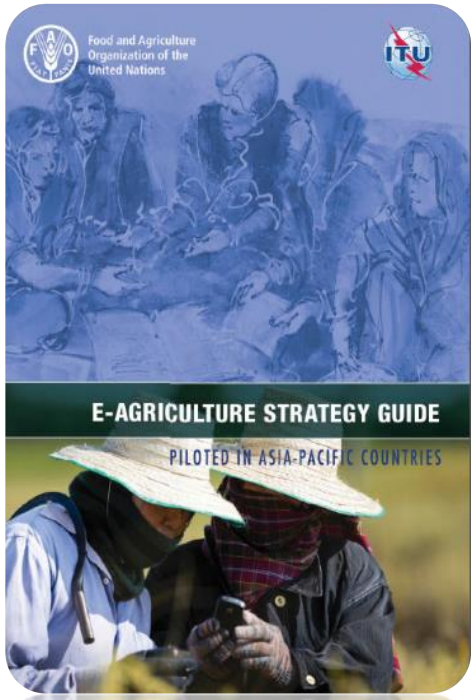
ITU – NBTC Training
On

“Building Distributed Ledger Technologies (Blockchain) Projects”

5 – 8 November 2019,
Bangkok, Thailand



Strategy Guide

Country Assistances

E-agriculture strategies, solutions

- Afghanistan
- Bhutan
- Fiji
- Mongolia
- Papua New Guinea
- Pakistan
- Philippines
- Sri Lanka

Case studies

Solutions Forum

agriculture SOLUTIONS FORUM 2018 — Thailand

agriculture SOLUTIONS FORUM 2018 — China

Trainings

FAO-ITU: E-agriculture strategy development
FAO-ITU-GIC: Use of drones, satellite imagery and GIS from agriculture
Agritech Using ICTs (Girls in ICT Day trainings)

Food and Agriculture Organization of the United Nations

ITU

CTA · fhi360 · www.cabi.org · BIID · SPC Secretariat of the Pacific Community · CGIAR Platform for Big Data in Agriculture

E-agriculture – Asia-Pacific

PNG E-agriculture Strategy Development

Ministry of Agriculture (MoA)

Agriculture Policy

DAL

Ministry of Communication & IT, Regulator

ICT/Digital Policy

DCI / NICTA

National E-agriculture Strategy

Food and Agriculture Organization of the United Nations

ITU

A guiding framework to develop sustainable national e-agriculture services/solutions

ICT Solutions Identified

Online Content

Accessible information resources on government policies and guidelines

Online information on offseason crop production technology package

Content on value addition to agriculture produce

Credible GAP content aggregation and packaging

Capacity Building

Information on enabling environment, agri-business opportunities, climate smart technologies,

E-learning content creation tools

Capacity development and education using ICT

Food and Agriculture Organization of the United Nations

ICT Solutions Identified

Disaster Management

Actionable disaster alerts

Agriculture early warning system

National Emergency Telecommunication Plan

Banking, Trading, Insurance

Credit rating and loan availability

Electronic (including mobile) banking and payment

Policy guideline and support to agri-insurance providing companies

E-market place for agriculture

Online compensation for crop and livestock affected

Food and Agriculture Organization of the United Nations

ICT Solutions Identified

Agromet data and services

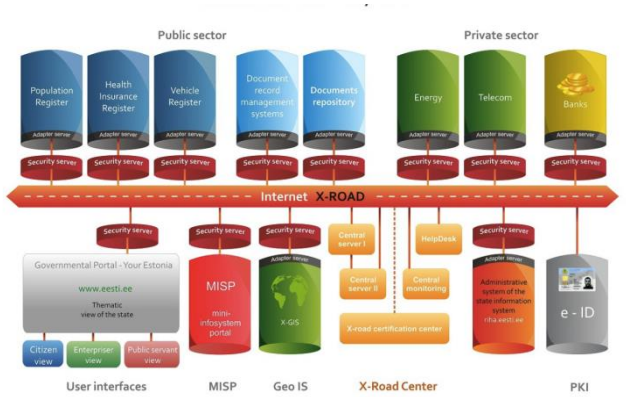
Central database of agriculture statistics

