



# Resilient Education Information Infrastructure for the New Normal

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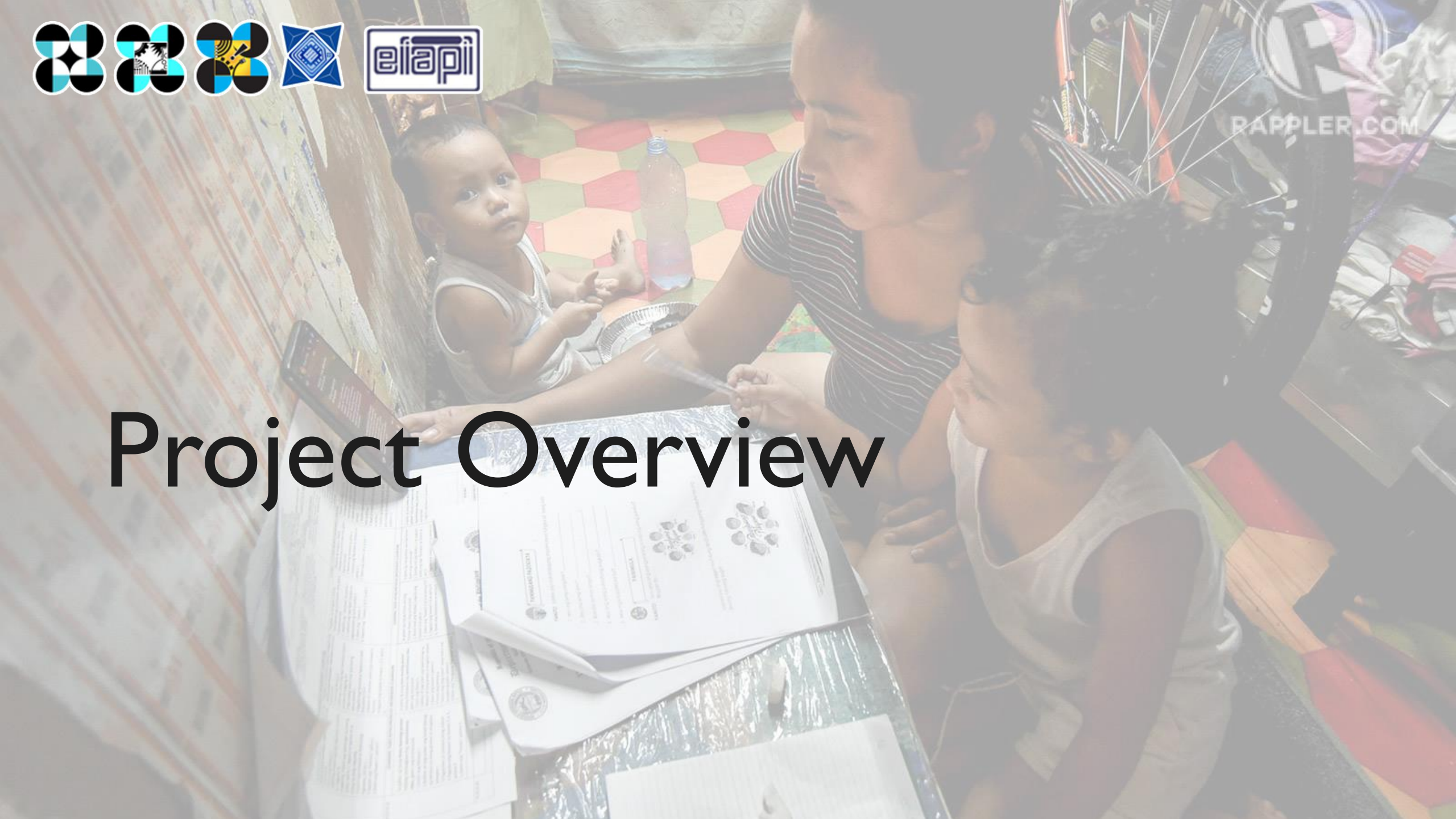
# In this Presentation....

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- Pilot Sites
- Implementation Challenges



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# Project Overview







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# Shift to remote and/or online learning

The COVID-19 pandemic has forced the Philippine educational system to shift from traditional to remote and/or online learning paradigm.



# Key barriers to online learning

The lack of quality, reliable, sustainable, and resilient ICT infrastructure remains as the top challenge in the implementation of remote learning in the Philippines.



