AgriloT

NATIONAL BANK FOR AGRICULTURE AND RURAL DEVELOPMENT

NABARD

AgriloT can help to solve current Indian agricultural challenges

Team

Dr. Ismail Syed

Founder of SIFA, Tractor Control Systems, Sprayer Control Systems, Industrial Automation, RFID Communication, Embedded Technology

Naga Ramaneshwar

Director – PVM Innvensys Pvt Ltd

Worked for ITC Ltd, Agri Business Division, Designed & Implemented projects for GCMMF (Amul), Coca-Cola, Excise SCM Systems for the state Governments of AP & Telangana

Ninan Chundammanil

Director – PVM Innvensys Pvt Ltd

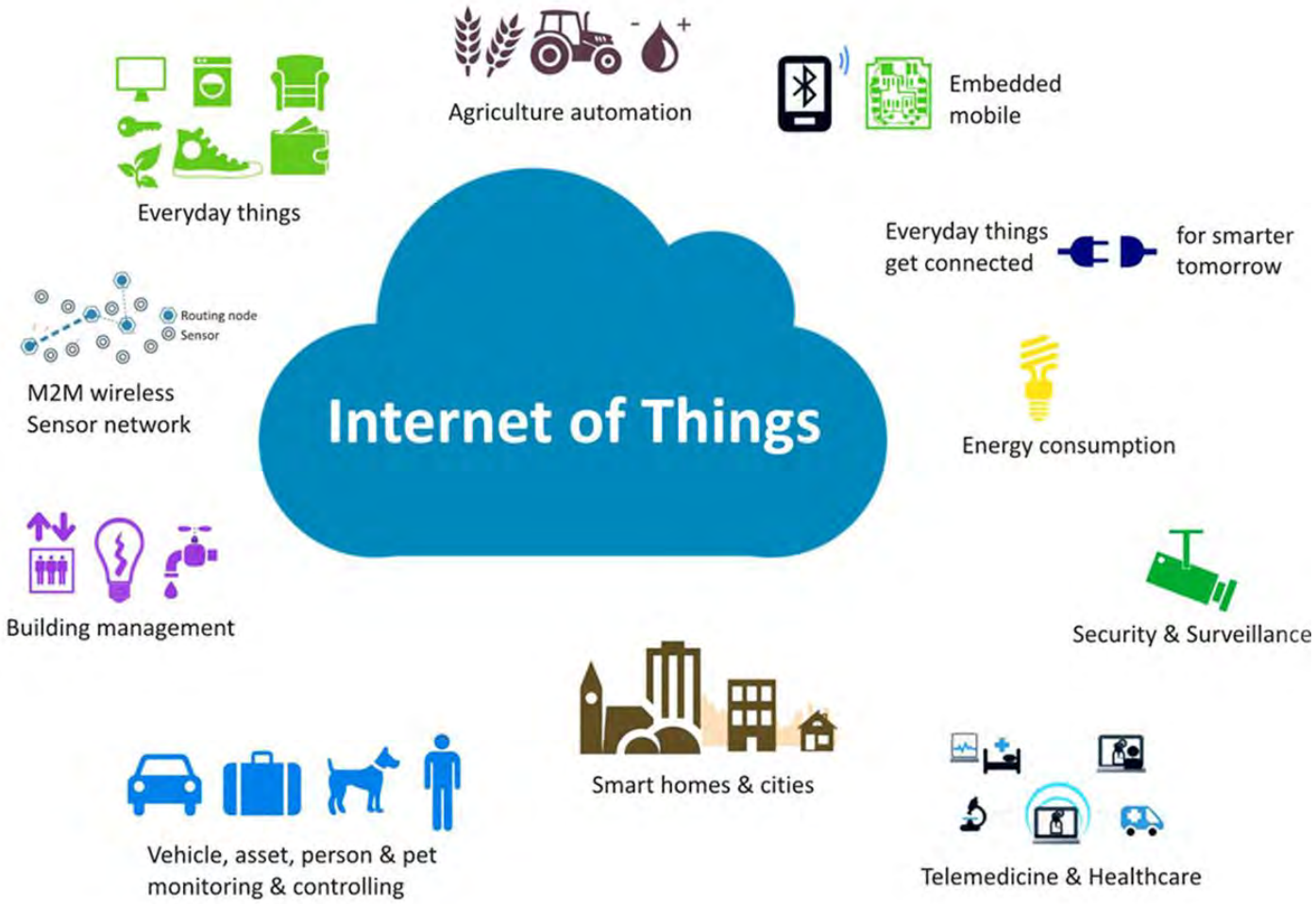
Worked for Intel, Cognizant, NVIDIA. Technology Areas in AI & ML, AR & VR, Embedded Systems. Investment Advisor for technology start-ups at WEH Ventures