Commodity and livestock outlook modeling

Data auditing and verification

Data capture and data analysis tool (s)

Data collection and methodology standardization



Data Collection, Data Bases, Data Analytics, Modeling

Database of (livestock, seed and planting material, animal genetic resources, approved chemical and fertilizers, biosecurity, storage, farmers, fishers, herders, foresters, imports, lesser known species, plant protection, production, transport providers, nutrition sensitive agriculture, plant genetic resource)

ICT policy on data sharing, data classification, data formats, secure e-documents

Integrated natural resource management information system (soil, GIS, Land use, weather, forestry etc.)

Fertilizer history by land

Central database of research programme and new technologies

ICT Solutions Identified

Services, Logistics, Climate Change and Monitoring

Logistics (storage and transport) information and application linking agriculture service providers and markets

E-agriculture advisory services (with possible consumer protection)

Tele-working in the agriculture sector

Traceability of food safety through value chain

Traceability / DNA barcoding of prioritized species

Electronic pest and disease surveillance system

Farm mechanization information and service

e/m app for certification, standards, compliance, traceability

Online agriculture workforce information and services

Online food quality, safety, biosecurity monitoring

Climate change modeling, Smart water management

Remote video surveillance

E-Agriculture extension monitoring, Monitoring of groups/cooperatives

Monitoring of compliance to government policies, guidelines

ICT Solutions Identified

Communication
ICT Infrastructure
Connectivity

Communication channel (platform) amongst agriculture stakeholders

Linking research institutes with industry, extensions, producers and other stakeholders

ICT infrastructure for data collection, storage, analysis and sharing

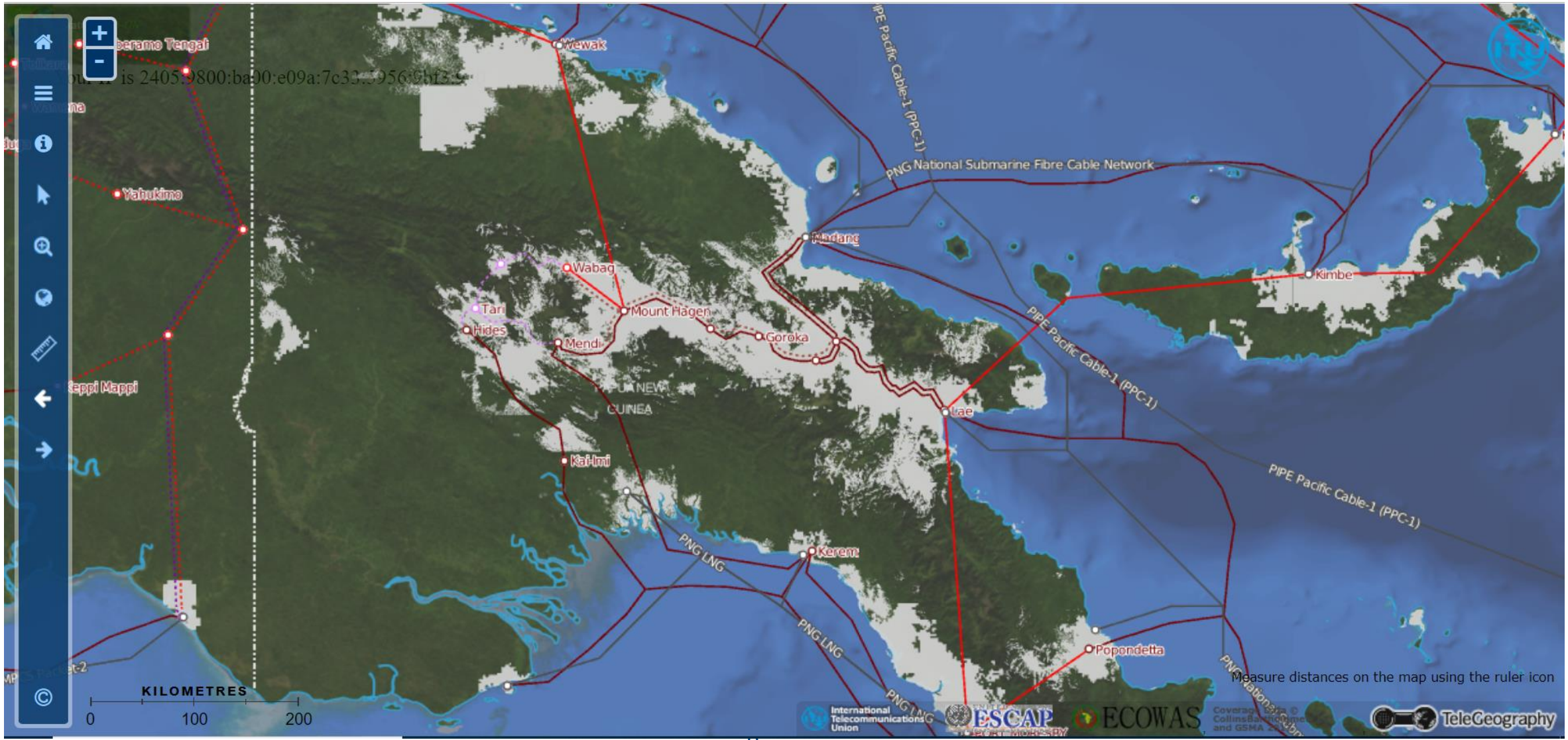
Integrating e-agriculture services with G2c

