Securing the Future of Rural Finance: 5G UPI Solutions with Blockchain and Advanced Network Functions

Developing a UPI prototype and deploying AUSF/PCF for secure slice operations, enabling secure financial transactions and minimizing cyber-attacks.

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GMMS Labs

The Objective of 5G Model Village

- **Enhance Connectivity:** Provide reliable 5G connectivity to rural areas.
- **Boost Financial Inclusion:** Enable secure and efficient financial transactions via advanced UPI integration.
- **Support Economic Growth:** Facilitate digital transformation in agriculture, education, healthcare, and governance.
- **Pilot Innovative Solutions:** Test and refine 5G applications in real-world scenarios.

Villages Chosen for the Project

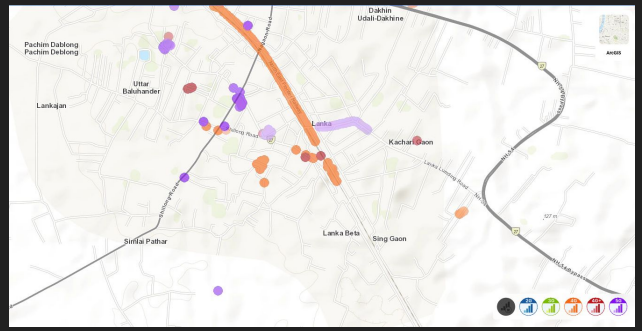
- Dablong, Dist Nagaon , Assam

Is the only village that has been chosen for this project.

Preliminary Investigations

- Proven usage of libraries, tools and development in Zero Knowledge Proofs and Smart Contracts
- Proven research of telecom and network industry
- Academic expertise for 5G, Telecom, Blockchain and Security

Signal Strength:



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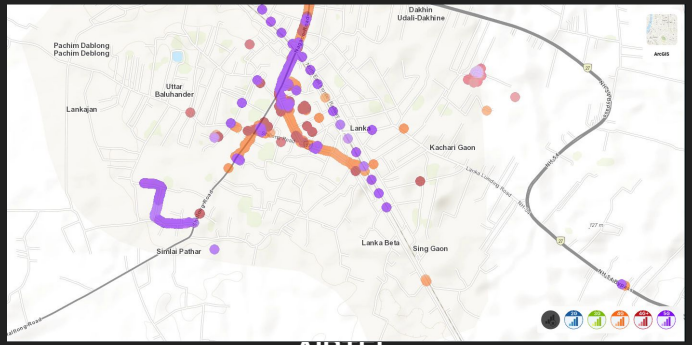

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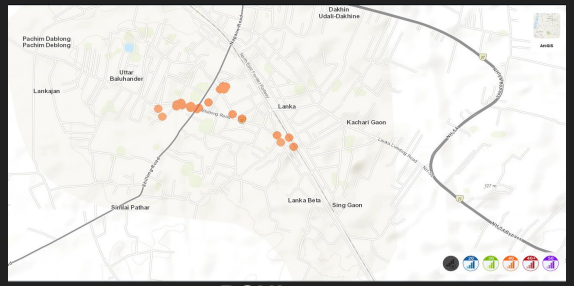

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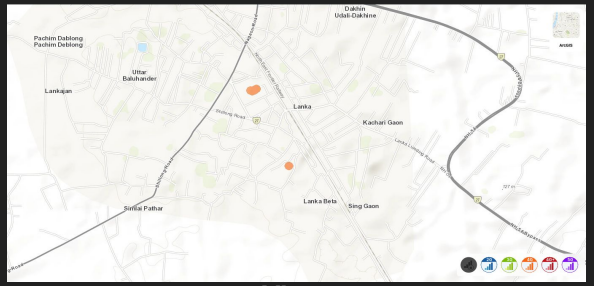

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Points of Interest in Each Village

Dablong Gaon Overview:

- **Location:** Dist Nagaon, Assam
- **RF Coverage:** Very limited, with significant gaps in network connectivity.