What is IoT

The Internet of Things (IoT) is the network of devices such as vehicles, and home appliances that contain electronics, software, actuators, and connectivity which allows these things to connect, interact and exchange data.

-Wikipedia

Applications of IoT



Smart Agriculture

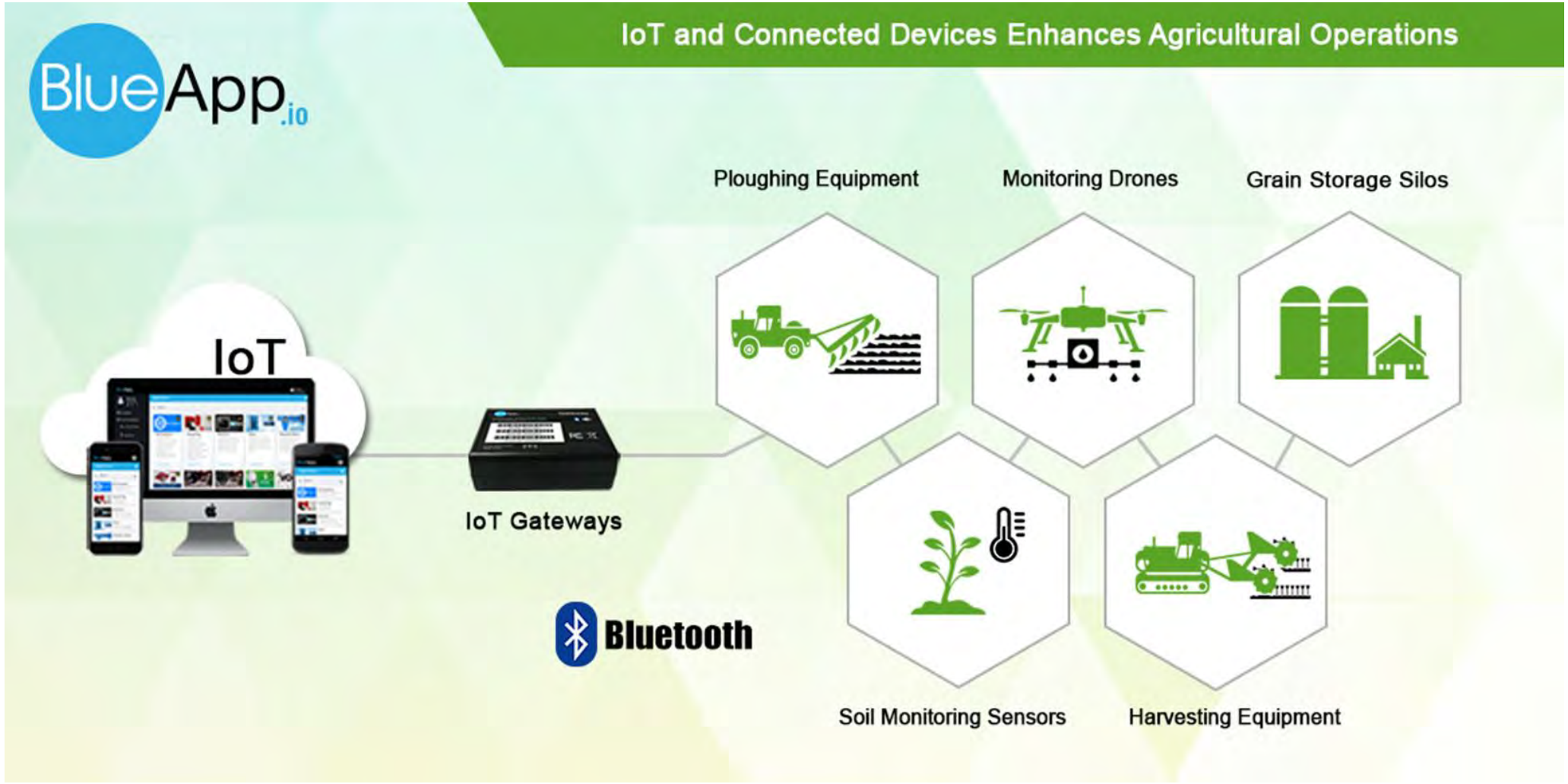
(Ministry of Communication and Information Technology- 2015)

