GLOBAL INNOVATION GATHERING

2024

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AI USES WITHIN GIG NETWORK

Introduction

Members of the Global Innovation Gathering (GIG) network are exploring artificial intelligence's potential to address critical issues across various sectors, including agriculture, education, health, and social justice. This report provides an overview of ongoing AI projects within the GIG network, highlighting the diverse applications, innovative strategies employed, and tangible impacts observed.

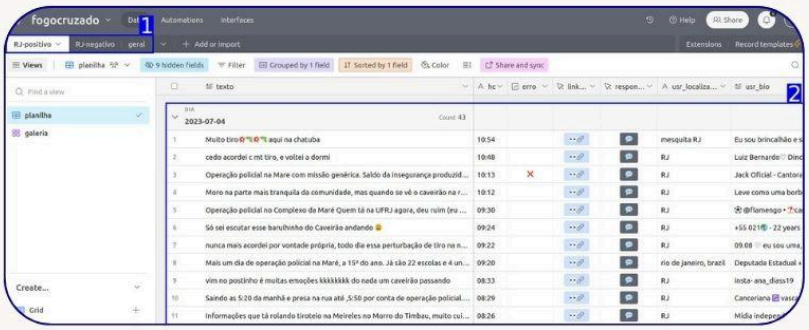
The report details the journey from conception through implementation, shedding light on the challenges encountered by GIG members and the adaptive solutions they have developed. It captures the varied aspects of these AI projects, including the rationale behind their inception, the steps taken to realize these concepts, and the obstacles overcome during implementations.

This document offers a comprehensive look at the early stages of AI integration within the GIG network, providing insights that can help inform and inspire continued exploration and development in the field.

Kairos AI

Kairos (Brazil)

Sector: Gender Equity and Social Justice.



Adriano Belisario is the founder and director of Kairos, a forward-thinking initiative aimed at advancing data literacy and crafting custom AI applications for civil society. These AI tools are designed to tackle a range of challenges from firearm event monitoring via social media to online misogyny detection and gender advocacy.

Tools and Technologies

This project utilizes Open-source Transformer Neural Networks for Natural Language Processing (NLP), a cutting-edge technology that plays a crucial role in understanding and generating human language.

Challenges and Solutions

This initiative faced significant challenges, particularly concerning the linguistics and resource limitations prevalent in the application of NLP technologies.

Impact, Benefits and Beneficiaries

Profound impacts on the communities and organizations this project serves has been achieved, particularly in enhancing their capabilities to tackle social issues through data-driven insights.

Future Outlooks

Continue expanding the scope and capabilities of Kairos's AI projects. The plans aim to solidify the project's role as a leader in leveraging AI for social good, ensuring that technology serves as a tool for empowerment and positive change.

Project Overview

Adriano Belisario, founder and director of Kairos, leads a forward-thinking initiative to advance data literacy and craft custom AI applications for civil society. Kairos develops open-source AI models tailored for media organizations, journalists, and nonprofits, enhancing their capacity to address complex social issues. These AI tools are designed to tackle various challenges, from firearm event monitoring via social media to online misogyny detection and gender advocacy.

The project has been instrumental in collaborations with Brazilian organizations, creating language models that cater to local needs and push NLP's boundaries to accommodate non-English languages. The impacts of these initiatives are profound, particularly for low-resource organizations that benefit from optimized and scaled processes. Adriano's efforts have garnered international recognition, with applications showcased by entities such as the British Council and the Re:publica Festival in Germany.

Kairos's dedication to open-source solutions and its focus on civil society applications underscore its unique position in leveraging AI to foster significant social change, particularly in areas impacted by the dominance of English in NLP resources and the lack of investments in non-profit AI applications in the Global South.

Tools and Technologies

Adriano's projects generally utilize **open-source Transformer neural networks for Natural Language Processing (NLP)**, a cutting-edge technology that plays a crucial role in understanding and generating human language. These tools are central to the project's ability to address complex social issues through AI:

- **Transformer Neural Networks**: These are highly flexible and powerful models that have revolutionized the field of NLP. They allow for the processing of data sequences (like sentences or longer texts) and are particularly effective for tasks that involve understanding context and generating text.
- **Application in Social Issues**: The neural networks are specifically adapted to monitor social media for signs of firearm events and gender-related issues, such as online misogyny. This adaptation involves training the models on relevant data sets that reflect these issues' specific linguistic and contextual nuances.

This technology enables Kairos to effectively scale their interventions, providing tools that help organizations not just react to social issues but proactively manage them through data-driven insights.

Challenges and Solutions

Adriano's initiative faced significant challenges, particularly concerning the linguistics and resource limitations prevalent in the application of NLP technologies:

- **Language Resource Gaps**: The dominance of English in NLP resources presents a major hurdle, as most preexisting models and datasets are primarily in English. This limits the applicability and effectiveness of AI tools in non-English-speaking regions.
- **Lack of Investment**: Non-profit AI applications often struggle to secure funding, especially those targeting civil society challenges in less economically developed regions. This lack of financial support impedes the development and scaling of innovative solutions.