Interoperable and secure e/m agriculture application platform with content

Strengthening setting up of IVR systems

Universal mobile broadband connectivity, deployment of low cost mobile phones, tablets and sensor networks

Food and Agriculture Organization of the United Nations


Wewak
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Mount Hagen
Goroka
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Lae
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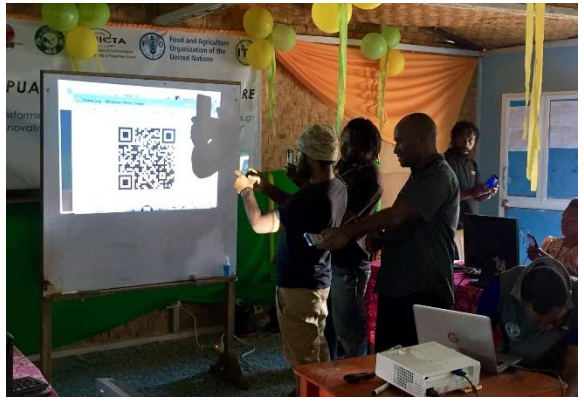
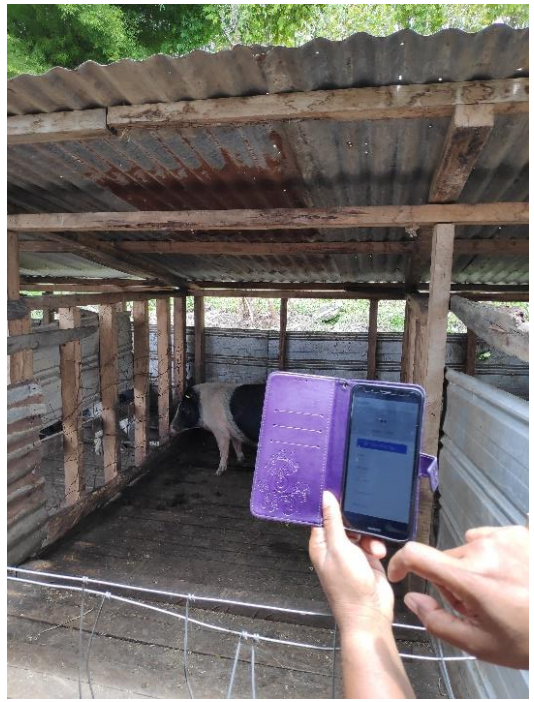
Popondetta
Kai Imi
PNG National Submarine Fibre Cable Network
PIPE Pacific Cable-1 (PPC-1)
PNG LNG
KILOMETRES
0
100
200
Measure distances on the map using the ruler icon
International Telecommunications Union
ESCAP
ECOWAS
TeleGeography

