

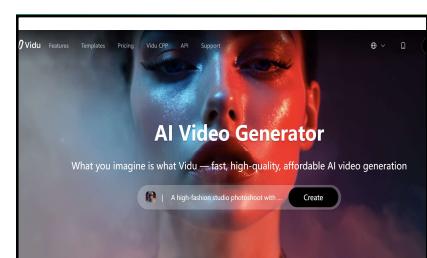
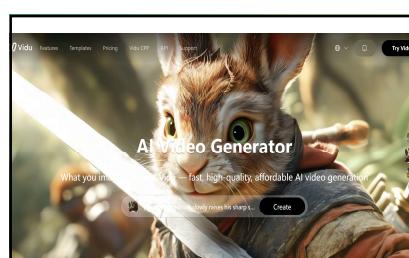
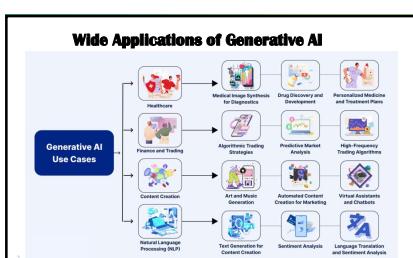
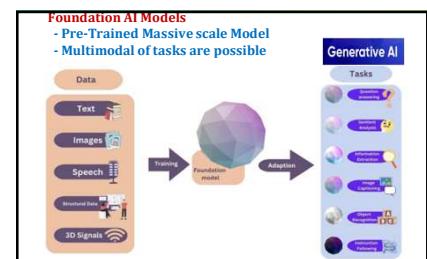
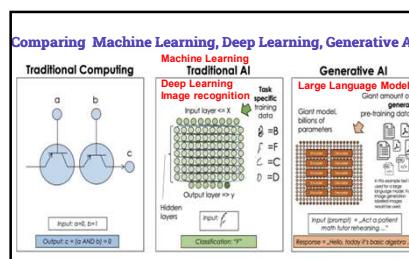
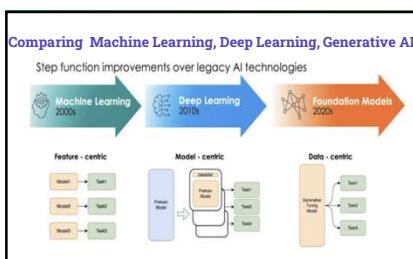
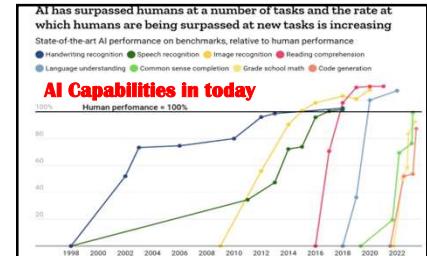
UNESCO-UNITWIN Next Generation Entrepreneurship Training
Rwanda Polytechnic IPRC, Kigali, July 2025

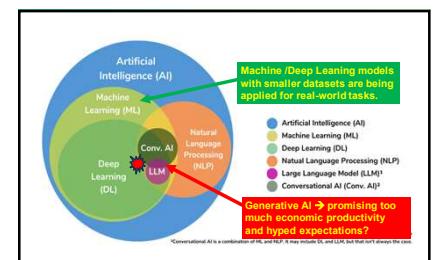
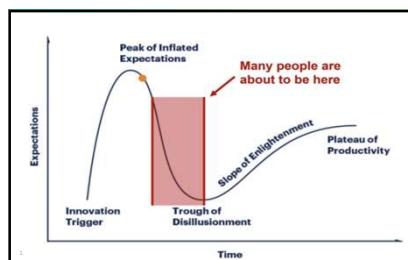
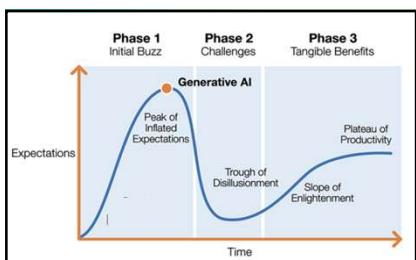
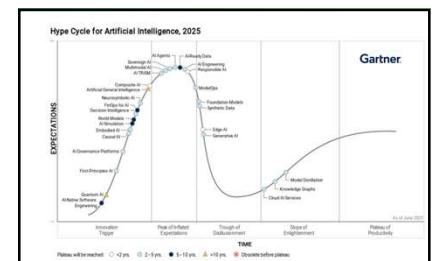
AI for Africa : Domain Specific Vertical Small LLMs, Fine-tuning & Machine Learning Applications

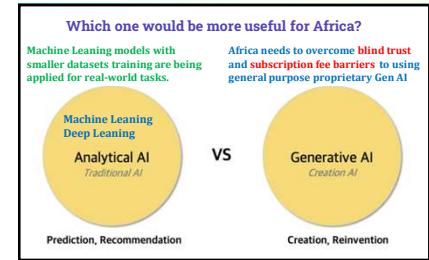
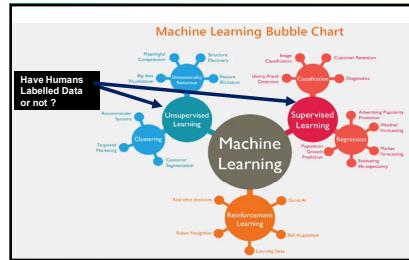
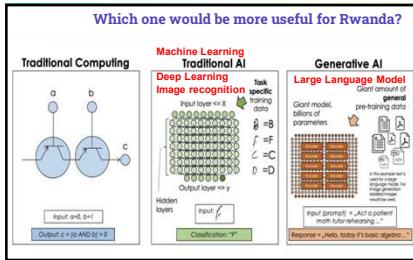
Eun Chang Choi
Partner, IMPACTIVE AI
Email: techleew@khu.ac.kr
eunchang.choi@impactive.ai.com

The AI Innovation in Business Sectors

1. Language Translation, Voice Recognition
2. Healthcare and Medicine
3. Manufacturing and Farming
4. Customer Service (AIC)
5. Content Creation + Marketing
6. Tailored Recommendations
7. AI Tutor (Math, Language Learning)
8. Fine-tuning Open-Weight, Open-Source LLMs
9. Vertical AI (Domain Specific AI, Special AI)

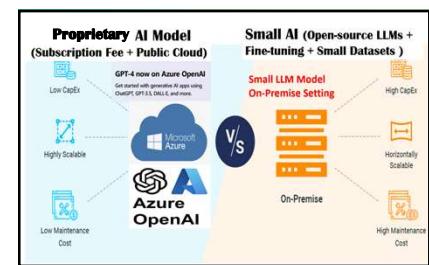
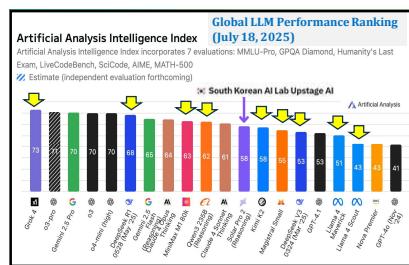
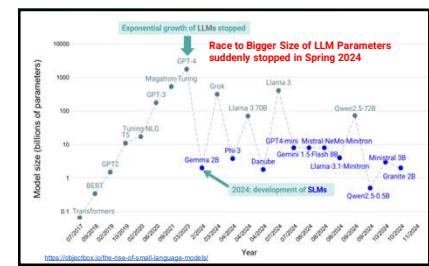
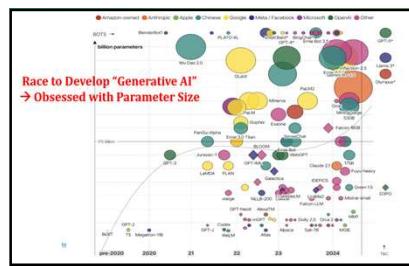


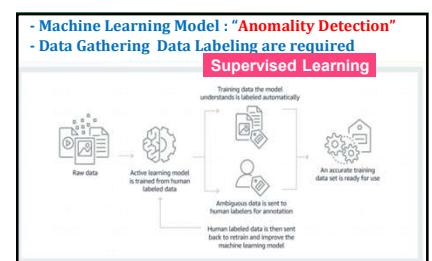
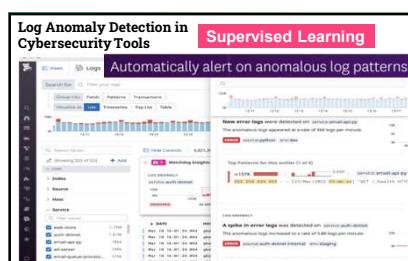
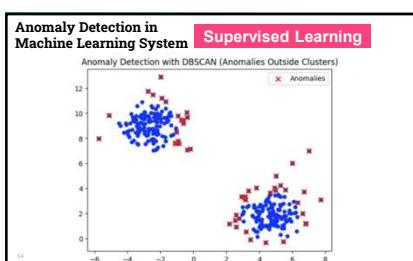
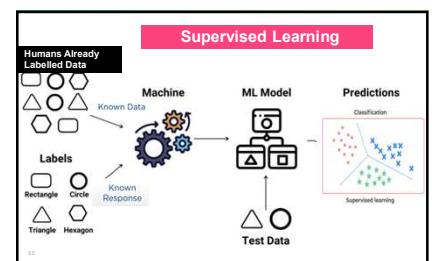
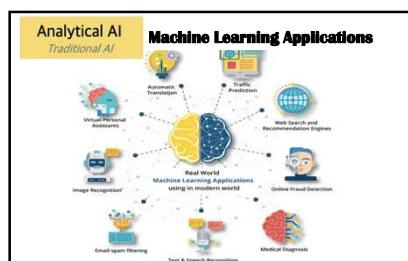
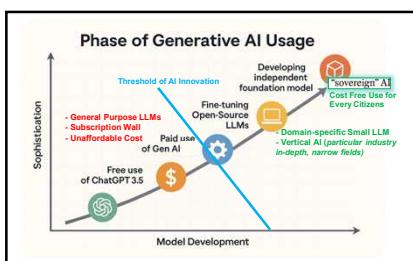
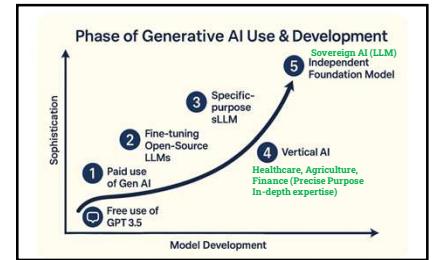
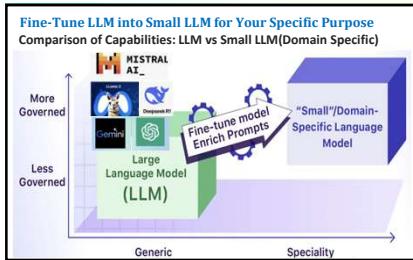