# Problem

Difficulties in educational content transmission in remote learning due to the unreliable internet connection in the Philippines





# Challenge

Develop innovative solutions utilizing UHF TV channels to provide internet connectivity to support remote education in the Philippines





# REINN

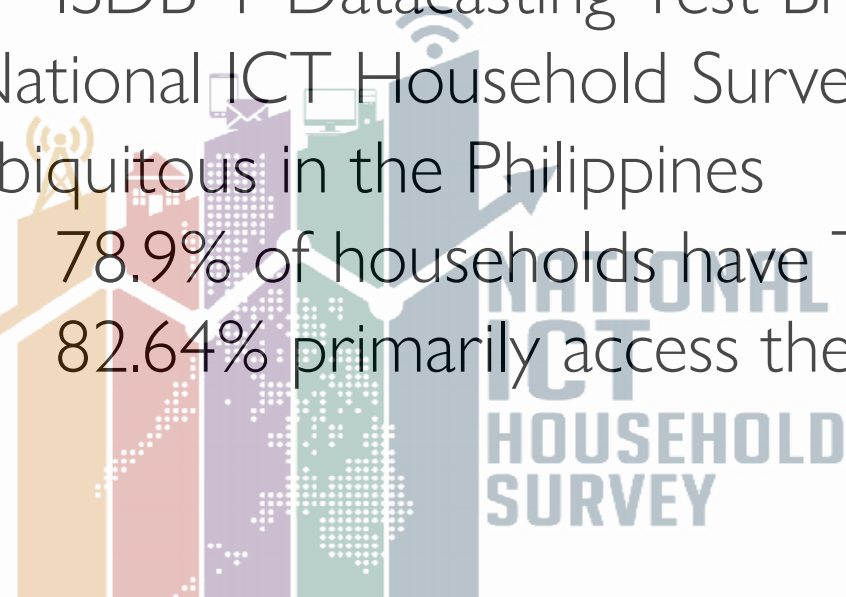
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The focus of the project is to develop innovative solutions utilizing UHF TV channels to support remote education and to provide internet connectivity since face-to-face classes still limited in the Philippines.



# Why UHF TV Frequencies?

- The Philippines has yet to fully shift from Analog to Digital TV (2023)
- Opportunity to champion for alternative use of to-be vacated spectrum,
  - 600 MHz for both LTE/NR Band 71, Community Networks
  - ISDB-T Datacasting Test Broadcast
- National ICT Household Survey (2019): TV and Smartphones are almost ubiquitous in the Philippines
  - 78.9% of households have TV, 40.9% within reach of Digital TV
  - 82.64% primarily access the internet through smartphones



# REINN Technology Demonstrators



## LokaLTE

Develop a low-cost, small-scale LTE base station that aims to address the lack of internet access in remote and unserved areas in the country