- **Broadband connectivity to resource centres in Jiwaka province**
- **Content on Jiwaka specific crop practices as requested by Jiwaka resource centre**
- **Use of FM studio and transmitter in Jiwaka province administration office to broadcast agriculture programs and live talks**
- **Traceability of livestock, watermelon, capsicum in Jiwaka to improve the sales value of product, improve quality and establish a brand Introduce traceability in coffee to link it with province and also by organic and inorganic FARMIS mobile app developed by Fresh Produce Development Agency (FPDA)**



- Setting up, sending and receiving e-mail
- Setting up and using social media to improve productivity and marketing of products
- Using smart phone, laptop and internet to improve marketing and outreach of products
- Data collection and analysis using mobile apps
- QR code generation and reading
- Brand building using traceability, RFID, packaging, collective branding

Case study: Livestock traceability in PNG

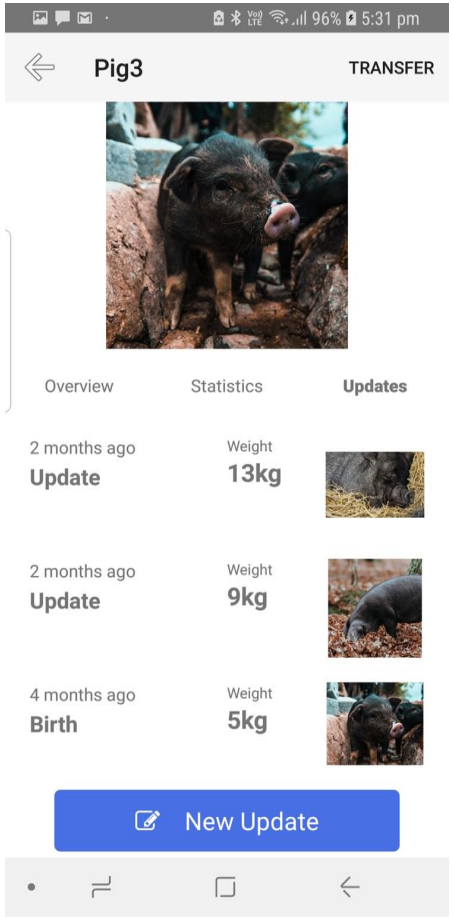


Implementation risks

- Can software be mature enough to replace the law?
- Standards are underdeveloped and not mature yet
- Energy requirement can be high
- Trusting the blockchain developers and managers
- Increased responsibility on the user
- Implementing data privacy legislation
- Policy and regulatory risks
- Speed of transaction
- Malicious users
- Identity and security

Source: FAO-ITU publication “E-agriculture in Action: Blockchain for agriculture, opportunities and challenges”

Proof of concept - Summary



The proof of concept pilot on pigs traceability for small holders in Jiawaka using blockchain is now complete and deployed. The program was developed to associate individual pigs with the quality of feed, origin, growth, etc. It has gathered high enthusiasm from all stakeholders including governments, farmers and potential buyers, and the solution is now ready to be scaled up **but challenges remain**….

The mobile application was developed using Ethereum,

A training of trainers was also carried out to manage smooth transfer of the solution and strengthen national capacity to operate, maintain and further develop it.

