasandi, Rice 360
Floor 14

9:10 - 9:20 **Patient Story I**
Dr. Moses Ochora , Photokabada
Floor 14

9:20 - 9:30 **Remarks by Chief Guest**
Vice Chancellor of Kenyatta University
Prof. Paul K. Wainaina
Floor 14

9:30 - 9:50 **Opening Keynote**
The Transformative Potential of a Robust African Medtech Industry
Dr. Victor Konde
Scientific Affairs Officer, UN Economic Commission for Africa (UNECA)
Floor 14

9:50 - 10:15 **Coffee Break & Networking**
Press Conference
Floor 3, Mara Room

10:15 -11:15 **Medtech Ecosystem Landscape & Discussion**
Moderator: *Eng. Wambui Nyabero (Villgro Africa)*
Panelists: *Phoebe Khagame (Oxygen Alliance), Dr. Kamau Gachigi (Gearbox Kenya), Wilfred Njagi (Villgro Africa)*
Floor 14

11:15-12:15 **Panel: What Does African-Centred Medtech Look Like?**
Moderator: *Dr. June Madete (Kenyatta University)*
Panelists: *Daniel Atwine (SOAR Research Foundation), Dr. Muhammad A. Rushdi (Cairo University and New Glza University), Dr. Data Santorino (CAMTech)*
Floor 14

12:15-1:15 **Panel: Financial Sustainability in Medtech**
Moderator: *Sewu-Steve Tawia (Jaza Rift Ventures)*
Panelists: *Arnold Mwangi (DOB Equity), Dr. Emma Waiyaiya (Beyond Elephant Advisory), Bernard Chiira (Innovate Now/AT Ventures)*
Floor 14

1:15-2:30 **Lunch**
Floor 3

2:30-3:30 **Local Manufacturing Capacity**
Moderator: *Dr. Kamau Gachigi (Gearbox)*
Panelists: *Roneek Vora (Revital Healthcare), Eng. Gabriel Bruwer (Sinapi Biomedical), Eng. Habtamu Abofoge (Simbona)*
Floor 14

3:30-4:30 **Panel: Market Access**
Moderator: *Khatuchi Kasandi (Rice360)*
Panelists: *Dr. Erick Mbuthia (Ilara Health), NellyAnne Ndumi (VIA Global), Eng. Ali Khalid (Hatch Technologies)*
Floor 14

4:30 - 5:00 **Closing Remarks**
Prof. Maina Mwangi (Director of Incubation, Innovation, and Industry Linkages, Kenyatta University)
Floor 14

5:00-6:30 **Networking Mixer**

Day 2 Aug 24th 2023

7:00-10:00 **Rice360/KU Academia/Industry Breakfast Workshop (Invite Only)**
Moderators: *Khatuchi Khasandi (Rice360), Dr. June Madete (Kenyatta University)*
Floor 3, Mara Room

7:00-7:45 **Judges Breakfast and Briefing Session**
Floor 3

8:00-10:00 **Startup Pitch Session**
Judging Panel: *Wilfred Njagi (Villgro Africa), Arnold Mwangi (DOB Equity), Sewu-Steve Tawia (Jaza Rift Ventures), Dr. Emma Waiyaya (Beyond Elephant Advisory) Astuti Sharma (Ascent Capital)*
Floor 14

10:00-10:30 **Coffee Break & Networking**
Floor 14

10:30-10:50 **Keynote Speech**
How Can We Accelerate Medtech Innovations and Products Across the African Continent?
Prof. Ndirangu Kioni (Ag. Head, Research-Innovation Ecosystems and Entrepreneurship Education Office, Dedan Kimathi University of Technology)
Floor 14

10:50-11:05 **Patient Story**
Dr. Mary Waiyego (Neonatologist at Kenyatta National Hospital)
Floor 14

11:05-12:15 **Medtech Innovation Ecosystem Stories**
Moderator: *Will Moyo*
1. Masoud Mnonji (PDP Consortium)
2. Dr. Gerard Rushingabigwi (EA Biodesign; University of Rwanda College of Science & Technology)
3. Bernard Chiira (Innovate Now)
4. Elizabeth Asma (Nest 360)
Floor 14