Solutions Employed:

- **Custom Model Training**: Kairos has developed custom models specifically trained on locally relevant datasets to address the language resource gaps. This includes adapting models to understand and process Portuguese, mainly focusing on Brazilian Portuguese, to ensure the models are effective locally.
- **Open-Source Development**: By developing tools and models in an open-source environment, Kairos has bypassed some of the financial barriers associated with proprietary software. This approach reduces costs and encourages collaboration and knowledge sharing within the global AI community.
- **International Collaboration and Showcasing**: Gaining recognition through international platforms like the *British Council* and *re:publica Festival* in Berlin has helped raise the profile of Kairos's projects, attracting attention and potential funding sources.

These strategies have enabled Kairos to navigate these challenges and set a precedent for how AI can be adapted and implemented to effectively address specific local and social issues.

Impact and Benefits

Adriano Belisario's work through Kairos has had profound impacts on the communities and organizations it serves, particularly in enhancing their capabilities to tackle social issues through data-driven insights:

- **Optimization and Scaling of Processes**: By implementing AI-driven solutions, Kairos has enabled low-resource organizations, such as human rights groups and media outlets, to streamline and enhance their operational processes. This optimization has led to more efficient and effective data and resource management.
- **Increased Awareness and Proactive Interventions**: The AI tools developed by Kairos have been crucial in monitoring and analyzing social media for signs of firearm events and gender-related issues. This capability has allowed organizations to become more proactive rather than reactive, intervening swiftly and with better-informed strategies in potential crises.
- **Empowerment through Data Literacy**: One key benefit of the project has been promoting data literacy among civil society organizations. By providing tools and training, Kairos has empowered these organizations to leverage data in their advocacy and decision-making processes, ultimately leading to more impactful outcomes.
- **Recognition in the Future**: The international showcasing of Kairos's projects has validated their importance and influenced broader discussions about the role of AI in civil society. These discussions often lead to increased support and potentially new avenues for collaboration and funding.

Key Success Story: The model developed for Fogo Cruzado, a Brazilian Institute dedicated to monitoring violence, has been particularly impactful. Documented in a detailed paper, this model has significantly improved the institute's ability to track and respond to incidents of gun violence, demonstrating the tangible benefits of integrating AI into social initiatives.

Beneficiaries

Adriano Belisario's AI initiatives at Kairos primarily serve:

- **Human Rights Organizations**: These groups benefit from enhanced monitoring and reporting capabilities, particularly in areas like gun violence and gender-based discrimination. The AI tools enable these organizations to process vast amounts of data quickly and accurately, leading to better-informed strategies and interventions.

- **Journalists and Media Outlets**: by utilizing the language models developed by Kairos, journalists can analyze data and social media trends efficiently, which is crucial for investigative journalism and reporting on social issues.
- **Nonprofits**: the broader nonprofit sector, especially those in the global south, gains access to AI tools that are often out of reach due to cost or complexity. These tools allow them to leverage data in their operations and advocacy work, significantly enhancing their impact on the communities they serve.

The project's open-source approach also ensures that these benefits are accessible to various organizations, fostering a more inclusive and equitable field of AI application.

Future Outlooks

Adriano plans to continue expanding the scope and capabilities of Kairos's AI projects. Future initiatives include:

- **Future Development of Language Models**: Enhancing the accuracy and adaptability of the models to cover more languages and dialects, mainly focusing on underrepresented languages in the Global South.
- **Broader Collaborations**: Seeking partnerships with more organizations globally to extend the reach and impact of their AI tools, especially in areas with critical social issues.
- **Advanced Training Programs**: Offering more comprehensive data literacy and AI training programs to empower organizations and individuals to harness the full potential of AI in their work.

These plans aim to solidify Kairos's role as a leader in leveraging AI for social good, ensuring that technology serves as a tool for empowerment and positive change.

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Smart Agri-Box

H-FABLAB (Côte d'Ivoire)

Sector: Agriculture.

Smart Agri-box, is an agricultural tool designed for both greenhouses and open fields in Côte d'Ivoire. This system will smartly manage irrigation, lighting, and nutrients based on real-time environmental data collected through its sensors. It will also use AI to detect and deter birds from damaging crops by emitting predator sounds, enhancing crop protection efficiently.

Tools and Technologies

Smart Agri-Box is designed to utilize Environmental Sensors, AI-Driven Bird Deterrent and Seamless Technology Integraton, making it a tool for modernizing traditional farming methods as well as increasing crop yields and protection.

Challenges and Solutions

The challenges are choosing the right technologies, balancing innovation with cost, and diverse implementations. The solutions will overcome these barriers, ensuring sustainable integration into agricultural practices.

Impact, Benefits and Beneficiaries

The benefits of this project will be substantial, enhancing Farming Efficacy, Crop Protection, Resource Optimization, and more. Boosting productivity and sustainability for Farmers, the Agricultural Sector, Local Communities, and more.

Future Outlooks

The strategic vision is to expand and enhance the capabilities of the Smart Agri-Box through Technological Advancements, Expansion to Other Crops Regions, Integration with IoT and Educational Programs.

Project Overview

H-FABLAB leads the development of Smart Agri-box, a transformative agricultural tool designed for greenhouses and open fields in Côte d'Ivoire. This system smartly manages irrigation, lighting, and nutrients using real-time environmental data collected through its sensors.