Stakeholders

Key stakeholders

- Jiwaka provincial administration
- Department of Agriculture and Livestock
- DCIE
- NICTA
- Farmer resource centres
- Farmers and community
- Technology provider (in this case Switch Maven)

Buyers / customers……

Farmer Participation

Benefits of the system

Share experiences with other farmers

Customers/buyers have more confidence

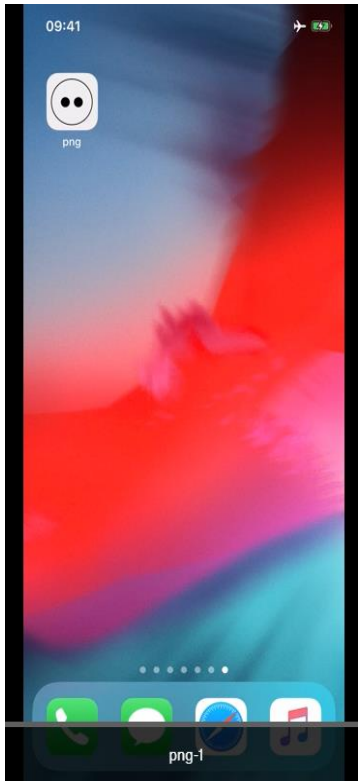
Higher price for verified pigs

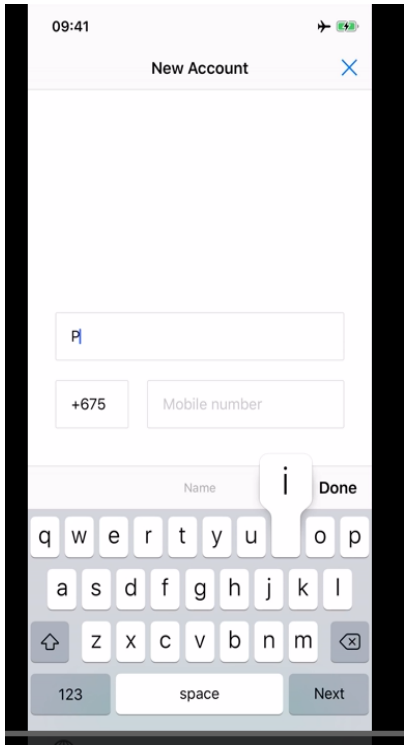
Access to more markets

What is being recorded?