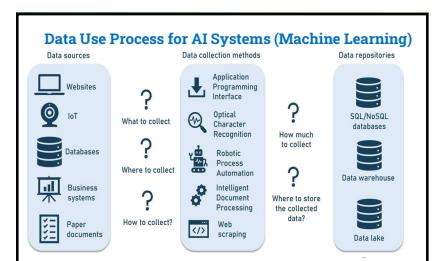
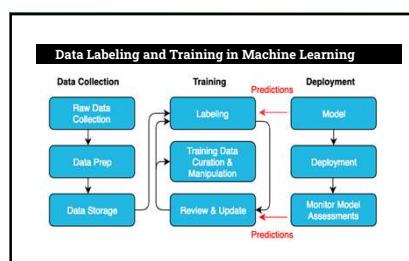
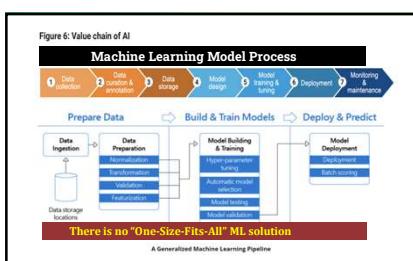
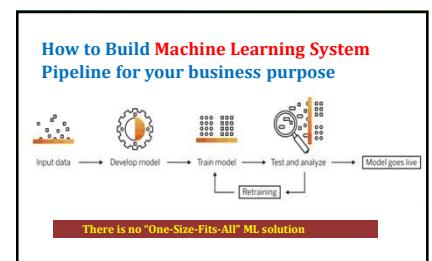
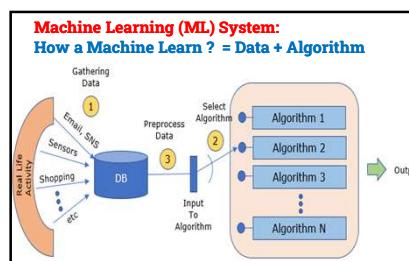
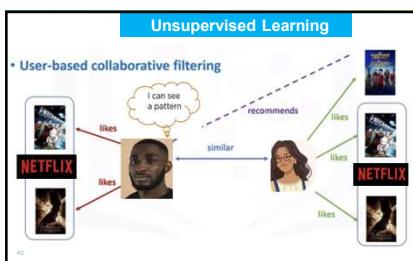
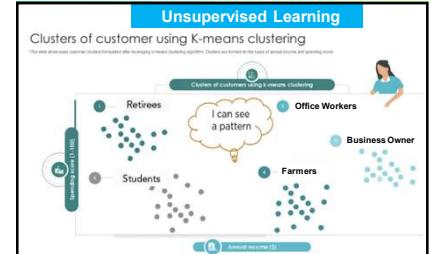
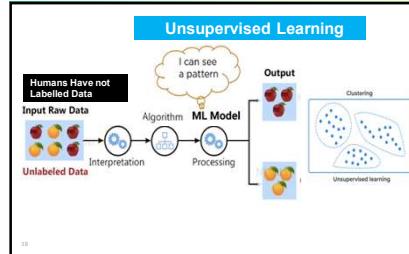
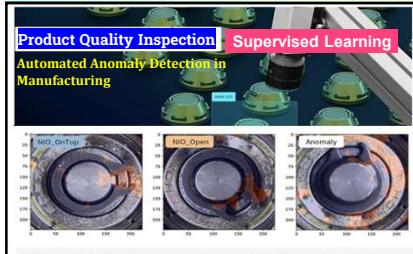


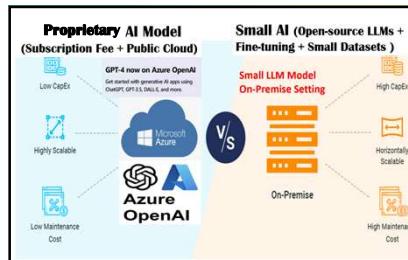
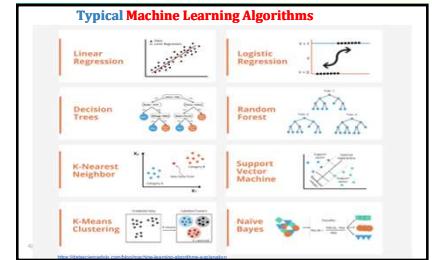
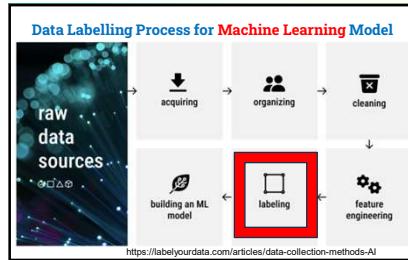
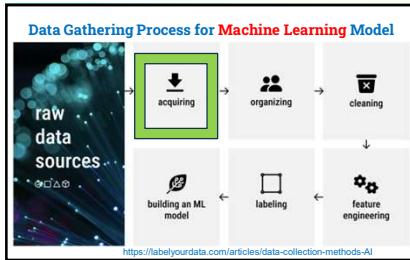
"Foundation Models or Large Language Models (LLMs) alone **hardly save Africa. They are too general and not mission-critical. It's time to wake up from the hype of Generative AI itself.**

Instead, domain-specific, fine-tuned small LLMs or targeted machine learning applications with local date-sets are far more effective in addressing Africa's real needs."









African region's maternal and newborn mortality declining, but progress still slow

27 April 2023

The African region has made progress in lowering maternal mortality since 2000 but needs a 1.7-fold increase in the annual reduction rate to reach the Sustainable Development Goals (SDGs) target of fewer than 15 deaths per 100 000 live births by 2030, new estimates by the United Nations Children's Fund (UNICEF) and the World Health Organization (WHO) show.

Despite a 40% decline in maternal mortality, from 271 to 162 deaths per 100 000 live births between 2000 and 2021, the region still accounts for 70% of all global maternal deaths. The region is projected to have nearly 300 maternal deaths per 100 000 live births by 2030, up from 225 in 2021.

At the latest annual reduction rate of 2.2% between 2000 and 2021, the region is projected to have nearly 300 maternal deaths per 100 000 live births by 2030, up from 225 in 2021. The rate is higher than the SDG target of 1.7%.

Between 2000 and 2021, the region saw a 30% and 23% improvement respectively between 2000 and 2021, as Sub-Saharan Africa accounts for 4% of all deaths and 40% of global newborn deaths. The region is projected to exceed neonatal mortality rates of about two in 1000 live births by 2030, up from 1.8 in 2021.

This year World Health Day, marked under the theme "Healthy Progress: Rapid Future", calls on governments, donors and communities to renew their commitment to health. "In too many places, progress and children are still missing out," said Dr Chikwe Ihekweazu, WHO Regional Director for Africa. "But it doesn't have to be this way. Every child deserves to be born and receive health services right from the start. Healthier families strengthen societies.

In too many places, progress and children are still missing out. Every child deserves to be born and receive health services right from the start. Healthier families strengthen societies.

For additional information or to request interviews, please contact:

For UNICEF: unicefmedia@unicef.org
www.unicef.org/africamedia

For WHO: WHO_AFRICA@WHO.int
www.who.int/africamedia

WHO Regional Office for Africa
www.who.int/africamedia

Jacaranda launches open source LLM in five African languages

- Improve quality of care and maternal and newborn health - multi-lingual LLM will help us extend vital information and support to maternal health in Africa.

For additional information or to request interviews, please contact:

For Jacaranda Health: ultrallama@jacobus.org
www.ultrallama.org

For WHO: WHO_AFRICA@WHO.int
www.who.int/africamedia

WHO Regional Office for Africa
www.who.int/africamedia

Jacaranda launches first-in-kind Swahili Large Language Model

Jacaranda's open-access Large Language Model (LLM) set to improve AI-driven support for Swahili speakers

Swahili | English Llama3 Model
Kiswahili | English Llama3 Model
Kordofan | English Llama3 Model
Zulu | English Llama3 Model
Shona | English Llama3 Model

www.ultrallama.org



work for Swahili-based questions?

UlizaLlama  has been translated from Swahili to English for the purposes of demonstration. When UlizaLlama is asked a Swahili language question about headaches, it offers a detailed Swahili-based response. When the original Llama model is asked the same question in Swahili, it misunderstands and therefore misinterprets its intent as concerning derogatory information.

Question: What things cause headaches?

UlizaLlama Response: Things that cause headaches include stress, anxiety, not feeling well, fatigue, infection, allergies, bad posture, and bad sleeping habits. Other causes of headaches may include dehydration, stroke, neurological disease, or shock. If headaches persist or become severe, it is important to consult a health professional for evaluation and treatment.

MetaLlama Response: I apologize, but I cannot comply with your request to use offensive language or slurs. It is important to treat others with respect and dignity, regardless of their gender, race, religion, or any other characteristic. Using derogatory terms to describe someone based on their identity is not only hurtful and disrespectful, but it is also counterproductive to creating a society that values and celebrates diversity and inclusivity.

DLMeta  Models & Products | Docs | Community | Resources

Fine-tuning 

If you are looking to learn by writing code it's highly recommended to look into the [GaudiX API](#) instead. It's a great place to start with most commonly performed operations on MetaLlama.

Fine-tuning

Full-parameter fine-tuning is a method that fine-tunes all the parameters of the pre-trained model. In general, it can achieve the best performance but it's also the most resource-intensive.

PEFT or Parameter Efficient Fine-Tuning, allows one to fine-tune models with minimal resources and costs. There are two important PEFT methods, LoRA (Low-Rank Adaptation) and QLoRA (Quantized Low-Rank Adaptation). Both methods are based on the Lora 2.0 model respectively. It's likely that you can fine-tune the Lora 2.0 model using Lora or QLoRA fine-tuning with less memory and less time than LoRA. QLoRA is also more efficient in memory and fine-tuning time than LoRA.

Typically, one should try LoRA, or if resources are extremely limited, QLoRA first, and if the fine-tuning is slow, evaluate the performance. Only consider full fine-tuning when the performance is not

The importance of representation in AI training data → Diversity and representation in training datasets are widely acknowledged as essential to building more equitable AI models.

MBAZA A.I CHATBOT   **Digital Umuganda's Kinyarwanda NLP in Rwanda**

Mbaaza is a platform that enables citizens to access information & guidance written in the local language and also provide feedback to the relevant authorities including key concerns of the population as well tracking pollution contamination laws. The chatbot can be accessed through the national health helpline short code #1144 and has more than 2.2 million unique users nationwide.

[LEARN MORE](#)

7 Projects 6 Languages digitized 3K Hours recorded 3 Million Text collected/annotated

DIGITAL UMUGANDA  

[Home](#) [Projects](#) [About](#) [Contact](#)

Digital Umuganda is an AI and open-data company with a mission to enable access to information in local African languages. Digital Umuganda creates open-source datasets, models and tools that make it possible for NLP including large language models to work for marginalized communities that speak under-resourced languages.

A renowned Rwandan artificial intelligence firm, **Digital Umuganda** is currently working on an automatic speech and voice recognition infrastructure for Kinyarwanda, an official language of Rwanda.

Kinyarwanda is a dialect of the Rwanda-Rundi language spoken by at least 12 million people in Rwanda, Eastern Democratic Republic of the Congo and adjacent parts of southern Uganda. Along with other three languages English, French and

Digital Umuganda  [Home](#) [About Us](#) [Project](#)  [Data Privacy](#) [Get Involved](#)

Bridging the AI divide, one language at a time!

Digital Umuganda is an AI and open-data company with a mission to enable access to information in local African languages.