12:15-1:15 **Regulatory & Policy Landscape**
Moderator: *Dr. Robert Karanja (Villgro Africa)*
Panelists: *Dr. David Karenye (MEDAK), Dr. Lutchmee Nobaub (Clinear Research) GraceBaloyi (South African Medical Research Council)*
Floor 14

1:15-2:15 **Lunch**
Floor 3

2:15-3:30 **Agenda/Vision Setting Workshop: Fostering Partnerships to Accelerate Medtech Commercialisation in Africa**
Breakout Rooms:

1. Industry/Academia – Floor 3, Mara Room
Moderators: *Khatuchi Khasandi & Dr. June Madete*

2. Manufacturing/Innovation – Floor 14
Moderators: *Eng. Wambui Nyabero, Eng. Shaukatali Hussein & Eng. Paul Nyaki*

3. Investment Community – Floor 14
Moderators: *Sewu-Steve Tawia & Wilfred Njagi*

4. Market Access – Floor 14
Moderators: Moses Waweru & NellyAnne Ndumi

5. Regulatory and Policy – Floor 14
Moderator: Dr. Robert Karanja

4:00 -5:00 **Closing Plenary**
Report on Partnerships Agenda
Floor 14

5:00-5:30 **Closing and Awards Ceremony**
Closing Remarks & Vote of Thanks: *Wilfred Njagi*
Startup Awards
Floor 14

5:30-7:00 **Networking Reception**
Floor 14

Appendix B: Start Up Profiles

A-Lite

A-Lite Uganda Limited (Hereafter, A-Lite Uganda) is a Ugandan-based medical device company focused on improving the lives of people at the base of the pyramid. The company's flagship product, the A-Lite vein locator, provides easy access to patients' veins and alleviates the clinicians' work burden.

The A-Lite vein locator is a non-invasive, lightweight medical device that illuminates blood vessels to enhance vein visibility so that clinicians can insert cannulas.

The A-Lite vein locator provides easy access to patient veins and reduces the number of attempts and duration needed to obtain venous access in difficult cases. Reducing the number of unsuccessful needle stick attempts leads to a reduction in tissue trauma, reduces costs that arise from failed attempts (such as materials, staff time, and delays in treatment) and results in better clinical outcomes and increased patient satisfaction. The A-Lite vein locator is operated by one nurse or clinician, which puts into consideration the high ratio of doctors to patients, 1:25,000 among health facilities in low- and middle-income countries. The device is solar powered, and it comes with a rechargeable battery with a life long enough to allow operation for up to eight hours.

Simbona

Simbona Africa is an Ethiopian medical device company that produces UVC light-based apparatus used to prevent the spread of COVID-19 and hospital acquired infections by reducing transmission through contaminated objects and surfaces. There are two versions: (1) a room sterilizer designed to decontaminate high risk open spaces such as hospital wards, theaters, and corridors, and (2) a UVC cabinet designed to decontaminate objects such as masks and other PPEs used by health workers. Simbona is also working to produce a locally designed and manufactured baby warmer to treat jaundice in newborns.

The COVID-19 virus can survive for between two hours to nine days on surfaces depending on the type of surface, but studies show that 99.9% of coronaviruses are killed when exposed to UVC light. UVC apparatus have utility beyond the COVID-19 pandemic as well. Hospital acquired infections (HAI's) affect 4% of hospitalized patients and are linked to community transmission of multidrug resistant infections.

Simbona UVC tech provides an easy, cost-effective approach for COVID-19 infection risk reduction and protection of frontline workers by eliminating viruses on objects, surfaces, enclosed and open spaces. Local manufacturing of these devices also helps to address the critical shortage of foreign exchange faced by Ethiopia.