Additionally, the Smart Agri-Box uses AI to detect and deter birds from damaging crops by emitting predator sounds, enhancing crop protection efficiently. Integrating AI into farming practices helps increase productivity and protect crops without excessive human intervention.

Tools and Technologies

Smart Agri-Box utilizes pioneering technologies to improve agricultural efficiency:

- **Environmental Sensors**: The system has advanced sensors that continuously monitor conditions like moisture, light, and nutrient levels. These sensors will provide the data necessary to adjust the environmental settings optimal for crop growth automatically.
- **AI-Driven Bird Deterrent**: Leveraging artificial intelligence, the Smart Agri-Box will identify birds that could harm crops. It will then activate a system that emits sounds mimicking natural predators to effectively scare away the birds, protecting the crops without chemical repellents.
- **Technology Integration**: While the specific tools are still being finalized, the focus is on selecting the best technological options that integrate seamlessly to provide a robust solution for various agricultural needs.

These technologies collectively enhance the Smart Agri-Box's functionality, making it a powerful tool for modernizing traditional farming methods, reducing labor, and increasing crop yields and protection.

Challenges and Solutions

Smart Agri-Box project's significant challenges:

- **Technological Selection**: One of the significant challenges is choosing the right technologies from a vast array of options that would integrate seamlessly and provide the most efficient and cost-effective solutions for varied agricultural environments.

- **Balancing Innovation with Cost**: Another critical challenge is incorporating progressive technology while managing costs to keep the Smart-Agri Box affordable for local farmers.
- **Implementing in Diverse Settings**: The system must be calibrated and customized to function effectively in greenhouses and open fields, each with its unique environmental conditions.

Solutions to Employ:

To address these challenges the H-FABLAB team is implementing several effective strategies

- **Thorough Technological Evaluation**: The team is conducting extensive research and testing to select the most suitable technologies that blend innovation with reliability and cost-effectiveness. This ensures that the Smart Agri-Box would be accessible to many farmers.
- **Cost Management**: The team will keep production costs low by optimizing the design and utilizing locally available materials where possible, making the Smart Agri-Box an affordable option for the intended users.
- **Customizable Settings**: The Smart Agri-Box is being designed flexibly, allowing for easy adjustments to suit the specific needs of different agricultural settings. This adaptability enhances its applicability across various farming environments.

These solutions will help overcome the initial barriers. They will also ensure that the Smart Agri-Box is sustainably implemented, leading to its successful integration into agricultural practices in Côte d'Ivoire.

Impact and Benefits

Smart Agri-Box will have a transformative effect on agriculture in Côte d'Ivoire, demonstrating substantial benefits across several areas:

- **Enhanced Farming Efficacy**: The Smart Agri-Box's automated management of irrigation, lighting, and nutrients will significantly improve farming efficiency. Farmers will be able to achieve optimal growing conditions without constant manual intervention, which is especially beneficial in rice cultivation, where precise environmental control is crucial.
- **Crop Protection**: By Incorporating an AI-driven system that deters birds using predator sounds, the Smart Agri-Box protects crops from potential damage, reducing losses and increasing overall yield. This innovative approach to pest control is environmentally friendly and avoids the use of harmful chemicals.

- **Resource Optimization**: The technology will ensure that resources like water and nutrients are used more efficiently, contributing to sustainable agricultural practices. This will not only save costs but also lessen farming's environmental impact.
- **Accessibility and Adaptability**: The Smart Agri-Box is designed to be adaptable to various agricultural settings, making advanced farming technologies accessible to a wider range of farmers, including those with little to no technical background.
- **Educational Impact**: The project will also have educational components. It will introduce local farmers to the benefits of integrating technology into traditional farming practices, helping to bridge the knowledge gap and foster a more technologically savvy farming community.

These impacts illustrate the Smart Agri-Box's role in modernizing agriculture in Côte d'Ivoire, making it a pivotal tool in boosting productivity and sustainability in the agricultural sector.

Beneficiaries

Smart Agri-Box primarily benefits several key groups:

- **Farmers**: The most direct beneficiaries are the farmers, especially those in rice production, who will use the Smart Agri-Box. It enhances their farming efficiency, increases crop yield, and reduces losses due to pests, directly impacting their productivity and income.
- **Agricultural Sector**: By promoting more efficient resource use and introducing sustainable farming practices, the Smart Agri-Box will benefit the broader agricultural sector in Côte d'Ivoire. It will serve as a model for how technology can be effectively integrated into traditional farming to improve outputs and sustainability.
- **Local Communities**: As agricultural productivity increases and farming becomes more sustainable, communities benefit from greater food security and economic stability. This improvement can lead to better overall health and prosperity for these communities.
- **Environmental Health**: By reducing the need for chemical pesticides and optimizing resource usage, the Smart Agri-Box contributes to the environmental health of farming areas. This reduction in chemical use will benefit local ecosystems and biodiversity.
- **Tech Innovators and Agritech Industry**: The project also supports the growth of the local agritech industry, providing a successful example of how

innovative technology can be adapted to meet specific agricultural needs. This success will encourage further innovation and investment in the sector.