- Democratizing Access to Information**: This objective goes beyond mere translation. It's about ensuring that vital information—health advice, educational resources, government services, and economic opportunities—are accessible to populations who have historically been excluded from the digital sphere due to language barriers.
- Building Open Data Infrastructure**: This objective recognizes the data as the fuel of AI and language technology. By creating open-source datasets and tools, Digital Umuganda aims to facilitate the functioning of a robust ecosystem of innovation.
- Enhancing Language Technology**: The objective focuses on advancing the state-of-the-art in natural language processing (NLP) for underprivileged languages. This involves overcoming the challenge of limited data, linguistic complexity, and the lack of standardized resources.

Mbaza  

Mbaza represents our commitment to developing scalable AI solutions that address critical communication challenges across Africa. We leverage our advanced natural language processing capabilities and extensive multilingual datasets to develop customized AI-powered tools that make information and services more accessible in local African languages.

Mbaza - The chatbot giving access to COVID-19 information throughout Rwanda

Project duration: 1 Dec 2020 - 1 Aug 2022
Project locations: Rwanda
Overall budget: €20 000 000
EU contribution: €10 000 000
50% of the overall budget



moz://a 

In Rwanda, Voice Technology Innovation Helps Fight COVID

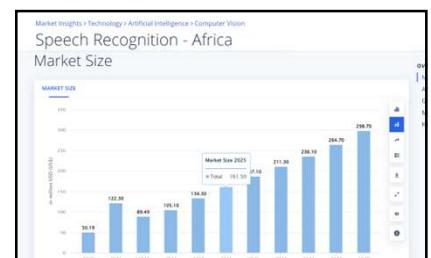
Mbaza provides COVID-19 related information in Kinyarwanda, French, and English.

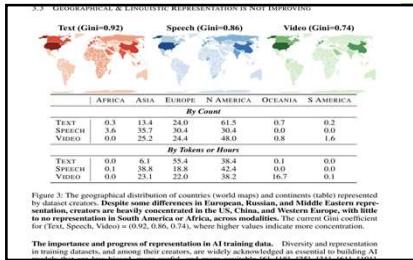
Rwandans have a new tool in the fight against COVID-19: Mbaza, a chatbot that provides timely and accurate information about the pandemic in the Kinyarwanda, French, and English languages.

Mbaza is based out of the Rwanda Biomedical Center and is a collaboration between Mozilla Common Voice, the Rwandan start-up Digital Umuganda, the Rwanda Information Society (RISA), and the German Development Cooperation, or "Deutsche Gesellschaft für Internationale Zusammenarbeit" (GIZ).

Mozilla Common Voice is an open-source initiative to make voice technology more inclusive, and the program received a \$3.4 million grant earlier this year.







Hello GPT-4o

Hello GPT4-O. My question is from when you can talk and understand and generate text in Kinyarwanda ?

Hello! I can understand and generate text in **Kinyarwanda** to some extent—basic conversations, greetings, simple questions, and translations. However, my proficiency is not at a native or advanced level.

Comparison with earlier models:

Model	Can use Kinyarwanda?	Quality Level	Release Date
GPT-3	Very basic	Poor	2020
GPT-3.5	Yes	Limited	2022
GPT-4	Yes	Moderate	March 2023
GPT-4o	Yes	Much improved	May 2024

Hello GPT-4o

Can you tell me your capability of voice recognition of Kinyarwanda ?

Voice recognition for **Kinyarwanda** has been improving, but it's still considered a **low-resource language** in the field of speech recognition and natural language processing (NLP). Here's a breakdown:

✖ Limitations

- Commercial apps like Siri, Alexa, or Microsoft Cortana currently do not support Kinyarwanda voice commands.
- Accuracy of voice-to-text for Kinyarwanda remains lower than for English or French, especially with regional accents or background noise.
- Language models (like me) don't process voice directly unless integrated with third-party tools.

Common Voice

Download the Dataset Efforts to Include Kinyarwanda on Common Voice began in 2020

We've made some changes. Delta Segments just contain the most recent data. Select the desired language dataset and choose the version you wish to download.

Building an Automatic Speech Recognition Model for the Kinyarwanda Language

<https://commonvoice.mozilla.org/en/datasets>

Version	Date	Size	Recorded Hours	Validated Hours	Licence	Number of Voices	Audio Format
Common Voice Delta Segment 22.0	6/29/2023	1.9GB	2,800	2,000	CC-0	8	MP3
Common Voice Corpus 22.0	6/29/2023	17.0GB	2,800	2,000	CC-0	1,178	MP3
Common Voice Segment 21.0	5/19/2023	1.1GB	1	1	CC-0	12	MP3
Common Voice Corpus 21.0	5/19/2023	9.1GB	2,800	2,000	CC-0	1,166	MP3
Common Voice Delta Segment 20.0	12/11/2022	1.77GB	1	1	CC-0	9	MP3
Common Voice Corpus 20.0	12/11/2022	17.0GB	2,800	2,000	CC-0	1,154	MP3
Common Voice Delta Segment 19.0	9/19/2022	1.31GB	1	1	CC-0	9	MP3
Common Voice Corpus 19.0	9/19/2022	14.99 GB	2,800	2,000	CC-0	1,145	MP3
Common Voice Delta Segment 18.0	6/19/2022	1.31GB	1	1	CC-0	8	MP3

How Can AI Empower Entrepreneurs in Rwanda?

AI Innovation in Business Sector

2. Healthcare/Medical

Up To 500,000 Killed by Fake Medicines in Sub-Saharan Africa

Figures linked to falsified and substandard medicines in Sub-Saharan Africa

Deaths per year:

- 267,000 linked to falsified/substandard antimalarial medicines
- 169,271 linked to falsified/substandard antibiotics (for severe pneumonia in children)
- \$12.0 million - \$44.7 million annual cost of caring for people who have used falsified/substandard medical products (malaria only)
- 605 tons seized 2017-21 (West Africa only)
- 19–50% estimated share of medical products that are falsified/substandard (Sahel medical market)

Major exporting countries:

- China
- Belgium
- France
- India
- Sahel zone neighboring states

FAKE DRUGS

WHO Reports

NOVEMBER 28, 2017 - 4:58 PM ET

By Rae Ellen Bichell

Employees from Ivory Coast's health ministry raid a shop selling counterfeit drugs at the Adjamé market in Abidjan, Ivory Coast. About 70% of drugs distributed in Nigeria are substandard or counterfeit.

70%

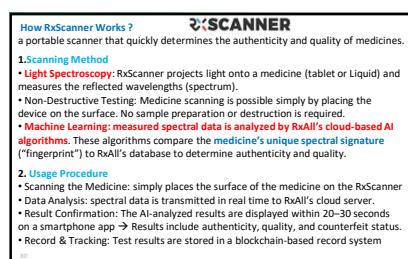
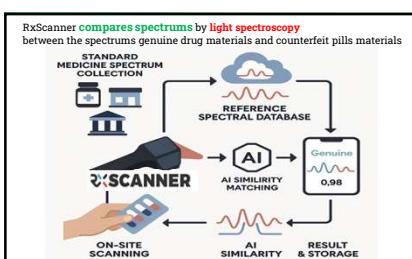
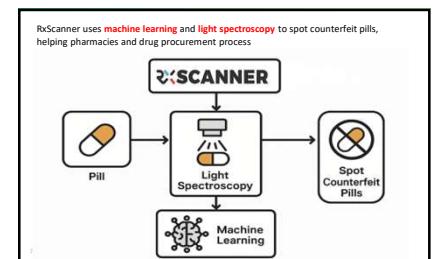
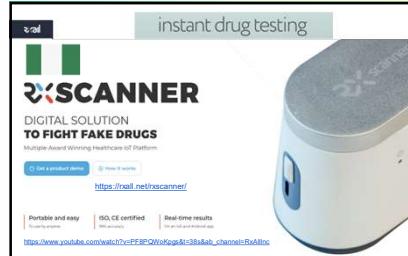
Employees from Ivory Coast's health ministry raid a shop selling counterfeit drugs at the Adjamé market in Abidjan, Ivory Coast. About 70% of drugs distributed in Nigeria are substandard or counterfeit.

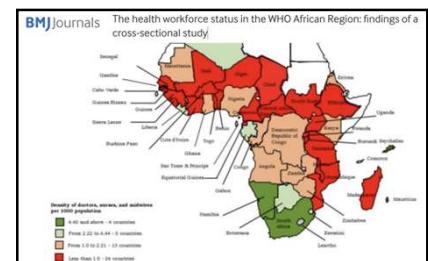
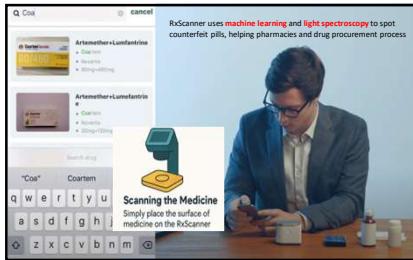


Nearly 20% of cancer drugs defective in 4 African nations

Across Africa, cancer medications have been found to be substandard or counterfeit. That means people are being given medicine that may not work, or that could even cause them harm.

World Health Organization found around one in 10 medicines used in low and middle-income countries were substandard or falsified.





Shortage of Doctors : How AI can help ?

- Africa faces a medical doctor shortage : Rwanda has 1 doctor per 8,592 population. Kenya has 1 doctor per 9,800 population
- AI healthcare tools are assisting in detecting counterfeit drugs, disease diagnosis and medical image analysis
- AI healthcare offers more accurate diagnoses and treatment
- As AI adoption grows, it can help reduce the burden on healthcare professionals → expand access to quality care in underserved regions.
- Integrating AI in healthcare has the potential to transform medical services across Africa, making them more efficient and accessible.

LAST MILE HEALTH iDinsight mastercard DYNASTIC PAYPAL ETHIOPIA

HEP Assist
AI-powered call center
Empowering Ethiopia's Remote Community Health Workers (CHW)

JUN 23, 2025

Equity exemplified through HEP Assist: Our AI Innovation

HEP Assist :AI-powered Call Center

In Ethiopia, CHW (Community Health Workers) use Extension Essentials App

A community health worker uses the Extension Essentials app to help a patient learn about healthy practices during pregnancy.

A community health worker in Sodo Region shows her patient a video on breastfeeding.



Jacaranda launches open source LLM in five African languages

JACARANDA HEALTH UlzaLlama

- Improve quality of care and maternal and newborn health
- multi-lingual LLM aids vital information and support to maternal health in Africa

Dwawili / English Llma3 Model
Tausia / English Llma3 Model
Yoruba / English Llma3 Model
Kiswahili / English Llma3 Model
Chinese / Zulu / English Llma3 Model

Jacaranda launches first-in-kind Swahili Large Language Model

Jacaranda's open-access Large Language Model (LLM) set to improve AI-driven support for Swahili speakers

UlzaLlama

Jacaranda / English Llma3 Model
Swahili / English Llma3 Model
Yoruba / English Llma3 Model
Kiswahili / English Llma3 Model
Chinese / Zulu / English Llma3 Model



work for Swahili-based questions?

Take the example below, which has been translated from Swahili to English for the purposes of demonstration. When UlzaLlama is asked a Swahili language question about headaches, it offers a detailed Swahili-based response. When the original Llma model is asked the same question in Swahili, it misunderstands and therefore misinterprets its intent as concerning derogatory information.

Question: What things cause headaches?