Initiating the application

Registration

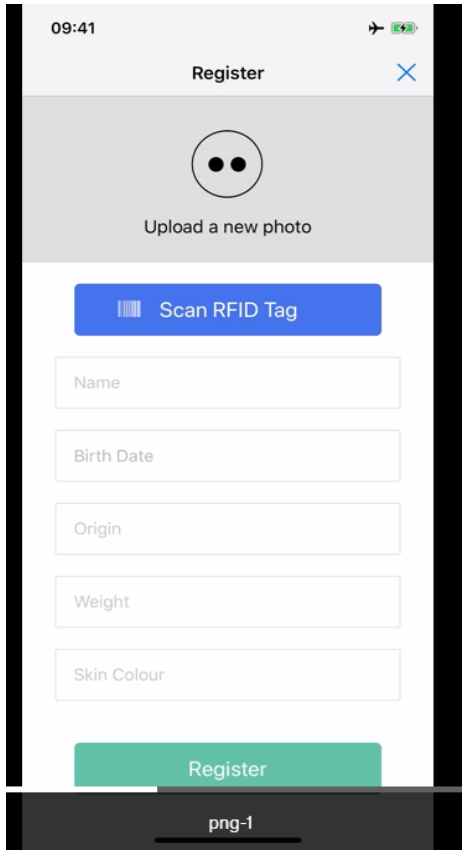




Adding data

Adding a Pig

Updating information



Adding data

Sample schedule

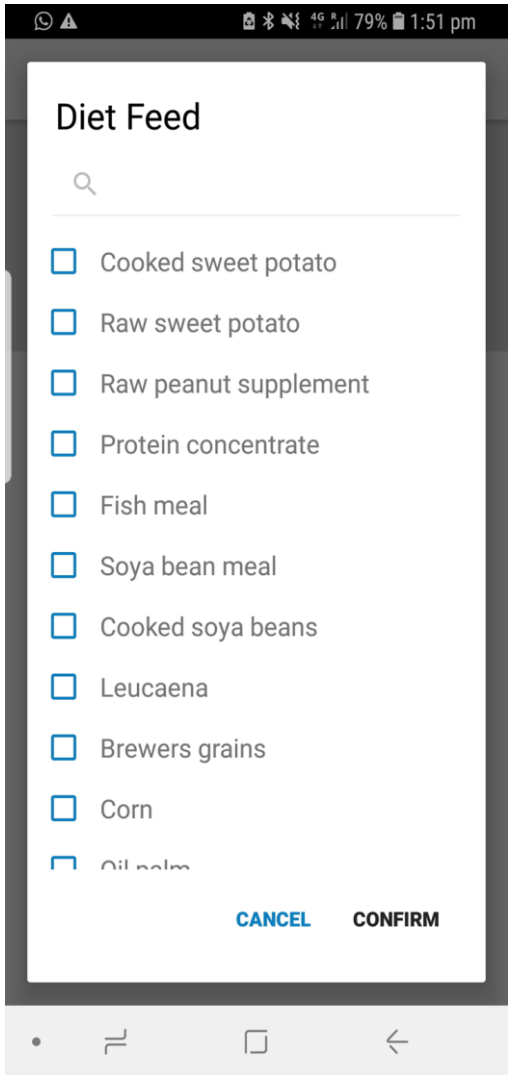
Weigh/take photo at least every 3 months