Future Outlooks

The team at H-FABLAB has a strategic vision to expand and enhance the capabilities of the Smart Agri-Box:

- **Technological Advancements**: Plans are in place to continually upgrade the technology behind Smart Agri-Box. Future updates will include more precise sensors and AI algorithms to enhance the system's efficiency and effectiveness in crop management.
- **Expansion to Other Crops Regions**: While focused on rice fields, the team aims to adapt the Smart Agri-Box for use with other crops and expand its development to different agricultural regions in Côte d'Ivoire and beyond. This expansion will allow more farmers to benefit from the technology.
- **Integration with IoT**: The Smart Agri-Box is planned to be integrated with the broader Internet of Things (IoT) networks. This integration will enable more comprehensive data collection and analysis, leading to smarter farming solutions that can respond in real-time to environmental challenges.
- **Educational Programs**: H-FABLAB plans to increase its outreach through educational programs that train farmers on using Smart Agri-Box and other agritech innovations. These programs are intended to boost technological literacy and adoption among the farming community.
- **Partnerships and Collaboration**: A key feature focus is strategizing partnerships with agritech firms, educational institutions, and government agencies. These collaborations will support the project's scaling and foster an ecosystem that nurtures innovation in agriculture.

These forward-looking plans are designed to enhance the Smart Agri-Box's functionality and reach and solidify its role as a transformative tool in modern agriculture.

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Fluffy

Science Camp (Iraq)

Sector: Education.

Nawres Arif at Science Camp leads a project revolutionizing STEM education with "Fluffy," a Pokémon-inspired robot for Iraqi students. Fluffy will support English and Arabic learning with safe, offline, culturally relevant content, shifting education to a practical, engaging, and gamified experience. Using AI and machine learning, Fluffy will adapt its responses to the cultural context of Iraqi students, enhancing educational outcomes.

Tools and Technologies

Advanced AI will be used in the implementation "Fluffy" robot, including Machine Learning, Offline ChatGPT, and a Visual Programming Interface, to support educational goals and adapt to the needs of Iraqi students.

Challenges and Solutions

Challenges include Technological Integration, Cultural and Language Adaptation, and Cost Constraints. Innovative strategies ensure sustainable implementation and successful integration of Fluffy into Iraqi schools.

Impact, Benefits and Beneficiaries

Fluffy will enhance STEM education, showcasing AI's potential beyond traditional methods. Fluffy will enrich learning and supports educational reforms by integrating technology into daily classroom activities.

Future Outlooks

The Science Camp team plans to expand Fluffy's features, broaden language support, and increase production and distribution, aiming to make it a cornerstone of innovative education in Iraq and beyond.

Project Overview

Nawres Arif at Science camp leads an innovative project on revolutionizing STEM Education through interactive robotics. The centerpiece of this initiative is initially named “Fluffy,” a cute, cartoon-style educational robot inspired by popular animations like Pokémon. Designed to engage students in Iraq, Fluffy utilizes AI to enhance interactive learning by supporting English and Arabic language development and providing interactive educational content aligned with the Iraqi curriculum.

The project is in an advanced research and development stage, creating a production line for these AI-based robots tailored to local education needs. Fluffy is designed to be offline to ensure content relevance and safety, avoid controversial topics, and adapt to local cultural nuances.

The robot will teach and learn from interactions, enhancing its ability to support educational outcomes. By integrating elements of AI such as machine learning for behaviour modelling and an offline version of ChatGPT, Fluffy will interact, answer educational queries, and adapt its responses to fit Iraqi students' cultural and societal context.

Tools and Technologies

Fluffy utilizes advanced AI technologies to bring interactive educational experiences to life through this educational robot:

- **Machine Learning for Behavioural Modeling**: Fluffy will incorporate machine learning algorithms that enable it to exhibit behaviours that mimic emotional responses, enhancing its interaction with students. This technology would allow the robot to respond dynamically to student inputs, making learning sessions more engaging and responsive.
- **Offline version of ChatGPT**: An offline version of ChatGPT will be integrated to ensure the robot is suitable for the local educational context and independent of internet constraints. This adaptation would allow Fluffy to operate seamlessly in schools, providing reliable and consistent educational support without continuous internet access.
- **Visual Programming Interface**: The robot will be programmed using a visual programming interface, which will make it easier for educators and developers at Science Camp to update and customize its functionalities. This interface supports the robot’s ability to teach and adapt to the Iraqi curriculum, particularly in physics and other STEM subjects.

These technologies will not only empower the robot to support educational goals but will also ensure that it is accessible and adaptable to the specific needs of Iraqi students and the local schooling environment.

Challenges and Solutions

Nawres' project faced several challenges that needed innovative solutions:

- **Technological Integration**: Integrating advanced AI and Robotics into educational practices in Iraq presented challenges, especially in regions with limited technological infrastructure.
- **Cultural and Language Adaptation**: Creating a robot that teaches and adapts to the local language (Arabic and English) and cultural nuances required sophisticated customization of AI models.
- **Cost Constraints**: Balancing the high costs of advanced robotic technology with the need to make the educational tool accessible and affordable for schools in Iraq.