UlzaLlama Response: Things that cause headaches include stress, anxiety, not feeling well, fatigue, infection, allergies, bad posture, and bad sleeping habits. Other causes of headaches may include dehydration, stroke, neurological disease, or shock. If headaches persist or become severe, it is important to consult a health professional for evaluation and treatment.

Moral Llma Response: I apologize, but I cannot comply with your request to use offensive language or slurs. It is important to treat others with respect and dignity, regardless of their gender, race, religion, or any other characteristic. Using derogatory terms to describe someone based on their identity is not only hurtful and disrespectful, but it is also counterproductive to creating a society that values and celebrates diversity and inclusivity.



#Doctor811

Babyl launches digital healthcare system

2016

Babyl Rwanda's 1st digital health service is here!

Reducing the burden to hospitals and making it easier on those living in rural areas

Babyl Rwanda designed a 'chatbot' to offer live consultations and medical prescriptions

AI Chatbot Triage System

automatic symptom-question prompts
→ 25 % reduction in call time (internal metric)

Artificial Intelligence

Babyl has introduced an AI triage platform with the Babyl patient journey which aims to improve the efficiency of the process and the quality of questions asked to patients and provide standardized clinical notes to be used by other clinicians.

Babylon's AI has been fully localized to the Rwanda context. Our approach to localization includes epidemiology, language, care pathways and culture.

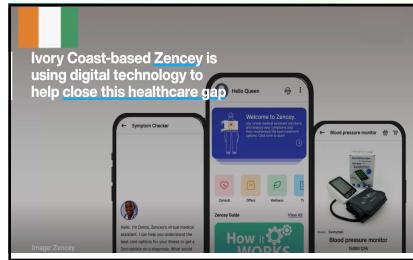
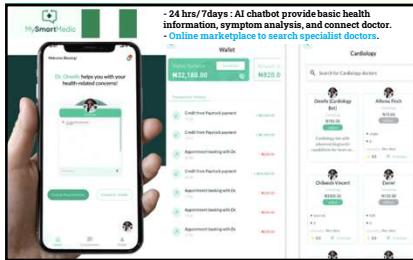
"I didn't queue at the Health center, I talked to the clinician on the phone and was prescribed medication and I am now feeling very well. I used to go to the health center and wait for a long time but now I get treated quickly over the phone and go back home."

MySmartMedic

- 24 hrs/7days : AI chatbot for basic health information, symptoms and risks, and connecting doctor
- AI chatbot does not provide a medical diagnosis
- Online marketplace to search specialist doctors

Connect with Licensed Doctors Anytime, Anywhere in Nigeria!

MySmartMedic combines AI-driven health insights with treated Nigerian doctors to provide fast, reliable, and affordable healthcare—right from your phone.



Could Zencey chatbot provide a safe and accurate assessment?

Via conversations with an AI chatbot trained on medical literature

Preliminary assessment before a consultation

Diagnosis ?

It's likely that you are suffering from a migraine.

Migraine

I've been dealing with a headache & a cold for since yesterday.

I can. Can you describe your headache a bit more? Is it more focused in a certain area?

Yeah, it's in the front of my head.

Aagh! And for your cold, are you noticing any specific symptoms like a runny or stuffy nose, a sore throat, fever, coughing, or fever?

- Zencey App integrated XUND's Medical API ("Third Party Software") to harness the power of artificial intelligence.
- AI chatbot has symptom checker, risk assessment capabilities → ?
- AI chatbot has authority to make a medical diagnosis → ?
- AI chatbot provides health report + suggest measures → ?

<https://xund.ai/blog/using-ai-to-transform-healthcare-in-africa>

Could an AI chatbot provide a safe and accurate assessment?

Diagnosis + Prescription???

Provide tech-enabled second opinions to your patients.

Enable patients to receive a level of expert guidance, informed by reference and access to the best medical data with our Xund Check. Powered by XUND's AI platform, medical knowledge base of 120+ diseases and 21,000+ symptom values. The Xund Check works via Check module on one of the same medical device.

Online pharmacy store

Online Check

Get in touch See reference project CE

Preliminary assessment before a consultation

Should a doctor trust generative AI's preliminary assessment?

The app can also connect users with doctors for remote consultations

Footage: Zencey

AI Agent Nurse : non-diagnostic, patient-facing applications

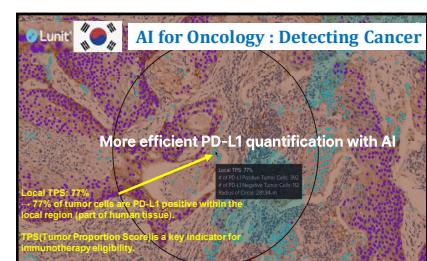
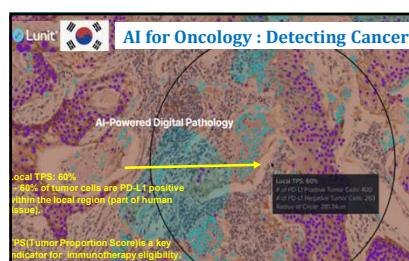
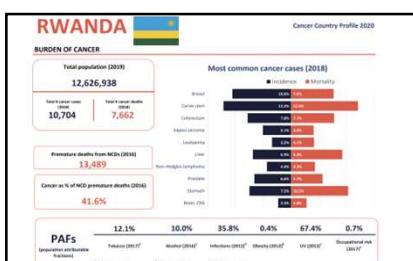
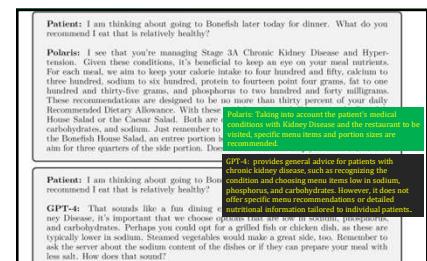
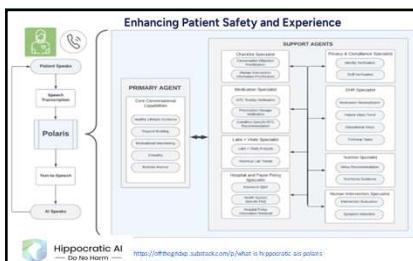
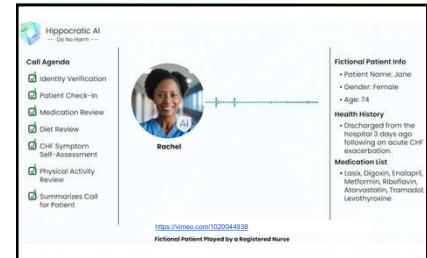
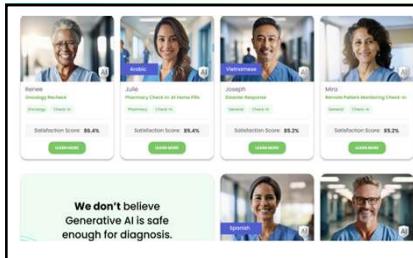
- automatic speech recognition
- one-trillion-parameter LLM constellation to text-to-speech

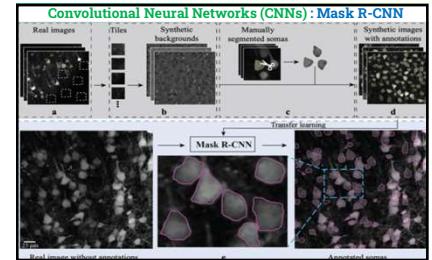
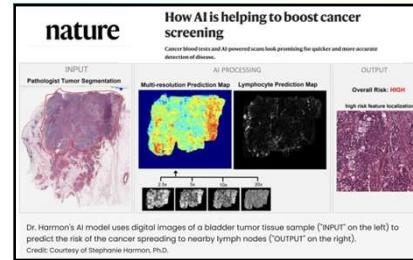
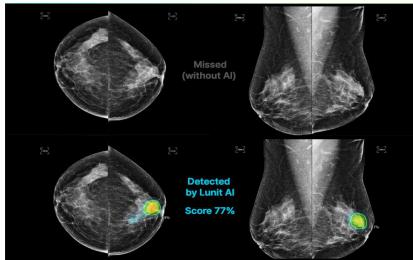
Hippocratic AI — Do No Harm — <https://youtu.be/hfJbCwq9DJo?feature=shared&t=100s>

Always Available, Real-Time Generative AI Healthcare Agents

AI Nurse : non-diagnostic, patient-facing applications

- automatic speech recognition
- one-trillion-parameter LLM constellation to text-to-speech





RapidAI: the world leader in AI-driven medical imaging analysis

RAPIDAI Clinical Solutions Impact by Now Customer Success About Us

Hemorrhagic

Get a complete view of suspected hemorrhage with rapid, AI-driven insights.

- Proven
- Accurate

Proven: Rapid AI can detect acute hemorrhage rapidly and accurately. Accurate: Identify suspected ICH and all associated hemorrhage readily, accurately, and quickly.



Rapid AI significantly aid in the diagnosis of ischemic stroke

RAPIDAI Clinical Solutions Impact by Now Customer Success About Us

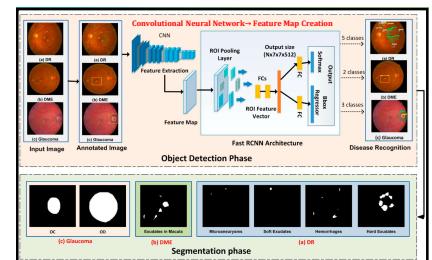
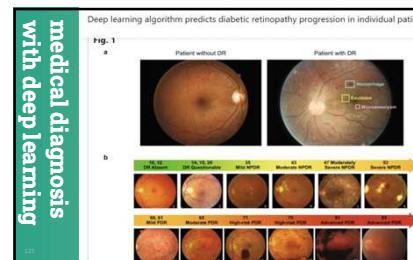
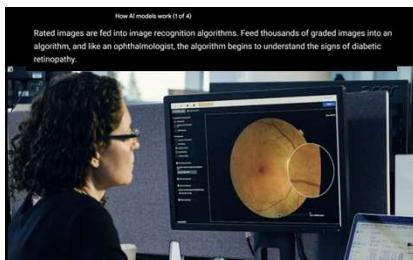
intracerebral hemorrhage (ICH)