Med Box

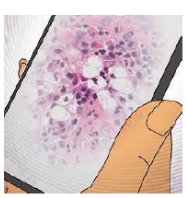
MEDBOX represents an advanced healthcare monitoring system designed to capture a patient's essential health indicators and promptly transmit this data to medical professionals or any healthcare expert. This process enables remote medical consultation. This system interfaces with a software solution known as MED-BOX 2.0, which displays real-time readings from each patient affiliated with the healthcare facility. Furthermore, MED-BOX 2.0 maintains a comprehensive record of medication history for every patient. Additionally, MED-BOX includes a designated compartment for storing medications, along with an audio alerting mechanism that issues alerts to patients in their local languages and through SMS notifications, ensuring timely and accurate medication adherence. We are also actively exploring the integration of a blood pressure measurement component into MED-BOX, enabling patients to remotely record and monitor their blood pressure readings.

MEDBOX embodies a holistic medical resolution, featuring cutting-edge hardware and software elements, accompanied by a user-friendly mobile application. This amalgamated system empowers pharmacies to efficiently gather and oversee crucial health metrics for individuals grappling with chronic and diabetic conditions, whether they are physically present or located remotely. By streamlining these processes, MEDBOX significantly elevates the quality of the pharmacy-patient healthcare journey, resulting in an impressive 70% augmentation in the efficiency of healthcare provision.

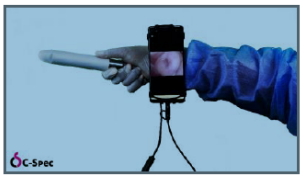
GIC Space

...remote screening and diagnosis at the point of care!

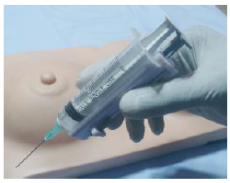
5 Technologies:



Digital microscopy system



Smart speculum



Fine needle biopsy device

Telemedicine platform

Gamified e-training platform

The Global Innovation and Creative Space (GIC Space) is dedicated to ensuring equitable access to high-quality healthcare services by means of inventive and enduring medical technology solutions. GIC Space has introduced GICMED, a distinctive technological advancement capable of detecting, diagnosing, and treating cervical and breast cancers among women. This pioneering GICMED technology encompasses smartphone-based digital microscopy, colposcopy systems, and a telemedicine platform. Through comprehensive training of healthcare professionals in the use of GICMED, women residing even in the most secluded regions can now undergo cancer screening and diagnosis with the guidance of medical specialists at the point of care, thereby expanding access to treatment.

GICMED delivers state-of-the-art and economically viable medtech and telemedicine innovations, thereby affording impoverished, remote, and rural communities the opportunity to access affordable and convenient healthcare services that address their paramount needs. Functioning as a social enterprise, GIC Space's fundamental aim is to conceptualize, create, and advocate for economically viable and cutting-edge medical technology solutions tailored to the African context, with the goal of resolving critical health challenges prevalent in Sub-Saharan Africa.

They envision a global landscape where even the most susceptible individuals have the prospect of receiving standardized and indispensable healthcare, irrespective of their geographical location or societal status. Our mission is to develop inventive and enduring medtech solutions that pave the way for economically viable and high-quality healthcare delivery at the point of care.

Rology

Rology stands as the preeminent AI-assisted teleradiology platform in the Middle East and Africa. It is armed with an AI-enabled DICOM viewer and an efficient workflow management system. This platform seamlessly connects radiologists with cases from hospitals based on their availability and subspecialization, utilizing remote capabilities. Additionally, Rology elevates radiologists' efficiency and precision through AI-driven diagnostic tools. Commencing its journey in October 2017, Rology embarked on a mission to elevate diagnostic medicine and contribute to saving lives. The conviction underpinning Rology's efforts is that timely and accurate diagnoses are the cornerstone of effective treatment strategies.

Rology's impact extends to life-saving endeavors by offering a setup-free, end-to-end, integrated teleradiology solution to diagnostic imaging establishments across the MEA region, with a particular focus on underserved healthcare communities and geographically distant areas. The Rology platform ensures rapid delivery of diagnostic radiology reports to patients, especially in emergency situations, facilitated by a seamless workflow that pairs the most fitting subspecialized radiologist with each case prior to report generation. This process is then followed by a meticulous peer-to-peer review by our medical review and quality control team, spanning advanced scans. Rology's influence reaches even underserved communities, granting them access to sustainable, top-tier diagnostic imaging and radiology services, all at an exceptionally low setup cost, thus negating the need for in-house radiologist hires.