Solutions Employed:

- **Offline AI Capabilities**: By developing an offline version of ChatGPT, the team ensures Fluffy functions without needing continuous internet access, making it suitable for schools with unreliable internet connectivity.
- **Custom Model Training**: The AI models within Fluffy are being specially trained to understand and interact in both Arabic and English, incorporating cultural relevance and appropriate responses to fit the Iraqi educational and social context.
- **Educational and Community Engagement**: The team is conducting extensive community and societal studies to ensure that Fluffy is well-received by students and educators and aligns with local cultural expectations and educational standards.

These strategies will help overcome the initial challenges and ensure that the project is sustainably implemented, leading to the successful integration of Fluffy into Iraqi schools.

Impact and Benefits

Nawres' initiative at Science Camp, centered around the educational robot Fluffy, would make a significant contribution to STEM education:

- **Enhanced Student Engagement**: Fluffy will significantly increase engagement among children in STEM subjects. Its interactive and emotionally responsive features capture students' attention and make learning more

enjoyable and effective. This engagement is crucial in fostering a deep interest and understanding of STEM from a young age.

- **Improved Educational Outcomes**: Fluffy would help improve educational outcomes by providing tailored educational content and language support in Arabic and English. Students would be able to interact with the robot in their native language, which enhances comprehension and retention of complex STEM concepts.
- **Accessibility of STEM Education**: Fluffy will make STEM education more accessible and less intimidating for students. By gamifying learning processes, the robot helps demystify science and technology subjects, making them more approachable for all students, regardless of their previous exposure to STEM education.
- **Cultural and Linguistic Adaptation**: The project's focus on adapting AI to fit local cultural and educational standards is key to its success. This adaptation will ensure that the robot's interactions are culturally relevant and educationally appropriate, vital for acceptance and effectiveness in Iraqi schools.
- **Community and Educational System Support**: By introducing innovative teaching tools like Fluffy, broader educational systems in Iraq will be supported. Addressing the gap between theoretical knowledge and practical application, helping to modernize education and prepare students for future technological advancements.

These prospective impacts have the transformative potential of integrating AI-driven tools into education, particularly in settings that traditionally rely on more conversational teaching methods.

Beneficiaries

Fluffy is designed to make a significant impact on several groups:

- **Children and Students**: The primary beneficiaries are children and students interacting with Fluffy. The robot's function is to make STEM subjects more accessible and enjoyable, helping to foster a more profound interest in science, technology, engineering, and mathematics from an early age.
- **Tech Enthusiasts**: Tech Enthusiasts, including educators and hobbyists interested in integrating technology into education, would benefit from Fluffy's innovative use of AI and robotics. This group gains insights into practical applications of emerging technologies in educational settings.
- **Educational Institutions**: Schools and other educational institutions would benefit from incorporating Fluffy into their Curriculum. The robot is designed

to offer a new way of engaging students, supplementing traditional teaching methods and enriching what education provides.
- **The Broader Educational Community**: By showcasing effective gamification and interactive learning strategies, Fluffy will serve as a model that can inspire similar initiatives, potentially influencing educational practices regionally and globally.

Future Outlooks

Nawres Arif and the Science Camp team have ambitious plans for the future development of Fluffy and their educational initiatives:

- **Expansion of the Robot Features**: Future iterations of Fluffy will include more advanced AI capabilities, such as enhanced natural language processing and broader behavioural modelling. This will allow Fluffy to offer more personalized and responsive interactions with students.
- **Broader Language Support**: While currently focusing on Arabic and English, Fluffy's language capabilities will be expanded to include other regional languages. This will make the robot accessible to a wider audience and enhance its educational impact across different linguistic groups.
- **Increase Production and Distribution**: Science Camp aims to scale up the production of Fluffy to make it available to more schools across Iraq and potentially other countries in the region. This expansion will help more students benefit from interactive and engaging STEM education.
- **Integration into Curriculum**: Continued investment in research and development will focus on improving Fluffy's educational effectiveness and ensuring it remains at the cutting edge of academic technologies.
- **Community and Cultural Adaptation**: ongoing adaptations will ensure Fluffy remains culturally relevant and socially accepted, fostering positive interactions and educational outcomes.

These future plans are designed to build on Fluffy's current successes and transform it into a cornerstone of innovative educational practices that can be adopted widely within Iraq and beyond.

Contact Information

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Pay Later

Hagush (USA)

Sector: Agriculture.

Collaborating with ***FarmIT*** an agritech startup in **Kenya**, Hagush's AI project builds the technological capacity needed to enable AI-powered applications to revolutionize farming practices in Africa. By addressing the key barriers of technology access and affordability, Nadait's work ensures that technological advancements are inclusive and beneficial to those traditionally left behind in the digital divide.

Tools and Technologies

This project incorporates a combination of satellite imagery analysis and mobile technology, illustrating a practical application of AI and making advanced data analytics accessible to smallholder farmers.

Challenges and Solutions

Due to the technological gaps and economic barriers common in rural Africa, this project had to come up with strategies to overcome those barriers as well as foster a more inclusive and technologically enabled agricultural community.