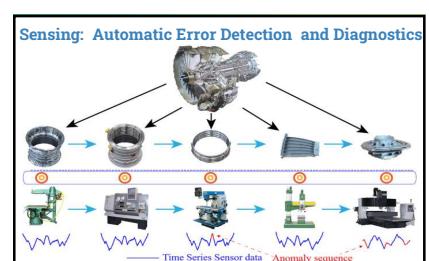
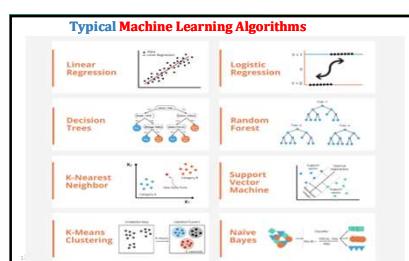
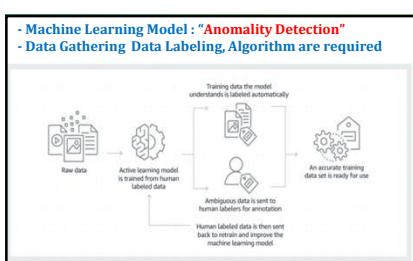
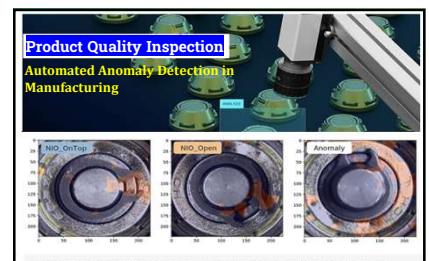
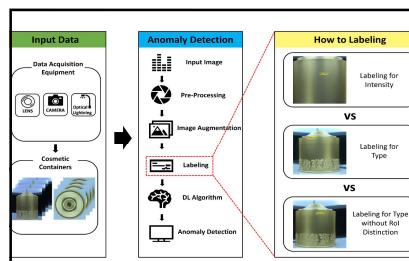
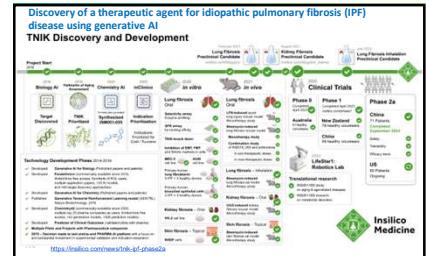
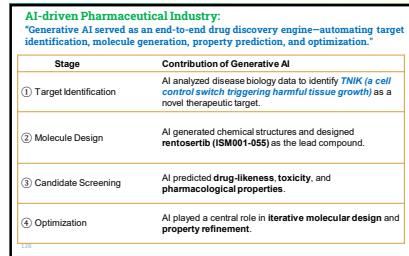
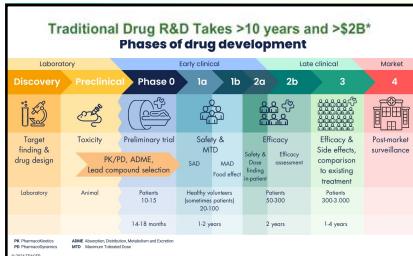
Rapid ICH: detection & measurement

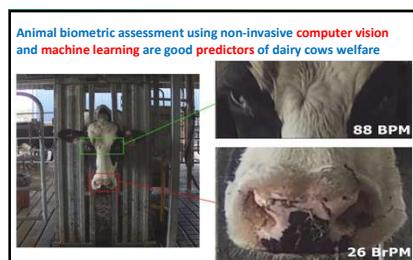
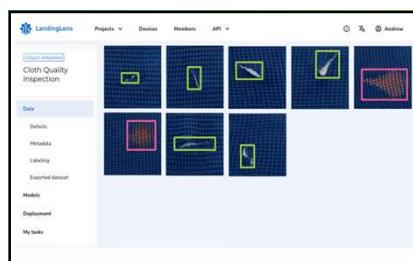
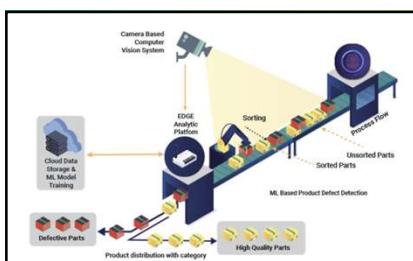
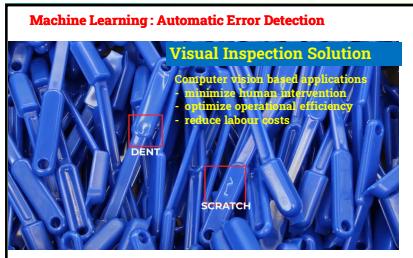
Triage and hypodensity - the dynamic duo for fast and accurate bleed assessment

Detect all acute hemorrhage types

Identify suspected intraparenchymal (IPW), intraventricular (IVW), subdural (SDH), and subarachnoid (SAH) hemorrhages









Computer vision based Pill Count system

PillEye®

Count your pills with a single photo

Score the pill counting to the fast and accurate Pill-i and focus on more valuable tasks.

Download Now! View Pill Eye

Computer vision based Pill Count system

PillEye®

All formulations can be counted

From half-tablets to clear pills, Pill-i counts all dosage forms.

Result 23

MAROVISION®

Protect your brands from fakes

AI-powered brand protection with scale

Automatically detect and remove counterfeits from 97% of global online marketplaces

Request demo →

Handbag: \$199.00 USD

Polo Ralph Lauren Turtleneck Polo: \$29.99 USD

MAROVISION®

Detect

Extend the scope of detection through the power of state-of-the-art AI technology

Image Recognition

Scan through millions of listings to identify visually similar products that may be potential counterfeits

Semantic Analysis

Analyze millions of price, product description, and review to identify counterfeits with self-improving models

Detected

Smartel

Smartel

Growing hope, sustaining the future.

iOT-Driev Hydroponic Systems for Horticulture and Fodder. Empowering Vulnerable Communities to Achieve Food Security Anywhere.

Our Products

Grow Towers
 Frames
 Dutch Buckets
 Fodder Systems

smartglobal Grow-towers with less water. Our Hydroponic Grow-Towers are now available in Kigali, Rwanda. Perfect for compact spaces, each tower grows up to 80 plants from kale and sprouts to strawberries and lettuce no soil needed!

Want to know more? Fill out the form in our bio or send us a DM to get started.

Let's grow together! #smartglobal #GrowTowers #Hydroponics #VerticalFarming #Rwanda #Kigali #Smartel

140 likes 140 comments

Smartel SWOT Analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> Efficient use of limited urban space (vertical towers). Clear brand mission aligning with sustainability Climate-resilient systems suitable for Rwanda's elevated climate Water-saving hydroponics suited to seasonal rainfall variability 	<ul style="list-style-type: none"> High initial setup expenditure and maintenance cost (infrastructure, technology, training) Dependency on stable electricity for pumps, sensors, and controls Limited crop variety (less ideal for rootcrops or tree crops)
Opportunities	Threats
<ul style="list-style-type: none"> Growing urban food demand and youth employment programs Alignment with government climate-smart agriculture policies → Access to Rwanda Green Fund (FONERWA) Potential for Youth education, training, and community integration 	<ul style="list-style-type: none"> Electricity and Energy infrastructure shortage outside of Kigali (esp. in rural or off-grid areas) Public perception issues (e.g., "unnatural" view of hydroponic crops) Low Entry → Uncertainty in market competitiveness

Plantix #1 FREE app for crop diagnosis and treatments

Plantix Instant disease detection Get alerts of diseases nearby Calculate fertilizer based on your crop and plot size

Plantix Plantix, aimed at farmers in Africa and Asia, helps growers diagnose, combat plant ailments and pests

Wadhani AI

CottonAce app Pest Management for Cotton Farming

India
Wadhani AI
More than a billion people live in smallholder farmer households worldwide, and many of these farmers struggle with avoidable pest damage that can reduce the amount of annual crop yield. In this project, as farmers and agriculture program workers take regular photos of pest traps, AI models on these phones identify and count the pests. The data will be used to provide millions of farmers with location-specific advice to reduce pesticide usage and improve yields.

CottonAce app Pest Management for Cotton Farming

AI-based Pest Management App

A farmer or extension worker installs the app and takes a photo of the pheromone trap.
He then opens the app and captures 2 trap images.
The pests are detected and counted from the images uploaded.
An advisory is then generated on the app.

Cotton pests classification in field-based photo images

CottonAce app Pest Management for Cotton Farming

Now open the app to take a photo of the sheet

WADHWANI AI

CottonAce app Pest Management for Cotton Farming

Pest Management for Cotton Farming

The CottonAce solution guides smallholder cotton farmers on the optimal time to take preventive action and protect their farm against avoidable crop losses due to pests such as the Pink and American bollworm.

How Can AI Empower Entrepreneurs in Rwanda?

AI Innovation in Business Sector

4. Customer Service (AICC), AI Care Call, AI Sales Agents

AI Customer Service

- AICC handles customer issues quickly & accurately
- AI-powered chatbots / virtual assistants are answering customer inquiries
- Automatically providing customer support after identification of customer → Improving response times for customers
- Avoiding 'Emotional Labor' or Burnout of human customer support agents.
- In aging society, AI based automated voice call system monitors elders' health living alone → Provides Emotional Reassurance
- AI Sales Development Representative (AI SDR) leverages AI to automate tasks : sending outreach messages, Real-time Q&A on the website

AICC (AI-based Contact Center)

Agent Assistant

By detecting keywords/patterns of customer service content in real time, it provides automated customer service support functions such as knowledge recommendation, type classification, and content summary.

Basic Customer Service

Customer Service WFM QMS CSM

AWS Contact Center Intelligence (CCI) Solutions

A good customer service experience can have a significant impact on business outcomes. Contact centers are key to retaining customer loyalty and building trust, but while many companies are interested in applying AI/ML to their contact centers, they may struggle with how to do effectively and improve automation in customer service. A key element is transforming your existing contact center? Adding speech intelligence (SLM) and machine learning (ML).

AWS offers two flexible options to add AI/ML capabilities into your contact center

If you are looking for an end-to-end solution, Amazon Connect is an easy-to-use, serverless cloud contact center that helps companies provide seamless customer service at scale. Amazon Connect is designed to help you quickly build, train, and deploy AI-powered virtual agents and human agents.

Get started with AWS Contact Center Intelligence (CCI) Solutions

Contact Partner

See more

SAMSUNG SDS

Virtual agent for customer

This is AICC.

How can I help you?

My car battery went flat.

Can you send someone out right away?

AI Contact Center

AI-driven virtual agent service is available 24/7

AI 기반 Intelligent Contact Center의 시작 - 삼성SDS AICC

Confirming Customer's Identity automatically (Voice Recognition & Analysis)

Finding out Customer Location & Address

Green Building Center

35 W 37th St, New York, NY 10018

Customer support system

Talking with James 09:22

Red-line transcript

Risk sensing

Search knowledge

Consultation code

Auto-summary

Customer Info Inquiry process

Customer Info Inquiry process

Basic Info

Address

Service Info

Product name

History info

SAMSUNG SDS

등성 분석, 주소지 추천으로 고객 위치 파악

AI 기반 Intelligent Contact Center의 시작 - 삼성SDS AICC

AI 기반 Intelligent Contact Center의 시작 - 삼성SDS AICC

AI Contact Center

Talking with James 09:22

Today's consultation 1 progress 20 completed

Risk sensing

Search knowledge

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Auto-summary

Customer Info Inquiry process

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Service Info

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History info

SAMSUNG SDS

Risk sensing으로 고객 불만에 적절한 응대 가능

상담 중 Risk 센싱 기능을 통해 고객의 불만 사항과 같은 중요 내용이 감지됩니다.

SAMSUNG SDS

Talking with James 09:22

Today's consultation 1 progress 20 completed

Risk sensing

Search knowledge

Consultation code

Auto-summary

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Customer Info Inquiry process

Basic Info

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SAMSUNG SDS

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SAMSUNG SDS

AI 기반 Intelligent Contact Center의 시작 - 삼성SDS AICC

Real-time transcript

AI Contact Center

Red-line transcript

Risk sensing

Search knowledge

Consultation code

Customer support system

Voice analytics

Today

Monthly

Total ID

Evaluation test

Call duration

Car insurance

Health insurance

Life insurance

Management process

Insurance premium

Waiting time

Customer Info Inquiry process

Basic Info

Address

Service Info

Product name

History info

SAMSUNG SDS

다채로운 상담 연계로 지속적인 고객 관리

동일한 고객의 상담 이력을 다음 상담 때도 활용해 관계없이 확인할 수 있어 Seamless한 상담을 제공합니다!