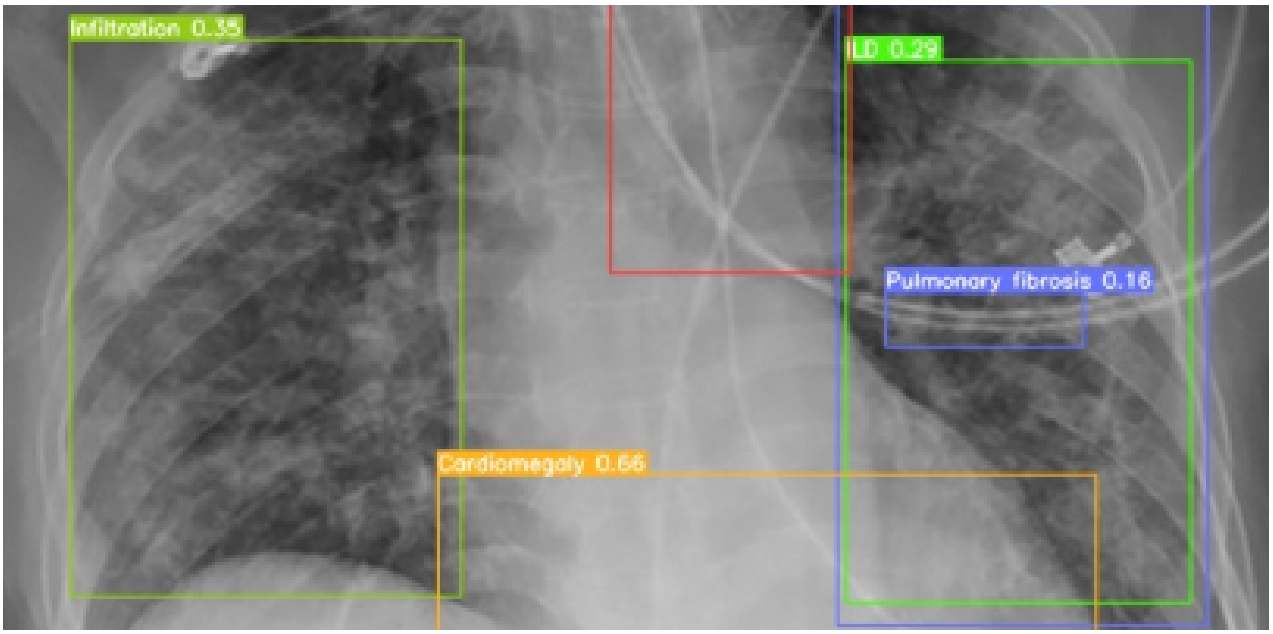
The platform serves to bridge the radiologist shortage gap while simultaneously facilitating access to precise diagnoses across numerous subspecialties. Rology effectively operates at the confluence of three rapidly expanding industries: (1) The Gig Economy, providing access to a vast pool of radiologists. (2) Teleradiology, enabling the uploading of images to the cloud for remote viewing by radiologists, effectively harmonizing supply and demand. (3) Data Intelligence, facilitating case matching, radiologist support, image annotation, and automated diagnostics.

Maziwa Pump

Maziwa emerges as the exclusive breast pump meticulously tailored to meet the needs of employed mothers within emerging markets. The establishment of Maziwa was spurred by the aspiration to kindle the potential of African mothers, allowing them to harmonize the health of their infants with the economic prosperity of their families. Our belief is firmly rooted in the notion that all mothers deserve the means to nurture their babies optimally, devoid of any compromises.

Drawing its name from the Swahili term for "milk," Maziwa unites three distinct entities—a pair of nonprofit organizations in Canada and the US, alongside a social enterprise in Kenya—under a shared mission. This mission revolves around equipping working mothers in developing nations with the tools to express breast milk and nourish their children. Each nonprofit entity is wholeheartedly dedicated to channeling 100% of its proceeds back into this noble cause, while the social enterprise commits the majority of its profits to ensuring the sustainable expansion of this mission.