Impact, Benefits and Beneficiaries

The impact of this project is looking to extend beyond individual farmers, influencing the entire agricultural value chain and demonstrating the transformative potential of integrating AI technology in traditionally low-tech environments.

Future Outlooks

Future initiatives reflect a commitment to not only maintain but also enhance the transformative impact of the project, ensuring that it continues to serve as a beacon of innovation and support for the agricultural community in Africa.

Project Overview

Nadait Gebremedhen leads a pioneering initiative at Hagush that bridges the gap between advanced technology and practical agricultural needs in Africa. Collaborating with **FarmIT**, an agritech startup in **Kenya**, Hagush's project builds the technological capacity to enable AI-powered applications to revolutionize farming practices. The core of this initiative is a sophisticated app that utilizes satellite imagery to provide smallholder farmers with critical insights about their soil health and crop conditions. This technology enables farmers to make informed decisions that significantly boost productivity and output.

The project's approach involves providing farmers with smartphones, which are essential tools for accessing the AI app. This intervention introduces farmers to digital technology and empowers them to enhance their agricultural practices through data-driven insights. FarmIT's app, supported by Hagush's technology financing program for smartphones, exemplifies how integrating AI with practical applications can substantially improve agricultural productivity and sustainability.

By addressing the key barriers to technology access and affordability, Nadait's work ensures that technological advancements are inclusive and beneficial to those traditionally left behind in the digital divide. This project is not just about technological implementation but also about creating a sustainable model that supports continuous growth and development in the agricultural sector of the Global South.

Tools and Technologies

Nadait Gebremedhen's project at Hagush incorporates cutting-edge AI technologies to drive agricultural advancements:

- **AI-Powered App with Satellite Imagery Analysis**: This app is the technological cornerstone of the project. It uses advanced algorithms to analyze satellite data. It processes imagery to extract vital information about soil health, crop vitality, and overall farm conditions. This analysis enables farmers to optimize agricultural practices based on precise, real-time field data.

- **Smartphones as Access Points**: Hagush facilitates access to the AI app by equipping farmers with smartphones. These devices are essential for farmers to utilize the full capabilities of AI technology, transforming them into powerful tools for development.

This combination of satellite imagery analysis and mobile technology illustrates a practical application of AI, making advanced data analytics accessible to smallholder farmers. These tools enhance agricultural output and democratize technology access, ensuring that the benefits of AI reach those who are most in need.

Challenges and Solutions

Nadait's project set out to bridge the existing technological gaps and economic barriers in Sub-Saharan Africa:

- **Digital Divide**: The project aimed to bridge the digital divide from the outset. The initiative was conceived with the understanding that farmers' access to digital technologies like smartphones was limited, which is crucial for utilizing AI-powered agricultural tools. By focusing on making these devices more accessible, the project was strategically positioned to enhance outreach and implementation efforts effectively.
- **Affordability of Technology**: Recognizing the prohibitively high cost of digital devices in many parts of Africa, the project prioritized making technology affordable for smallholder farmers. This effort was integral to the project's strategy, ensuring farmers could access the necessary technology, like the AI app, to improve their agricultural practices. Collaboration with the partner startup was key in enabling their work and facilitating broader access to these essential tools.
- **Integration of AI in Organizational Processes**: Incorporating AI more comprehensively into the organization's daily operations was a strategic and operational challenge, requiring careful planning and adjustment.

Solutions Employed:

- **Smartphone Distribution and Financing Program**: Hagush introduced a financing program that provides smartphones to farmers with no upfront cost and an extended, interest-free payback period. This initiative has been crucial in bridging the digital divide and enabling farmers to access AI tools.
- **Supply Chain Optimization**: By improving the efficiency of supply chains, Hagush has reduced the costs of the devices it procures for farmers, addressing the issue of affordability and ensuring sustainable access to the necessary technology.
- **Educational Initiatives and Training**: To facilitate the integration of AI into agricultural practices, Hagush has developed training programs to enhance farmers' digital literacy. These programs ensure farmers can effectively utilize AI applications to improve their farm output and sustainability.

These strategies will help overcome initial barriers and foster a more inclusive and technologically enabled agricultural community, setting a model for how AI can be integrated to tackle significant developmental challenges in the Global South.

Impact and Benefits

Nadait Gebremedhen's project at Hagush will launch in August 2024 with 100 farmers looking to make a substantial impact on the agricultural sector in Africa, demonstrating tangible benefits to smallholder farmers and the broader farming community:

- **Enhanced Agricultural Productivity**: The introduction of AI-powered tools that analyze satellite imagery will significantly improve farmers' decision-making capabilities (updates on this will be provided after launch). By providing detailed insights into soil health and crop conditions, the app enables farmers to optimize their farming practices, increasing agricultural output by 15-20%.
- **Economic Empowerment**: By facilitating access to smartphones and the necessary AI tools, Nadait's initiative will directly increase farmers' incomes. This economic uplift is from higher yields and the ability to make more informed and timely decisions that affect crop sales and market timing.
- **Digital Inclusion**: The project will play a crucial role in bridging the digital divide in rural Africa. The initiative will foster a more inclusive digital environment where technology serves as a lever for economic development by equipping farmers with smartphones and training them to use advanced AI applications.
- **Sustainable Development**: Beyond immediate agricultural benefits, the project promotes sustainable farming practices by enabling farmers to use resources more efficiently and reduce waste. This approach contributes to broader environmental sustainability goals, aligning with global efforts to combat climate change and preserve natural resources.