## RuralCasting

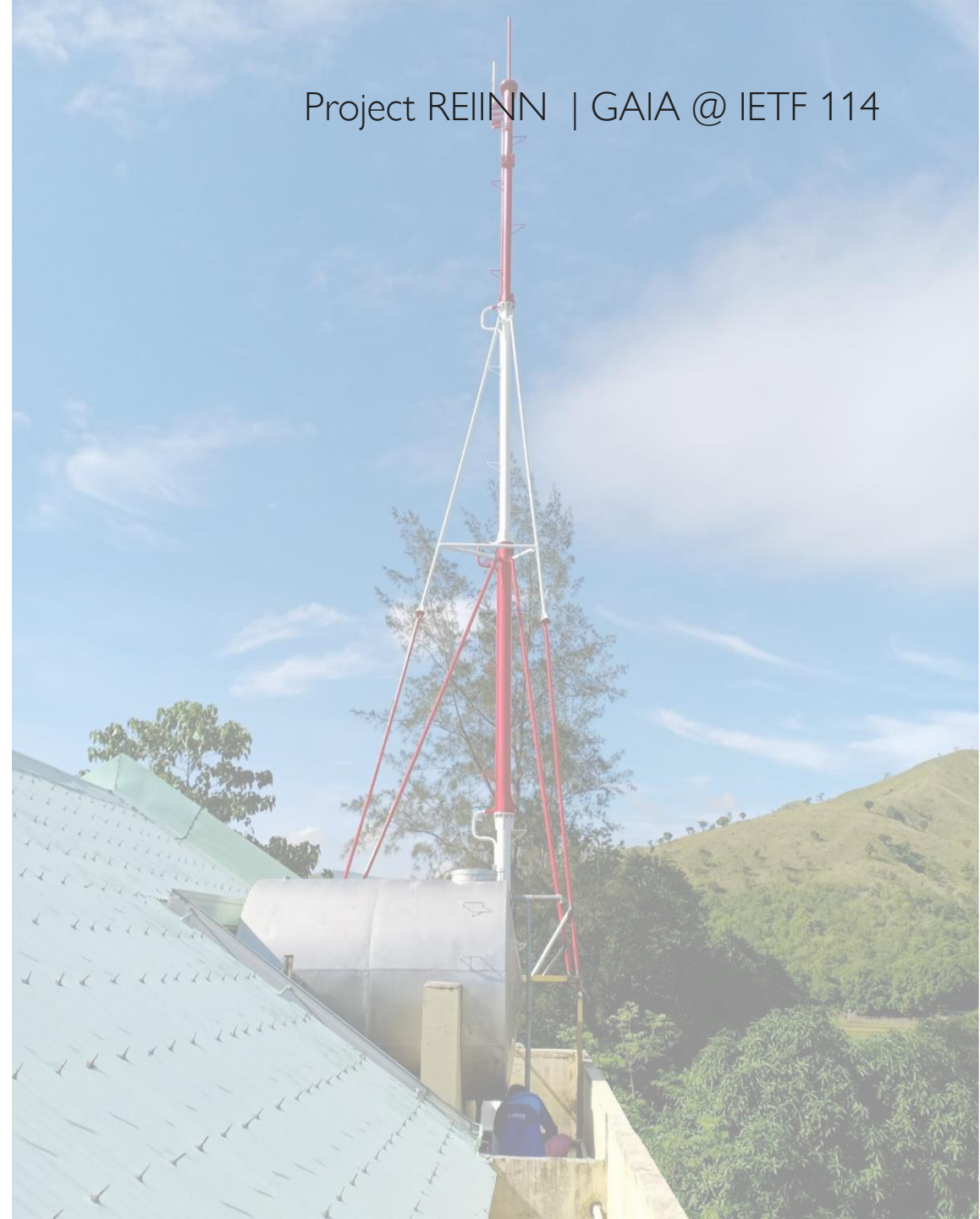
Utilize the datacasting feature of the Integrated Services Digital Broadcasting-Terrestrial (ISDB-T) to deliver educational digital content



# LokaLTE: Goal

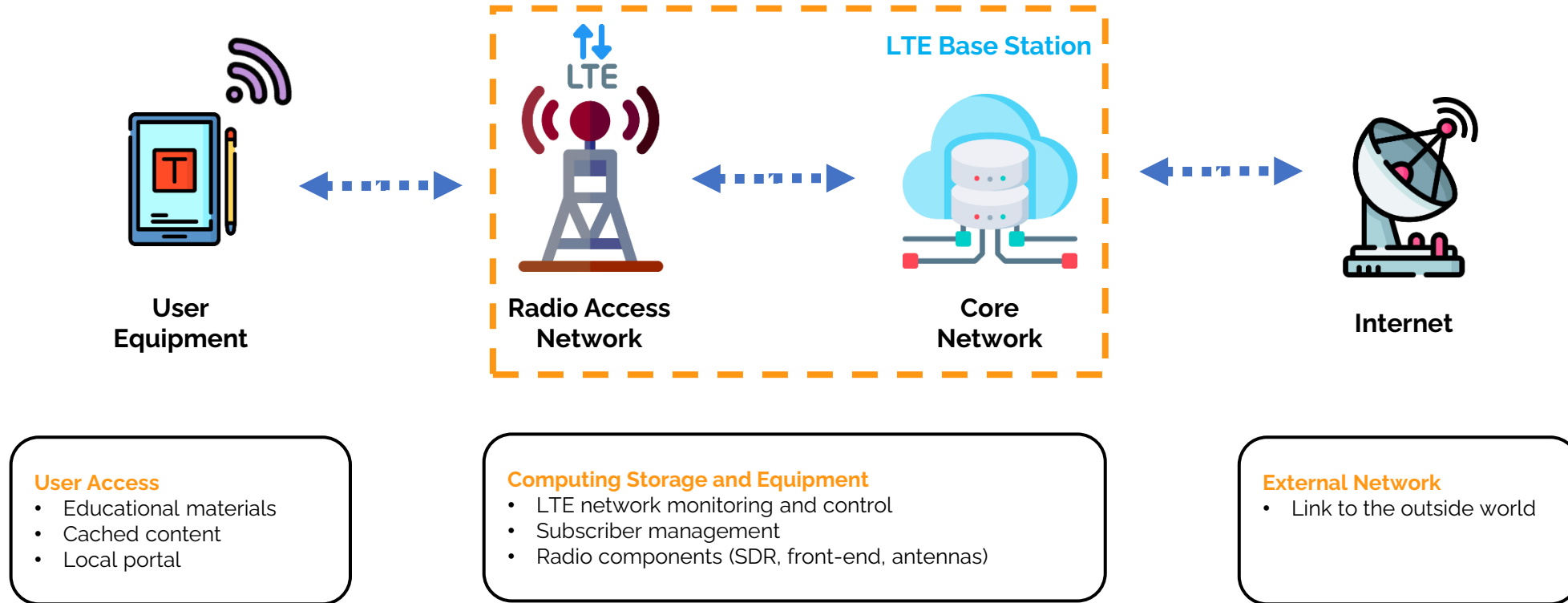
Local development and deployment of community LTE Networks in the Philippines