Neural Labs



A pioneering medical technology firm is revolutionizing the realm of radiology by delivering real-time image analysis services to radiologists and medical institutions. This advanced system swiftly detects prevalent indicators of tuberculosis, pneumonia, and noteworthy cancers such as lung, breast, and prostate cancers. Operating from the Neural Labs Africa Innovation Hub, we harness the capabilities of Deep Learning and Computer Vision to effectively identify diseases in real-time.

Our proprietary AI algorithm, NeuralSight™, exhibits the proficiency to recognize more than 20 respiratory, cardiac, and breast pathologies, encompassing conditions like Pneumothorax, Cardiomegaly, Benign Breast Tumors, Malignant Breast Cancer, Atelectasis, Infiltration, Emphysema, Masses, Nodules, Pleural Thickening, Effusion, and Consolidation, all accomplished within real-time settings.

Neural Labs is fervently dedicated to leveraging the groundbreaking potential of AI to democratize access to diagnostic healthcare, consequently fostering a positive impact on the healthcare sector. Through AI screening, they aspire to elevate patient care standards.

Neural Labs has conceived a platform christened NeuralSight, aimed at alleviating Africa's disease burden while simultaneously lightening the load on medical facilities, all while enhancing patient outcomes and making healthcare more accessible to all.

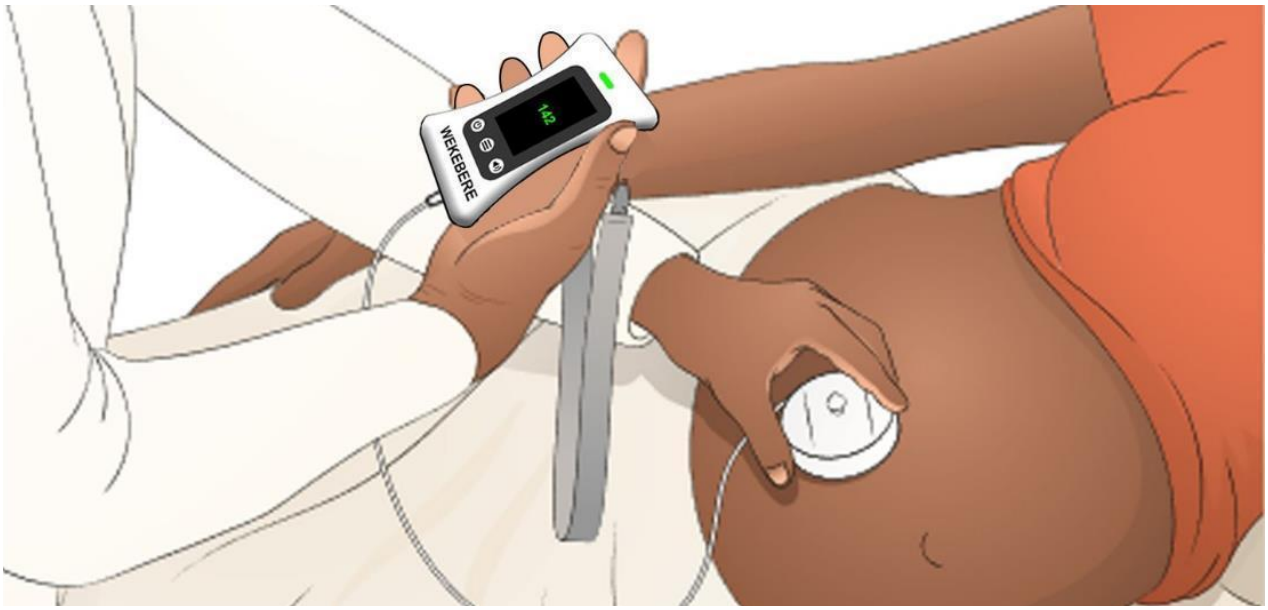
MamaOpe

MamaOpe is an AI health company that has designed a smart diagnostic aid to determine and interpret respiratory rate and lung sounds for the diagnosis of respiratory diseases. Lung sounds are detected using acoustic sensors placed over strategic lung fields.