Every time you change the diet

Major incidents/any medication administered

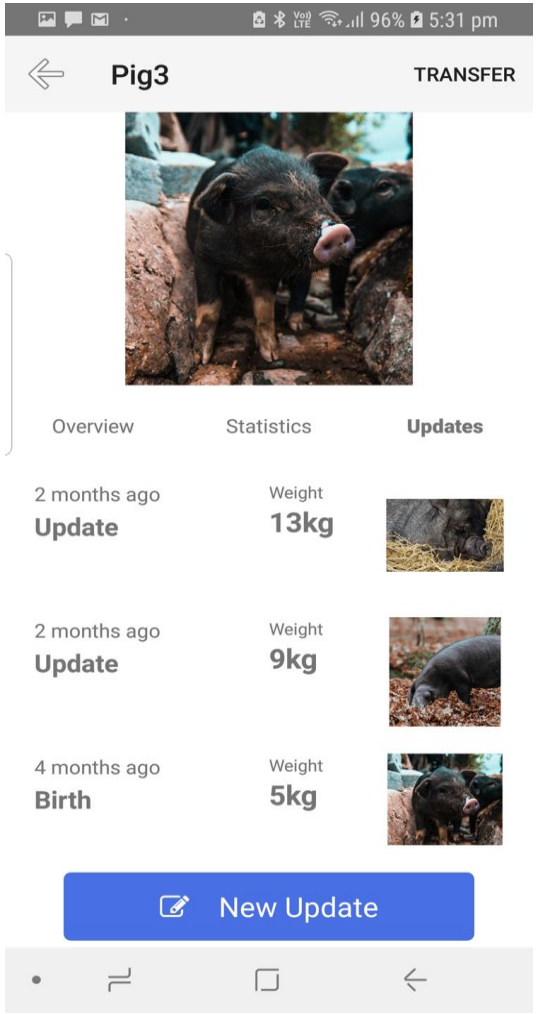
Moving to another region

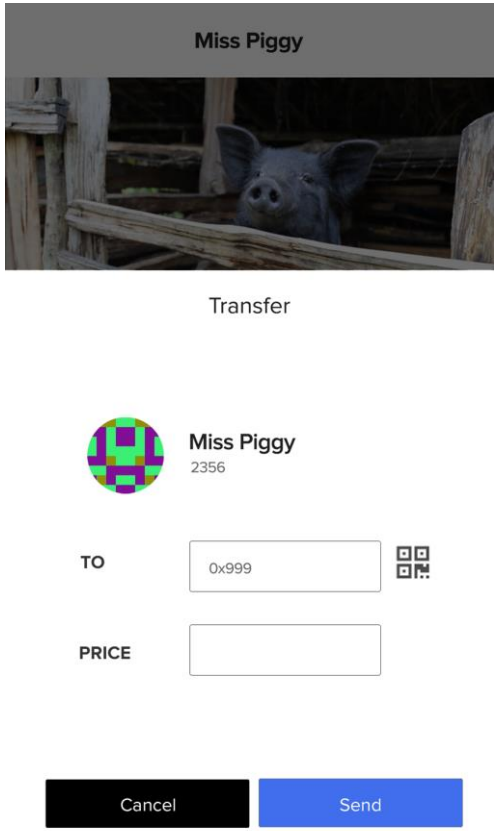
Sale/death



Sales/Transfer

The sales process



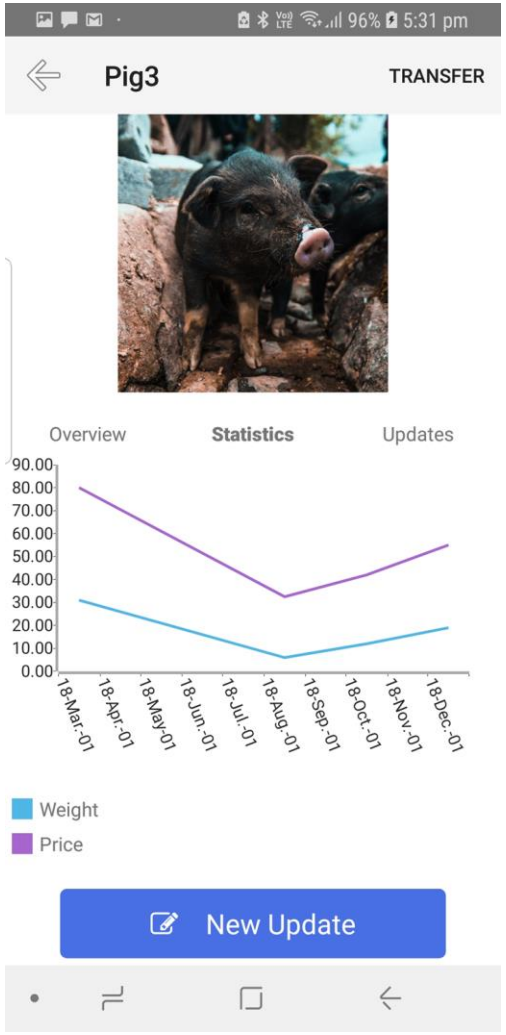


Data analysis

Where are pigs from?

What diets are common?

What are common rates of incidence?



Challenges

- Who will manage the program?
  - Need for program committee
- Farmers incentives
  - Encourage farmers, bring new buyers etc.?
- Getting stakeholders together
- Quality of data inputs – How to verify?
- Licensing and data privacy
- Data storage and location
- Update and maintenance

Steps after pilot was launched

1. Set up a program committee comprising NICTA/DAL/Provincial Jiwaka Government in order to clearly define ongoing roles and responsibilities;
2. Appoint a technical team as soon as possible to take over, maintain and develop the system;
3. Motivate farmers to continue entering data through field representatives, with a clear message of the benefits they can gain;
4. Develop a budget for the application to cover all aspects of the ecosystem, including logistics and marketplace needs. Articulate all costs and benefits comprehensively;
5. Perform a commercial analysis of the financial models possible for livestock and other agricultural products;
6. Assess other commercial considerations including privacy, insurance, data ownership and mobile payment mechanisms.

Thank You