- Projects for precision farming – monitoring and data analysis of soil moisture, vibrations, earth density and pests to detect patterns in agricultural conditions.
- Online Projects to update information and retrieve data and insights for farmers. Farmers to receive alerts for threshold variance in storage conditions and pest control requirements.
- IoT based solutions like unmanned tools for spray of pest control and other insecticides.

IoT Agricultural Applications

- Device Control & Management
- Information Apps

IoT Agricultural Applications – Device Control & Management



IoT Agricultural Applications – Device Control & Management

Agricultural Pump Control

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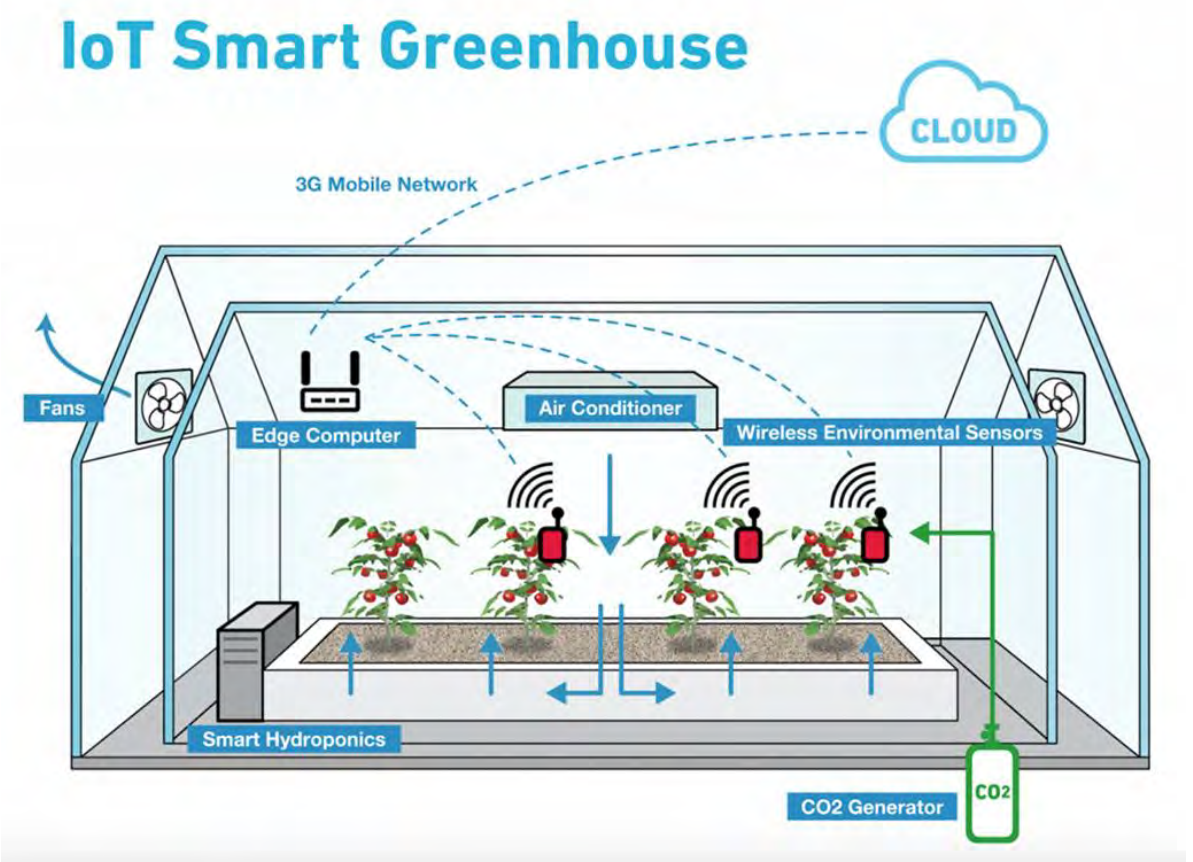
IoT Agricultural Applications – Device Control & Management