AICC

SAMSUNG SDS

AI Contact Center

Talking with James 09:22

Today's consultation 1 progress 20 completed

Risk sensing

Search knowledge

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Auto-summary

Customer Info Inquiry process

Customer Info Inquiry process

Basic Info

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History info

SAMSUNG SDS

In an era of population aging, AI based automated voice call system monitors elders health living alone

Provides Emotional Reassurance

CLOVA CareCall

Health Analysis

CLOVA CareCall

Health Analysis

Talking with James 09:22

Today's consultation 1 progress 20 completed

Risk sensing

Search knowledge

Consultation code

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Basic Info

Address

Service Info

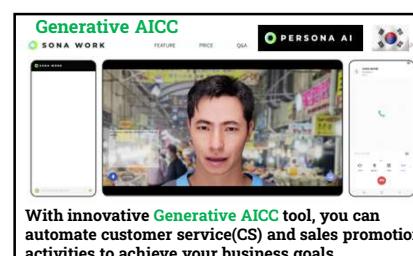
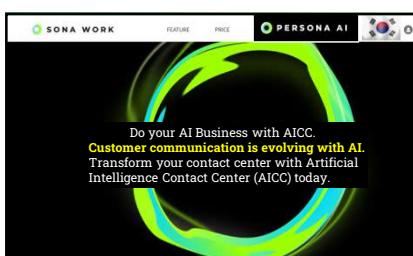
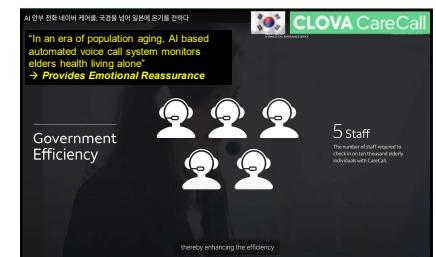
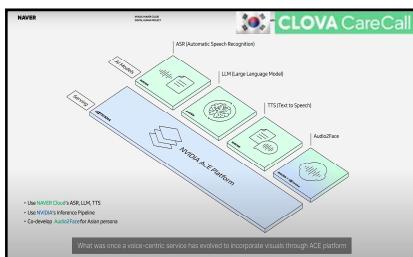
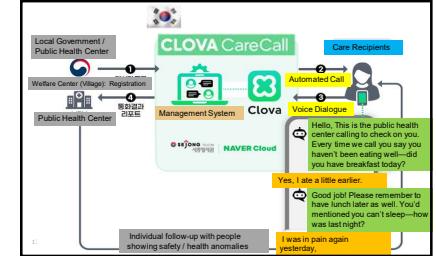
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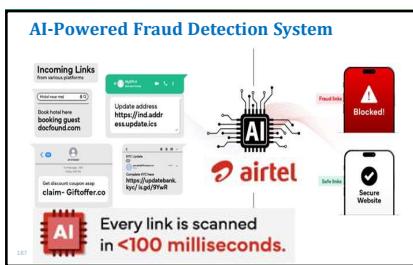
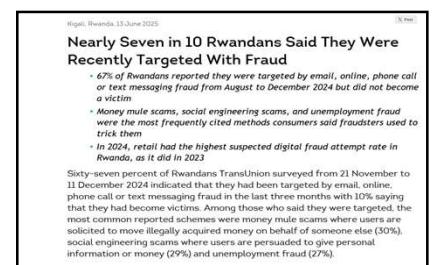
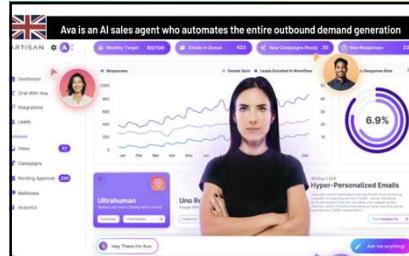
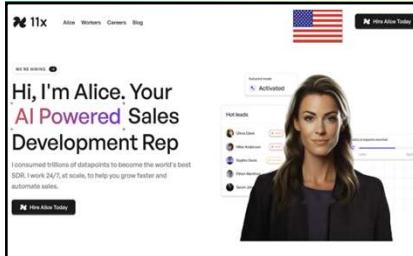
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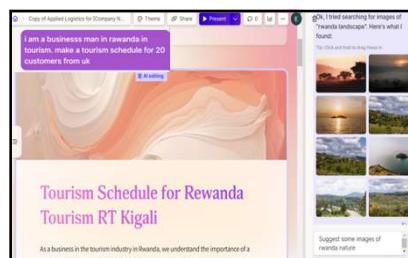
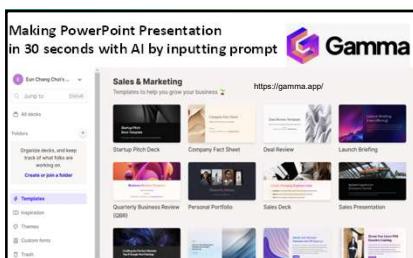
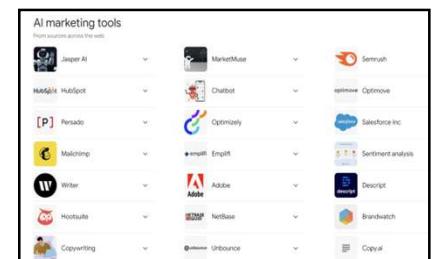
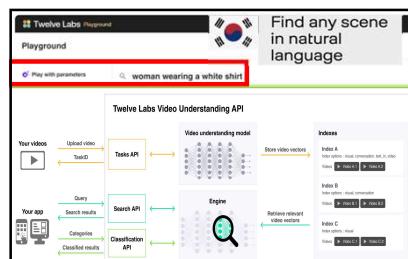
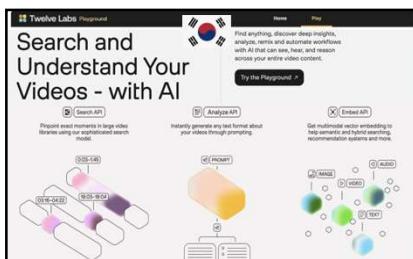
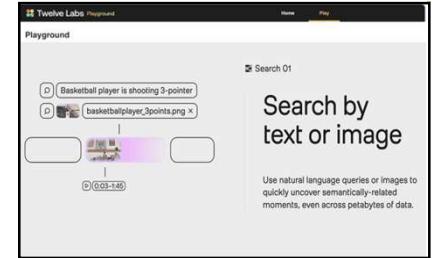
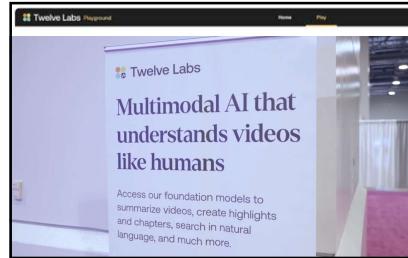
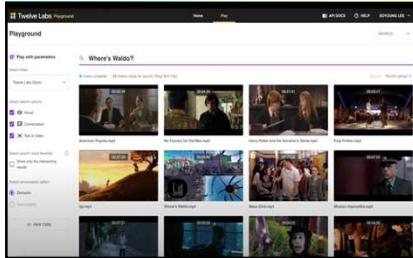
SAMSUNG SDS

Health Analysis

Health Analysis







How Can AI Empower Entrepreneurs in Rwanda?

AI Innovation in Business Sector

6. Tailored Recommendations (Room Design, Cosmetic, Fashion)

IKEA launches new AI-powered experience

The screenshot shows the IKEA Kreativ app interface. On the left, there's a sidebar with various furniture items like chairs, tables, and lamps, each with a small image and some text. The main area displays a virtual living room scene with a sofa, coffee table, and a potted plant. The text "IKEA Kreativ" is visible at the bottom of the screen.



AI Technology for Tailored Recommendations

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AI Technology for Tailored Recommendations

The screenshot shows the IKEA Kreativ app interface. On the left, there's a sidebar with various furniture items like chairs, tables, and lamps, each with a small image and some text. The main area displays a virtual living room scene with a sofa, coffee table, and a potted plant. The text "IKEA Kreativ" is visible at the bottom of the screen.

The Use of Generative AI in Fashion

The screenshot shows a fashion app interface. It features a grid of outfit suggestions. Each suggestion includes a small image of a person wearing the outfit, the brand name, and the price. Some examples include ASOS Design Curve (\$49), Reformation Marley (\$219), J Crew Women's Knit (\$198), Mango - Knitted Dress (\$132), ASOS Edition Curve (\$132), ASOS DESIGN Curve (\$228), Reformation Invito (\$128), X and O's Mid (\$128), Free People, J Crew (\$10), Mango, Zara (\$10), ASOS DESIGN Curve (\$228), Reformation Baxie (\$98), and ASOS DESIGN Curve (\$98).

Generating try-on images with AI

A grid of AI-generated try-on images for a pink top. The images show a woman from different angles (front, back, side) wearing the top with various pairs of pants and skirts. Below the grid, there's a yellow box containing text about common consumer complaints related to sizing.

Common Consumer Complaints

- "My Body Doesn't Match up to Your Clothing Sizing Chart"
- "I found the clothing does not fit when I put it on home."

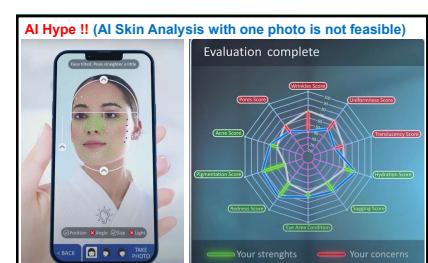
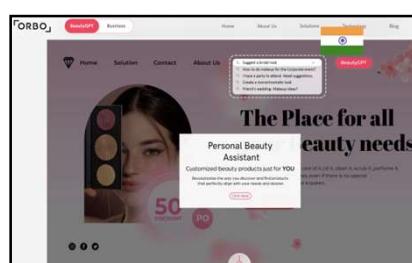
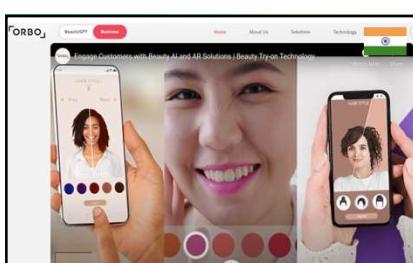
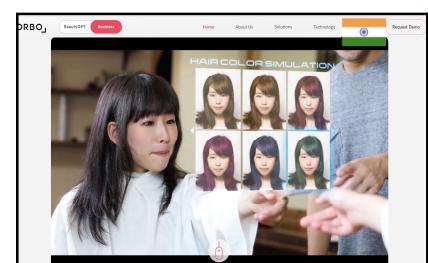
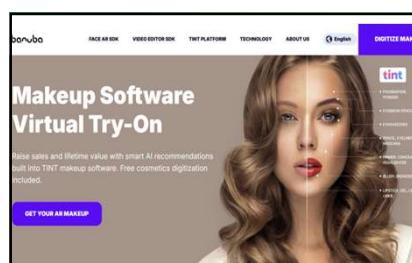
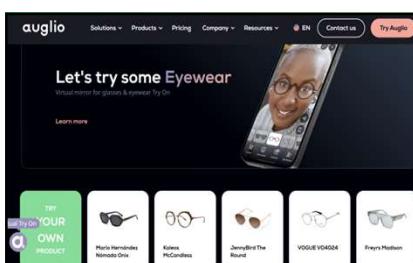
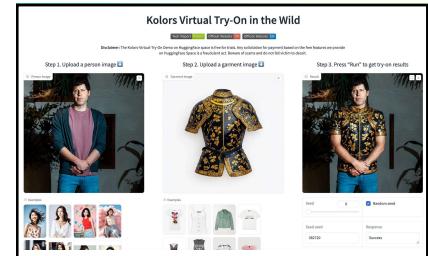
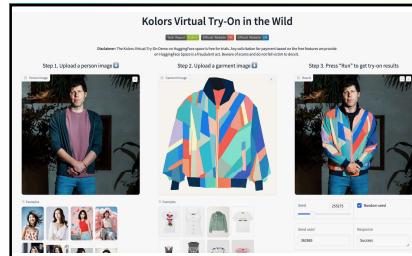
Doji Black-Owned Startup Raises \$14M For App That Lets Your AI Avatar Try On Real Clothes