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# LokaLTE: System Overview



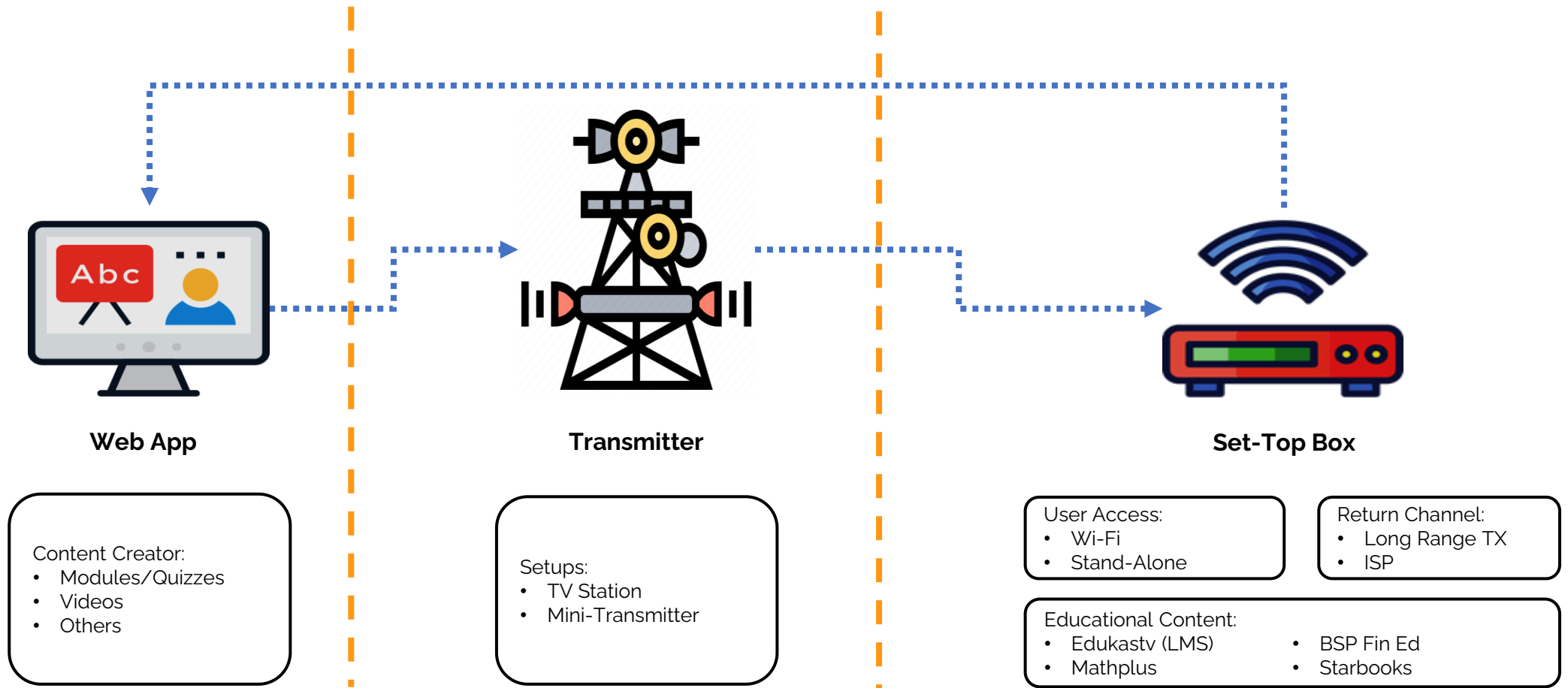


# RuralCasting: Goal

Utilizing datacasting technology to supplement the educational experience of the students



# RuralCasting: System Overview







# Social Impacts



# Economic Impacts

1 ADDITIONAL  
REVENUE



2 ELIMINATE  
MARKET BARRIERS



3 MAXIMIZE  
MARKET YIELDS



4 ATTRACT  
INVESTORS



5 BREED  
INNOVATION



6 EDUCATED  
WORKFORCE





# Pilot Sites







# Pilot Sites Criteria

- Absence of commercial mobile phone service/signal
- School is not more than 500 meters away from a community with at least 50 households
- School officials and members of the community are willing to participate and cooperate in the project
- No ongoing armed conflict

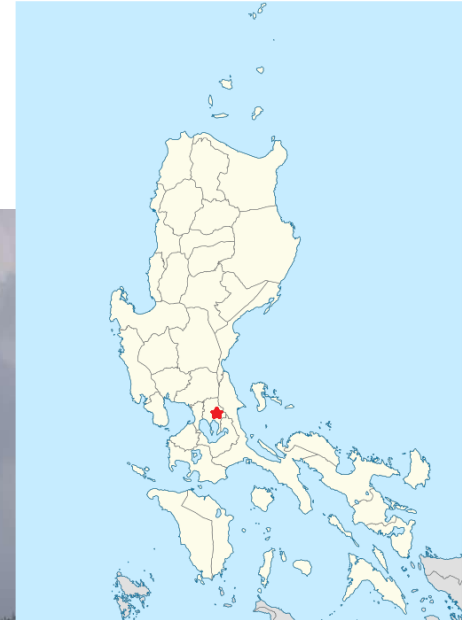


# Pilot Sites Criteria

- Availability of passable roads
- Preferably with stable and reliable electric power from the local utility
- Has an open space area to host our LokaLTE cell site (either of the following):
  - Ground space of at least 8m x 8m, preferably away from other infrastructures
  - Building rooftop space

# San Andres, Tanay, Rizal

- Surrounded by dense residential area (population of 1,454 in 2020)
- Has an available land for the LTE tower
- Has accessible location for setting up transmitters





# Madilay-dilay, Tanay, Rizal

- Surrounded by dense residential area (population of 2,806 in 2020)
- Pilot site for RuralCasting