Diagnosis of pneumonia remains a challenge due to clinical skills deficit among health workers. Determination and correct interpretation of pneumonia signs such as lung sounds, and respiratory rate (RR) are complicated with many inaccuracies experienced among health workers. This is mainly from incorrect counting of RR and failure to detect and interpret lung sounds, and this results in misdiagnosis, delayed access to treatment, and other complications including death.

MamaOpe's smart device accurately determines RR, detects and interprets lung sounds in combination with other clinically determined signs like temperature, heart rate, and chest in-drawing to improve the accuracy of pneumonia diagnosis. This complements health worker assessment skills, improves accuracy of pneumonia diagnosis, facilitates early treatment initiation, and informs the design of implementation programs aimed at reducing global pneumonia and other respiratory attributable mortalities.

Wekebere



Wekebere Limited is a Ugandan-based company developing a medical device for maternal monitoring to provide access to timely, accurate, affordable, and effective antenatal monitoring healthcare services. The company has developed four generations of prototypes and is currently preparing to conduct clinical studies on the device with 200 mothers in Uganda. Their partnership with Makerere University has facilitated approvals for the study, which is targeted at testing the safety and efficacy of the device in the road map for commercialization.

According to the WHO, 830 women die every day globally from preventable pregnancy complications and childbirth, with 99% of these deaths coming from low-resource settings. In Uganda, 18 mothers and 21 babies die every day because of delayed diagnosis and a lack of timely intervention caused by overcrowding at healthcare facilities, low staffing capacity, and lack of sufficient medical equipment.

Wekebere's maternal monitoring device for expectant mothers uses sensors and a data engine to monitor and analyze three vital parameters: fetal heart rate, fetal movement, and uterine contraction. This facilitates the provision of crucial information to doctors for early interventions leading to improved birth outcomes.

Photo Kabada

Photo-Kabada Ltd is a Ugandan-based company. It is developing a remotely monitored hybrid phototherapy machine that's capable of treating multiple babies with Jaundice simultaneously. The company is currently developing their second prototype device to fit a more human centered design. Their mission is to develop a context specific, affordable, and scalable medical device. The primary challenge is jaundice. This is a medical condition with yellowing of the skin or whites of the eyes, arising from excess of the pigment bilirubin and is typically caused by obstruction of the bile duct, liver disease, or excessive breakdown of red blood cells.

According to a study done by Makerere University at Mulago Hospital in 2009, 21% of newborns had neonatal jaundice. Sixteen percent of them died from jaundice after seven days. The secondary problem is overcrowding at maternity wards in hospitals that predominantly serve the base of the pyramid. In these facilities, it is not uncommon to see babies affected by jaundice sharing a machine for treatment and others with mild cases being unable to receive proper treatment.

Photo-Kabada is designing a machine that will be capable of treating multiple babies with jaundice simultaneously and remotely. This is a more context specific phototherapy machine that will be more affordable than what is currently available.