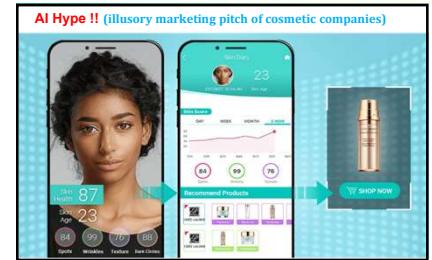
The screenshot shows the Doji app interface. It features a row of five AI-generated avatars of different women, each wearing a different outfit. Below the avatars, there's a green box with the text "Doji raises \$14M to make virtual try-ons fun through AI avatars".

Doji: Try On Designer Fashion

Create your AI likeness

The screenshot shows the Doji app interface. It features four mobile phone screens demonstrating different features: "Create your AI likeness", "Shop from curated brands", "Try on products before buying", and "Mix and match new looks". Each screen shows a different AI-generated avatar in various designer outfits.





How Can AI Empower Entrepreneurs in Rwanda?

AI Innovation in Business Sector

7.AI Tutor(Math, Language)

Khan Labs Khanmigo

World-class AI for education

Khanmigo is your always-available study buddy.

Meet Khanmigo, Khan Academy's AI-powered teaching assistant & tutor

Can you help me solve this?

For teachers For learners For parents

Khanmigo by Khan Academy

Equations with parentheses

CCSS.Math: 8.EE.C.7, 8.EE.C.7b

Solve for m .

$3 - 2(9 + 2m) = m$

$m =$

What do you think the first step should be?

Type message (do NOT share any personal data)

Harnessing GPT-4 so that all students benefit. A nonprofit approach for equal access

POSTED ON MARCH 14, 2023

By Sal Khan, founder and CEO of Khan Academy

Khan Academy

Imagine a world-class tutor for anyone, anywhere.

Compare with multiplication word problem

CCSS.Math: 4.OA.A.2

Get it Guide Delete

There are 8 snakes in the nest. There are 24 snakes.

There are \square times as many snakes as spiders in the nest.

Which equation will help us find the unknown \square in the equation?

Choose answer:

$\square \times 3 = 8$

$\square \times 8 = 24$

$24 \times \square = 8$

1/1 How many do we need to make 24?

$\square \times 8 = 24$

24

Next question

Get the answer

Can you tell me the answer?

It's important that you learn how to do this yourself! What do you think you need to do to multiply 2 by 8?

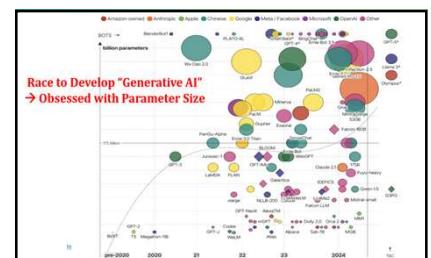
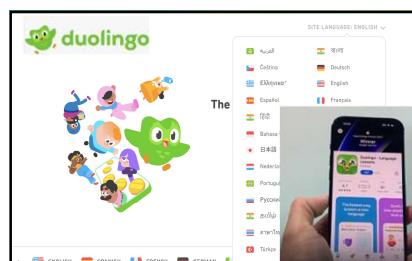
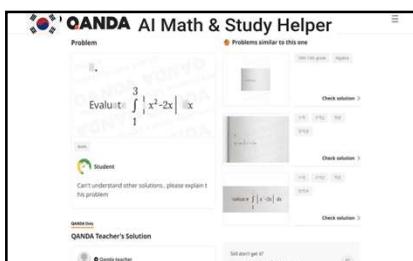
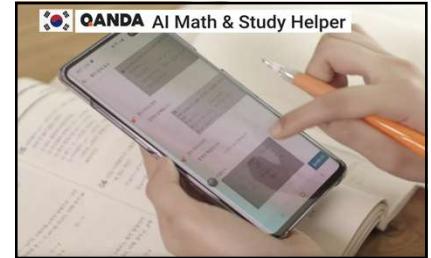
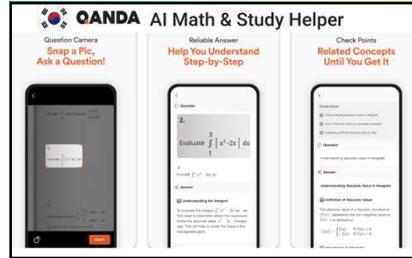
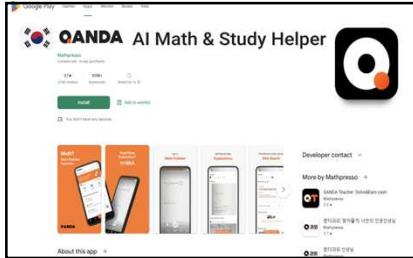
They need the same denominator

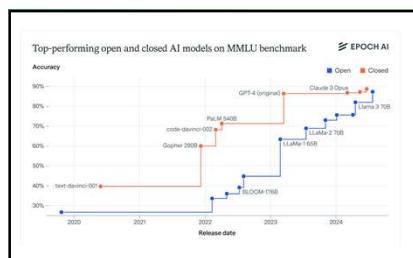
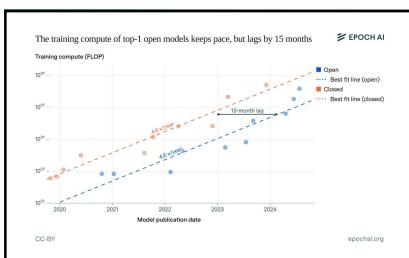
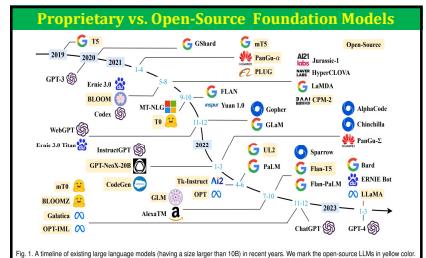
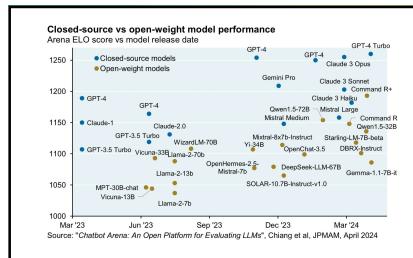
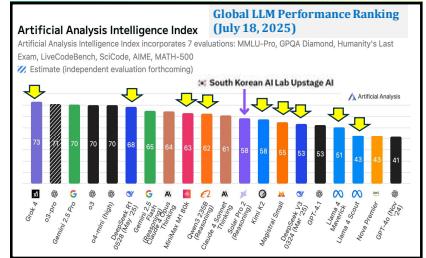
That's a good thought, but in this case, you don't need to find a common denominator because you're multiplying, not adding or subtracting. What else could you try?

Type message (do NOT share any personal data)

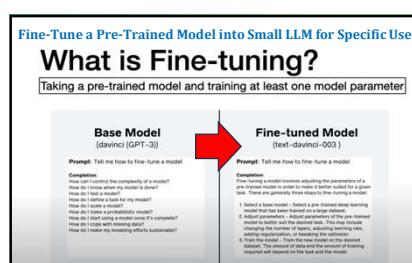
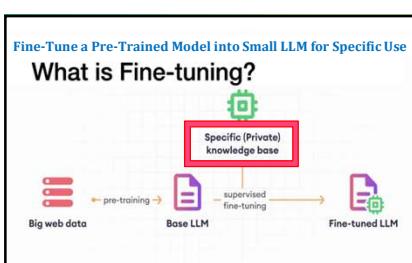
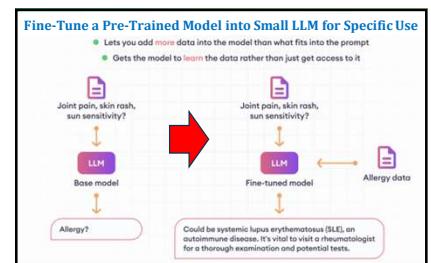
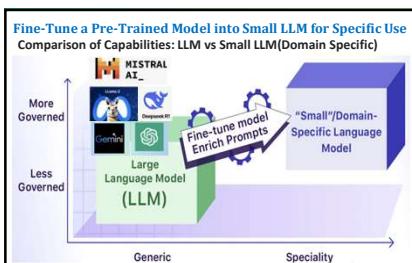
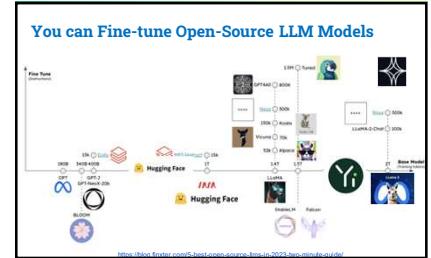
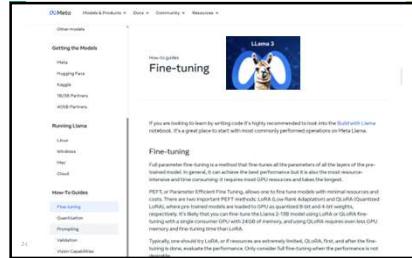
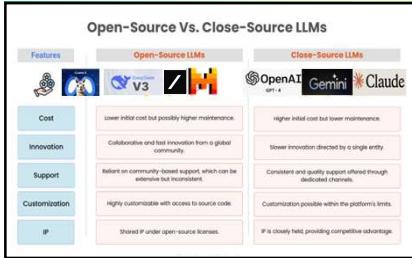
KHANMIGO by Khan Academy

AI-powered Math tutor (based on ChatGPT4)