# Looc, Castillejos, Zambales

- Surrounded by dense residential area (population of 1,967 in 2020)
- Has an rooftop for the LTE tower
- Has accessible location for setting up transmitters





# Pilot Sites Crowdsourcing

- Target of six (6) pilot communities, nomination through data crowdsourcing







*Conduct of Spectrum Measurement in Brgy. Kalawakan, DRT, Bulacan, and Dike Elementary School, Norzagaray, Bulacan*





Setting up of Prototype LTE Base Station in San Andres Elementary School, Tanay, Rizal (left) and Bayabas, DRT, Bulacan (right)





*Demonstration of REINN Technology to the teachers and residents of Bayabas, DRT, Bulacan (left) and San Andres, Tanay, Rizal (right)*





*Conduct of Technology Demonstration in San Andres, Tanay, Rizal and Looc, Castillejos, Zambales*





*Groundbreaking Activity in San Andres, Tanay, Rizal and Looc, Castillejos, Zambales*





*Tower Construction in San Andres, Tanay, Rizal and Looc, Castillejos, Zambales*





# Implementation Challenges

- Currently in talks with regulator for limited permits in the select pilot areas
  - Policy for Government Entities performing quasi-telco functions.
- Restricted ability to import LTE Band 71 COTS Radios and End-user devices.
- Apparent Redundancy with Free Wi-Fi for All – Public Internet Access Program
  - Sustainable Operational Model for Community Buy-in / Participative Networks vs. Free/Subsidized.





Thank You!



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