The impact of this project extends beyond individual farmers. It influences the entire agricultural value chain and demonstrates the transformative potential of integrating AI technology in traditionally low-tech environments.

Beneficiaries

Nadait's initiative primarily supports two key groups within the agricultural sector:

- **Smallholder Farmers**: The project's direct beneficiaries are the smallholder farmers, who receive smartphones and access to the AI-powered app. These tools provide them with critical insights about their farms, such as soil health and crop conditions, essential for improving their agricultural practices and outputs. The enhanced productivity from these insights significantly increases their income, thereby improving their livelihoods.
- **Agritech Startups**: The project also partners with local agritech startups to support their growth and development. The collaboration helps these startups refine their products and expand their reach, ultimately increasing their impact on the agricultural sector. The project provides the necessary technology to farmers and validates and promotes the startups' innovative solutions, contributing to the overall growth of the agrarian technology ecosystem in Africa.

Beyond these primary groups, the project indirectly benefits the broader community by promoting sustainable agricultural practices and economic development. By increasing farm productivity and promoting digital inclusion, the initiative contributes to the region's wider food security and financial stability goals.

Future Outlooks

Nadait and her team at Hagush are committed to expanding the scope and scale of their innovative AI project further to enhance its impact on the agricultural sector in Africa:

- **Scaling Up Technology Access**: One of the primary goals is to expand the smartphone distribution and financing program to include more farmers across different regions of Africa. By increasing access to digital technology, the project aims to empower many smallholder farmers with AI-driven agricultural insights.
- **Enhancing AI Capabilities**: The project plans to continuously improve the AI application by integrating more advanced features. The enhancements will provide farmers with even more precise and timely insights, helping them anticipate weather conditions, pest infestations, and crop diseases.
- **Broadening Partnerships**: Hagush intends to form partnerships with more tech/AI solution providers that require users to have access to digital technology. These collaborations will help to diversify the technological solutions offered and ensure that the latest innovations reach the farmers who need them most.
- **Promoting Sustainable Practices**: As the project evolves, there will be a stronger emphasis on promoting sustainable farming practices through the AI application. This will involve providing farmers with information and

recommendations on reducing resource usage and environmental impact, aligning with global sustainability goals.
- **Financial Accessibility Programs**: Hagush plans to develop its financing models further to make the technology even more affordable for farmers. By enhancing its financing options, Hagush aims to remove economic barriers and make digital tools universally accessible, fostering greater economic equality.

These future initiatives reflect a commitment to maintaining and enhancing the project's transformative impact, ensuring that it continues to serve as a beacon of innovation and support for the African agricultural community.

Contact Information

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Wondernauts

Imagination Research and Innovation Inc. (Philippines)

Sector: Education.

Rosanna Lopez, Founder and CEO of Imagination Inc., scales educational innovations in the global South using play and human-centered design. With CTO Deepak Chotrani, she created "Wondernauts," a platform using Gen AI, gaming, and extended reality to foster lifelong learning and equip youth with essential skills. Wondernauts makes education accessible, encouraging curiosity, creativity, and critical thinking.

Tools and Technologies

The backbone of the Wondernauts platform, are tools such as Adaptive Learning Algorithms, Generative AI and AR making it a captivating and adaptive learning environment encouraging children to explore and learn in innovative ways.

Challenges and Solutions

Currently, prototypes for several use cases are available and fundraising for the MVP. Once funds are raised, Deepak and Rosanna will focus on Sophisticated Algorithm Design, Comprehensive Tech Integration, Economic Scaling, and Partnerships.

Impact, Benefits and Beneficiaries

This project will enhances learning engagement, improves outcomes, broadens access to progressive education, supports diverse needs, and involves communities and parents, transforming education into an enjoyable part of daily life.

Future Outlooks

Rosanna and Deepak plan to expand and enhance Wondernauts, aiming to solidify its position as a leader in educational innovation, making learning more interactive, enjoyable, and effective for students worldwide.

Project Overview

Rosanna Lopez is the Founder and CEO of Imagination Inc., a creative lab whose mission is to use the principles of play and human-centered design to scale educational innovations in the global South that positively impact children's lives. Together with CTO Deepak Chotrani, Rosanna is building ”Wondernauts”, a platform that leverages Gen AI, gaming and extended reality to foster a desire for lifelong learning among young people and equip them with the skills they need to thrive in a rapidly changing world.

Wondernauts addresses key challenges in the education and youth workforce development sectors by making progressive education accessible at scale and at low cost. The platform encourages curiosity, creativity, and critical thinking by blending digital interactions with real-world exploration and creating engaging, relevant, and fun learning.