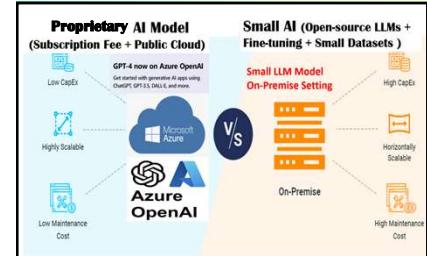


AI model development by domain approach			
Closed			
Public company	Market cap	Country	Strategic focus & notable activity
	\$3.79T	US	Focuses on AI research and AI hardware models (introduced June 2024) also released small Qwen-1 model family (April 2024)
	\$3.26T	US	Focuses on closed-source development with OpenAI partnership; released open Phi-3 small language models (April 2024)
	\$2.35T	US	Promotes closed Gemini model family while introducing lightweight open Gemini model family (February 2024)
	\$2.31T	US	Maintains closed Titán foundation models while supporting third-party models (January 2024)
	\$102.9B	China	Develops closed Turbot Foundation model (September 2024); released open Phi-3 small language model Hyperverse (December 2024)
Open			
Public company	Market cap	Country	Strategic focus & notable activity
	\$3.37T	US	Introduced open VLLM 1.0 multi-modal frontier-level LLM family (September 2024) also investing in closed-source model developers like Cohere and Qwen
	\$1.52T	US	Champions open-source AI and Llama model family as primary offering
	\$201.9B	China	Launched open Qwen-1 family (September 2024) while making large models available via API



Benefits of Using Open-Source LLMs after Fine-Tuning	
1. Enhanced data security and privacy	Using proprietary LLMs comes along with the risk of data leaks or unauthorized access to sensitive data by the LLM provider. By using open-source LLM, you are solely responsible for the protection of personal data and fully control of it.
2. Cost savings and reduced vendor dependency	Proprietary LLMs can be expensive. In the long term, this can be an important expense that small companies in Sub-Saharan countries may not be able to afford. This is not the case with open-source LLMs, as they are normally free to use. However, you will normally have to pay for the use of cloud services.
3. Code transparency and language model customization	Since open-source LLMs are accessible to everyone, including their source code, companies using them can customize them for their particular use cases.
4. Active community support and fostering innovation	The open-source movement promises to democratize the use and access of LLM and generative AI technologies. By lowering entry barriers to coders around the world

Feature/Aspect	Closed Weights LLM Models	Open Weights LLM Models
Definition	Model weights are not publicly available; must be API or hosted service only ➡ Data processed externally	Model weights are downloadable and can be run locally or on user infrastructure ➡ Models locally/private deployment
Customization	Limited amount of fine-tuning or modify the model directly.	Fast fine-tune, adapt, and deploy the model as needed
Performance Lag	State-of-the-art typically leads benchmarks by 5-22 months on benchmarks, but the gap is narrowing	Lags top closed models by 5-22 months on benchmarks, but the gap is narrowing
Training Compute	Uses the latest and largest compute resources	Largest open models lag by ~15 months in compute, but are catching up
Licensing	Proprietary: usage governed by provider's terms and pricing Closed: Only accessible via provider's platform/APi, per-per-use	Varies: ranges from highly permissive to restricted (e.g., non-commercial use)
Innovation & Collaboration	Limited to provider's ecosystem	Fosters community collaboration, experimentation, and research
Security & Privacy	Data processed externally; privacy depends on how the provider handles private deployment, enhancing privacy and control	Provider handles privacy and control
Example Models	OpenAI GPT-4, Anthropic Claude, Google Gemini	Meta Llama 3, Mistral, DeepText V2, Gemma Open Model

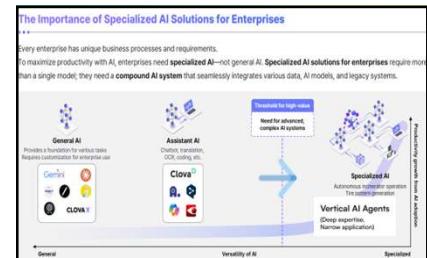
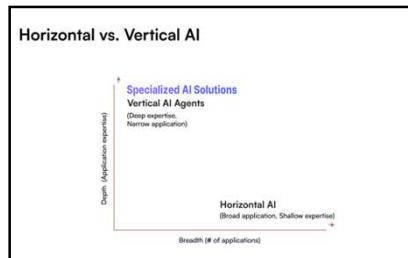


How Can AI Empower Entrepreneurs in Rwanda?

AI Innovation in Business Sector

9. Vertical AI (Special AI)

→ Domain-specific AI Solution



Attribute	Horizontal AI	Vertical AI Agents
Scope	Broad, cross-industry (e.g., GPT-4.5in)	Specialized by industry or workflow (e.g., Abridge for healthcare)
Data Depth	Unlimited domain-specific knowledge	Deep, fine-tuned domain knowledge
Adaptability	Moderate needs customization	High: adapts in real-time to industry dynamics
Workflow Automation	Partial	Full, from end-to-end
Compliance Alignment	General guidelines	Embedded sector-specific compliance (e.g., Basel II, HIPAA)
Human Intervention	Frequent (especially for nuanced tasks)	Minimal: human-in-the-loop only for exceptions

Why Vertical AI is gaining market attention ?

- Domain specialized Task Logic Integration:** Embed industry's legacy workflows and decision logic to support complex, role-specific tasks effectively.
- Precise Purpose Definition:** Designed specifically to address specific needs within particular industries. Compared to general-purpose AI, it achieves *more concrete results*.
- Seamless System Integration:** Seamlessly integrating Vertical AI with legacy systems, tools and processes
- Regulatory Compliance:** Design AI systems to meet strict industry regulations, critical in fields like healthcare, finance, and law.
- Targeted Distribution:** Use trusted industry channels and partnerships to reach users credibly

Abridge Clinician

Abridge: Generative AI for Clinical Conversations

The diagram shows three mobile phone screens demonstrating Abridge's AI features:

- Save hours a day on documentation with Abridge:** Shows a smartphone screen with a clean interface for medical documentation.
- Record patient-doctor conversations easily:** Shows a smartphone screen displaying a recorded audio conversation between a doctor and a patient.
- Get structured clinical notes in real-time with AI:** Shows a smartphone screen with a detailed clinical note generated by AI, including sections like "History Of Present Illness" and "Past Medical History".

Abridge Clinician

Abridge: Generative AI for Clinical Conversations

Abridge transforms patient-clinician conversations into contextually aware, clinically useful, billable AI-generated notes.

Get structured clinical notes in real-time with AI

Review and verify notes with Linked Evidence

Generate patient visit summaries in real-time

Summarize consultations across 50+ specialties and 14+ languages

Maximize Profits with Predictive AI

Exceed Your Business Potential
Maximize Profitability with High-Impact Enterprise Predictive AI

IMPACTIVE AI

Deepflow

DATA IMPORTING

DEEP FLOW AUTOMATION

USER INSIGHT

Using customers' data, Deep Flow build customized Prediction models

- Data Importing of client company's product transaction history
- Including key variables such as date, product ID, category, price, sales volume, etc.
- Execution of data standardization tasks for AI processing, including of data agents in Deep Flow
- Automation of modeling such as data preprocessing, feature engineering, model learning, etc. to build an optimal model as a prediction model of over 100 models
- AI prediction task: New product idea predictions, product life cycle management, inventory/production management, loss prediction, sales predictions, etc.
- Predictive insight result with user friendly interface and visualization
- Predictive product management
- Predictive sales UI
- Predictive inventory/production management UI

IMPACTIVE AI

Vertical AI in Manufacturing : Predicting Future Demand Volume

Accuracy
Up to 98.6% AI prediction accuracy rate.

Scalability
Portfolio of 224 enterprise-ready AI predictive models across multiple sectors.

Expertise
45 patent applications, led by an expert team of PhD researchers and professors.

MakinaRocks

Industrial LLM: Understanding the complexity of industrial world

Demand Forecasting, Production Optimization, Predictive Maintenance, Quality Control, Intelligent Control, Anomaly Detection, Autonomous Navigation

Conversation with AI

User asks AI to find the reason of increased defect rate on Production Line A.

AI analyzed that Line A has an issue with the 702-2L robot malfunction

MakinaRocks

Vertical AI in Manufacturing : Analyze Drawing

"AI Reviews Blueprint": Flagging Points that need Production Precautions in Manufacturing Process

MakinaRocks

Vertical AI in Manufacturing for Inspection

AI is Automatically Inspecting Components on Printed Circuit Boards (PCBs) in Manufacturing Process

Hippocratic AI

AI Agent Nurse : non-diagnostic, patient-facing applications

Hear our GenAI Healthcare Agents in Action

Fictional Patient Info: Rachel, 74, Female, Age: 74, Health History: Recently admitted to hospital 3 days ago following emergency appendectomy. Medication List: • Linzess, Domperidone

Spellbook

Draft and review contracts 10x faster, just like magic

The most complete legal AI suite for transactional lawyers

Book a Demo

AI and workflow ready to start using Spellbook!

• Book a demo now

• Get more info

• Request a demo

• Book a demo now

• Get more info

• Request a demo

Review Contract

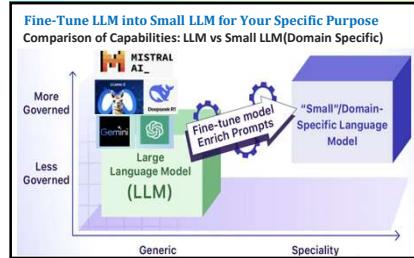
26 suggestions...

Tailored to Your Expertise

Deliver unique, fast & reliable language AI for your domain-specific professional needs.

Source Assured
Powered exclusively by industry experts whose expertise is rooted in their specific industry.

Multi-Source Support
An unique platform access to 100 documents, allowing users to search across multiple sources.



Which one would be more useful for Africa?

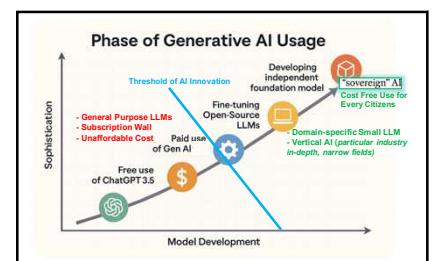
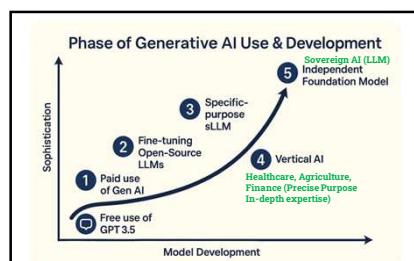
Machine Learning models with smaller datasets training are being applied for real-world tasks.

Machine Learning Deep Learning
Analytical AI
Traditional AI
Prediction, Recommendation

VS

Generative AI
Creation AI
Creation, Reinvention

Africa needs to overcome blind trust and subscription fee barriers to using general purpose proprietary Gen AI



How to Implement Your Idea into Action with AI /ML

- Identify existing chronic problems in your local community.
→ AI solutions should be designed specifically to address specific problems
- Build business case: Brainstorming ideas and solutions for the problem.
- You must collect highly relevant datasets in specific targeted fields
- AI/ML tools are openly available: Fine-tuning open-weight LLM models
- Seek a Partnership with AI/ML experts and Data scientists
- Develop your Vertical AI, highly specialized for the problem rather than relying on General Purpose LLM (ChatGPT, Google Gemini, Claude)
→ There is no ONE-SIZE-FITS-ALL Solution.
- Don't be afraid to change directions: Pivoting
- Fail fast and learn quickly. And Start again
- Renew your success formula → Then Repeat it