Points of Interest:

1. **Village Center**
2. **Local School**
3. **Healthcare Center**
4. **Agricultural Fields**
5. **Community Hall**

Importance of Addressing RF Coverage:

- **Connectivity Gaps:** With very limited RF coverage, residents face challenges in accessing digital services, financial transactions, and communication. Addressing these gaps is crucial for integrating modern technologies and improving overall quality of life.
- **Development Impact:** Expanding RF coverage in Dablong Gaon will support digital inclusion, enhance service delivery in education and healthcare, and stimulate economic activities through better connectivity and information access.

Domestic Component in the Proposal

Local Involvement:

- **Technology Providers:**
  - **Local Tech Partners:** Collaborate with regional tech companies for development and deployment.
- **Infrastructure Providers:**
  - **Local Construction/Maintenance Partners:** Engage local firms for installation and ongoing maintenance of infrastructure.
- **Community Engagement:**
  - **Local NGOs & Government Bodies:** Partner with local organizations and authorities to ensure community support and alignment with local needs.

Benefits:

- **Job Creation:**
  - **Local Employment Opportunities:** Generate jobs for residents in technology, construction, and maintenance sectors.
- **Skill Development:**
  - **Training Programs:** Offer training for the local workforce to build expertise in 5G technology and related fields.
- **Economic Growth:**
  - **Stimulating Local Economy:** Increase economic activity through project investments and improved connectivity.

Linkages

- **Collaborations:**
  - **Government Agencies:** Department Of Telecommunication
  - **Telecom Providers:** Trying to partner up with BSNL RnD
  - **Financial Institutions:** NPCI
  - **Educational Institutions:** Indian Institute Of Information Technology Guwahati

- **Objectives:**
  - **Shared Resources:** Pooling expertise and infrastructure.
  - **Coordinated Efforts:** Streamlining implementation and outreach.
  - **Monitoring & Evaluation:** Jointly assessing progress and impact.

Methodology

1. **Initial Planning:** [~Dec, 2024]
    a. Define objectives, scope, and resources.
2. **Preliminary Surveys:** [~Dec, 2024]
    a. Conduct RF coverage surveys and infrastructure assessments.
3. Project Setup: [Jan 25-March 25]
    a. Project Development Setup with traditional UPI Application prototype
    b. PCF Smart Contract Design
    c. AUSF Zero Knowledge Proof(ZKP) System Design
    d. 5G Network Slicing Design
4. **Product Development Phase I:** [April-Sep 2025]
    a. PCF Smart Contract Development and Testing
    b. Zero Knowledge AUSF Development and Testing
    c. 5G Network Slicing with traditional AUSF and PCF
5. Project development Phase II: [Oct-March 2025]
    a. PCF Smart Contract Auditing
    b. Zero Knowledge AUSF Auditing
    c. Deployment and Integration of PCF Smart Contract and Zero Knowledge AUSF in 5G Network Slice
6. **Deployment and Pilot Testing:** [April-May 2025]
    a. Test systems in selected villages, gather feedback.
    b. Roll out the solution across all targeted villages.
7. **Monitoring & Evaluation:** [June-July 2025]
    a. Assess performance, impact, and gather insights.

Expected Outcomes & Impact

- **On-the-Ground Results:**
  - **Enhanced Connectivity:** Improved network access and reliability.
  - **Increased Financial Inclusion:** Greater access to secure digital payments.
  - **Economic Upliftment:** Boost in local businesses and services.

- **Long-Term Impact:**
  - **Model for Scale-Up:** Replicable model for other rural areas.
  - **Improved Quality of Life:** Better access to education, healthcare, and governance services.
  - **Sustainable Development:** Contributing to broader rural development goals.

Budget Bifurcation & Justification

- **Budget Breakdown:**
  - **Development Costs:** INR 3,50,000 (Technology, R&D)
  - **Infrastructure Costs:** INR 1,80,000 (Deployment, maintenance)
  - **Operational Costs:** INR 70,17,792 (Salaries, utilities)
  - **Marketing & Outreach:** INR 1,50,000 (Awareness campaigns, community engagement)

- **Justification:**
  - **Necessity:** Essential for successful implementation and sustainability.
  - **Efficiency:** Optimized spending to maximize impact and minimize wastage.
  - **Return on Investment:** Expected benefits outweigh costs, including economic growth and social impact.

Thankyou