Tools and Technologies

Wondernauts integrates several advanced technologies to enhance learning experiences:

- **Adaptive Learning Algorithms**: These algorithms tailor educational content in real-time to each student’s unique interests, learning style, and pace, ensuring that learning is compelling, engaging, and developmentally appropriate for every learner.
- **Generative AI**: This technology generates dynamic and interactive content that inspires learners, fuels their curiosity, answers questions (and raises some of its own) and provides prompts that challenge students to think critically and creatively.
- **Augmented Reality (AR)**: AR technology merges digital learning with the physical world, providing immersive experiences that make education fun and informative. This approach allows students to explore new concepts through interactive, real-world adventures.

These tools form the backbone of the Wondernauts platform, creating a captivating and adaptive learning environment that encourages children to explore and learn innovatively.

Challenges and Solutions

Currently, prototypes for several use cases are available, and Wondernauts is fundraising to develop an MVP.

Solutions to Employ:

Deepak and Rosanna will engage in the following key activities once funds are raised:

- **Sophisticated Algorithm Design**: Wondernauts uses advanced adaptive learning algorithms that adjust the difficulty and style of content based on real-time feedback from user interactions. This dynamic approach ensures that each child receives a personalized learning experience.
- **Comprehensive Tech Integration**: A multi-disciplinary approach will be applied, combining expertise in AI, AR, and educational theory to create a seamless and engaging academic environment. This integration will enhance the learning experience and ensure that the technology is intuitive and easy to use.
- **Economic Scaling and Partnerships**: The team works to reduce costs and increase accessibility through strategic partnerships with educational institutions and technology firms. Additionally, the Wondernauts platform will offer various pricing models to ensure that more families and educators can afford the innovative learning tool.

Impact and Benefits

The Wondernauts project will make a profound impact on the educational landscape, demonstrating several significant benefits:

- **Enhanced Learning Engagement**: Wondernauts significantly increased engagement among children by leveraging adaptive learning algorithms and interactive AR experiences. These technologies make learning more dynamic and fun, encouraging students to spend more time on educational activities.
- **Improved Educational Outcomes**: Wondernauts' personalized learning approach helps improve educational outcomes. Children receive content tailored to their learning pace and style, which enhances their understanding and retention of complex subjects.
- **Broadened Access to Progressive Education**: Wondernauts has made progressive educational methods, which often emphasize creativity and critical thinking over rote learning, more accessible to a broader audience. This access helps bridge the gap between traditional educational systems and modern educational needs.
- **Support for Diverse Learning Needs**: The platform is designed to cater to various learning styles and abilities, making it a valuable tool for inclusive education. This inclusivity ensures that all children can benefit from

high-quality educational content regardless of their learning preferences or challenges.
- **Community and Parental Involvement**: Wondernauts encourages greater parental involvement in their children's learning processes by providing an engaging and educational platform that parents can trust. Additionally, it serves as a resource for community spaces like libraries and museums to support lifelong learning.

These impacts highlight Wondernauts' role in transforming children's engagement with education, making learning a continuous, enjoyable, and integrated part of their daily lives.

Beneficiaries

The Wondernauts project is designed to impact a diverse group of beneficiaries, significantly enhancing their educational experiences:

- **Children and Students**: The primary beneficiaries are children aged 8 and up who experience a more engaging and personalized learning environment. The platform helps these young learners develop critical thinking, creativity, and problem-solving skills through interactive and fun educational content.
- **Families**: Parents and Families benefit as the platform provides a safe and productive way for children to engage with technology. Wondernauts supports educational growth outside the traditional classroom settings, helping parents ensure that their children receive a comprehensive education at home.
- **Museums and Public Spaces**: These entities use Wondernauts to create interactive and educational experiences that attract and educate visitors, especially your people, making learning an integral part of community engagement.
- **EdTech Community**: Educators and technology developers gain insights into effective ways of integrating AI and AR into education, promoting innovation and adopting new teaching tools within the educational technology sector.

These are the direct and indirect beneficiaries of the Wondernauts project, showcasing its wide-reaching impact on enhancing educational practices and promoting active learning.

Future Outlooks

Looking ahead, Rosanna and Deepak have ambitious plans to expand and enhance the capabilities of the Wondernauts platform:

- **Technological Enhancements**: The team plans to further develop Wondernauts' AI and AR features, introducing more advanced functionalities that can adapt even more effectively to individual learning styles and preferences. This includes integrating newer AI models that can anticipate student needs and adapt learning paths in real-time.
- **Expansion of Content and Languages**: Wondernauts aims to broaden its curriculum to cover a wider range of subjects and include multiple languages. This expansion will make the platform accessible to a global audience, supporting more diverse educational needs.
- **Partnerships with Educational Bodies**: Wondernauts intends to integrate its platform into mainstream curricula by forming partnerships with schools, educational authorities, and international educational organizations, enhancing its reach and impact.
- **Increased Community and Museum Collaborations**: The project plans to expand its collaborations with museums and community centers to create more interactive and educationally enriching public learning experiences.
- **Scaling to New Markets**: Wondernauts is set to scale its operations to new geographical markets, focusing on regions where educational technology can significantly impact learning outcomes and engagement.

These initiatives aim to solidify Wondernauts' position as a leader in educational innovation, making learning more interactive, enjoyable, and effective for students worldwide.

Contact Information

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