Drop Access

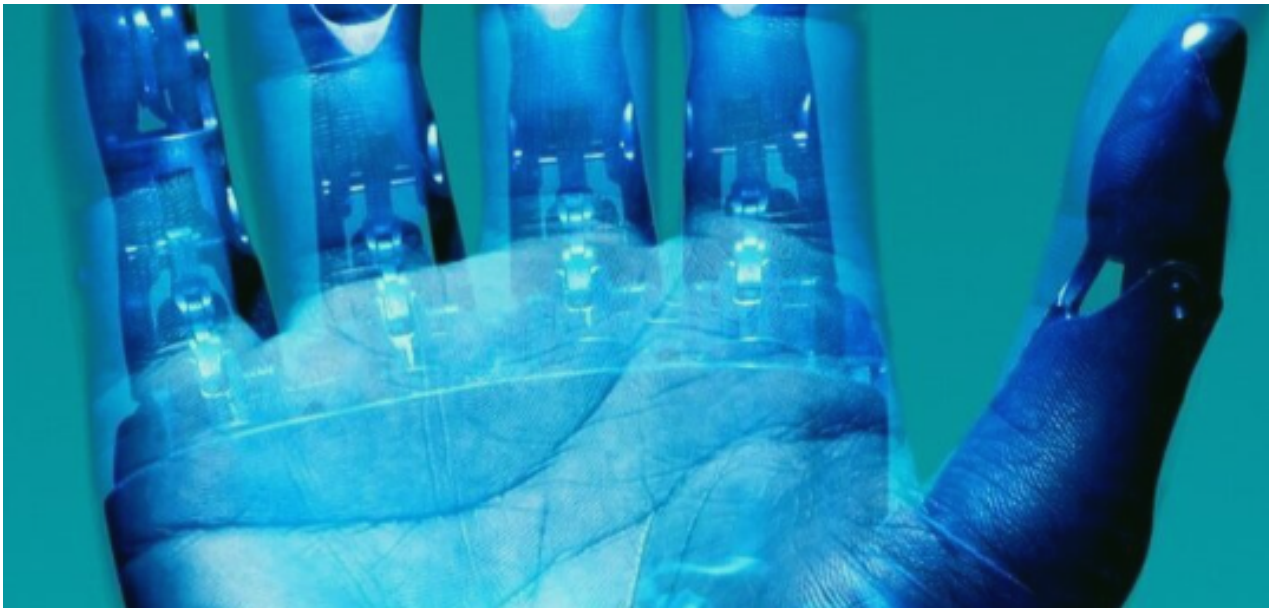
Drop Access is a Kenyan company locally manufacturing portable, solar powered, smart fridges that can be mounted on a motorbike, bicycle, or boat, to transport vaccines and other medical items to rural, off-grid, and hard-to-reach communities.

The fridge is lightweight (25kgs or less) and has 50 liters in internal capacity to enable its portability. Other than operating on sustainable solar energy, it comes complete with an inbuilt battery backup to ensure that it remains in operation at night and during periods of low solar resource. Its operating temperature is between +2 to +8 degrees Celsius to permit storage of a wide range of healthcare items as well as fresh food. It is integrated with a remote data collection and monitoring capability that can tell temperature, location, stock, and fridge operations from any place on earth in real time.

The products offer the following as value-adds to their customers:

- Increased shelf life of vaccines and other medical items up to their expiry date (on average one year from the date of production).
- Real-time access to child-based vaccines and other healthcare items due to increased geographical reach.
- Real-time data monitoring by the Drop Access.

Rover Labs



Rover Labs is a group of passionate and forward-thinking young individuals driven by a deep desire to contribute to solutions for the challenges within their community.

They are actively striving to embody the transformation they aspire to witness within their community. Rover Labs stands as a dynamic force in 3D-Printing innovations within Tanzania, effectively addressing prevalent societal issues. Their team has achieved significant milestones, including the development of a functional prosthetic hand, ventilator splitters, and face shields, all aimed at addressing critical needs.

Their commitment to innovation, coupled with their dedication to community-driven solutions, fuels their pursuit of positive change.

Tabiri Health

Tabiri Health is a for-profit healthcare technology company that leverages on technology to design and develop low-cost, highly sensitive wearables that will be used in the monitoring of respiratory functions of neonates admitted to neonatal intensive care units. According to the WHO, every year, nearly 40% of all under-five mortalities are among newborns, especially preterms. Of all these neonatal deaths, approximately 44% are attributable to respiratory diseases, primarily pneumonia and neonatal respiratory distress. Low- and middle-income countries (LMICs), including Kenya, account for 99% of these neonatal deaths. Notably, it has been shown that timely diagnosis and focused management of patients can prevent up to two-thirds of these neonatal deaths.

Their solution, "Mwana", is a wearable, non-invasive and wireless respiratory monitor that will consist of two units: a chest and a limb unit. The Tabiri Health Platform will use machine learning models to analyze data collected from both units (together with input clinical history) to predict the probability of the wearer developing respiratory complications, including respiratory failure. The interpretations of the inputs from the vest and the limb unit will then be sent to clinicians for determination of the best treatment modality.

Appendix C: Press Coverage

Tuko

Capital FM

Citizen Digital

KTN News Interview

TRANSFORMING AFRICAN MEDTECH CONFERENCE

Our Partners

Villgro africa
Jaza Rift Ventures
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Ifakara Innovation Hub Beyond creativity
EAST AFRICA BIODESIGN