Irrigation

★★★★★

IoT Agricultural Applications – Device Control & Management

Poly House – Green House



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IoT Agricultural Applications – Device Control & Management

Spraying

★★★★☆

IoT Agricultural Applications – Device Control & Management

Machinery – Automation Bots

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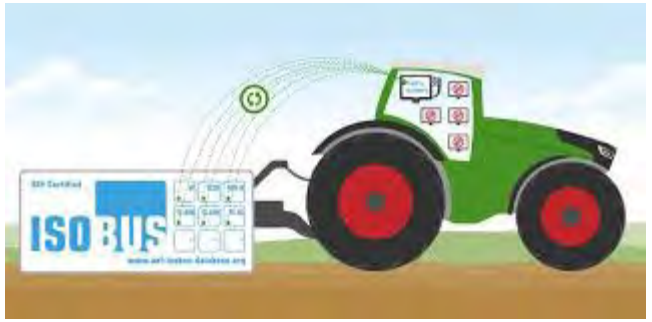
Warehouse



★★★★☆

CanBus

★★☆☆☆

Drones

★☆☆☆☆

Driverless

IoT Agricultural Applications – Information Apps

Tractor Monitoring

★★☆☆☆

IoT Agricultural Applications – Information Apps

Agriculture Information

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IoT Agricultural Applications – Information Apps

Agri Produce Marketing

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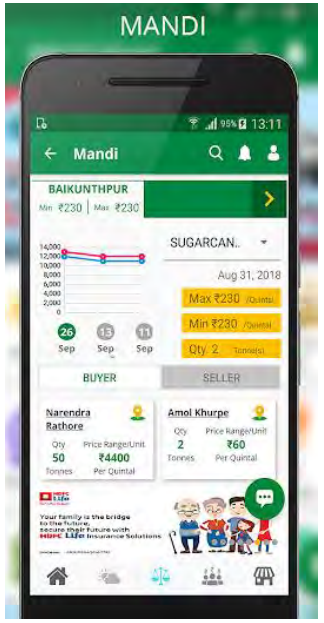
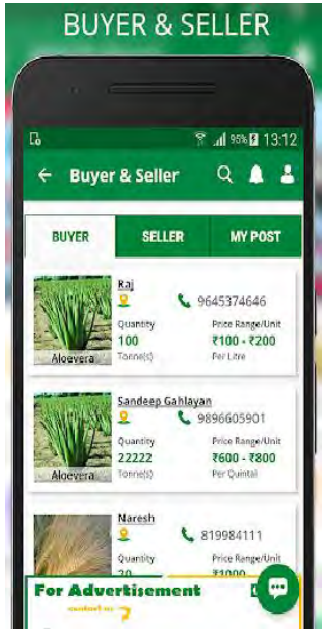
IoT Agricultural Applications – Information Apps

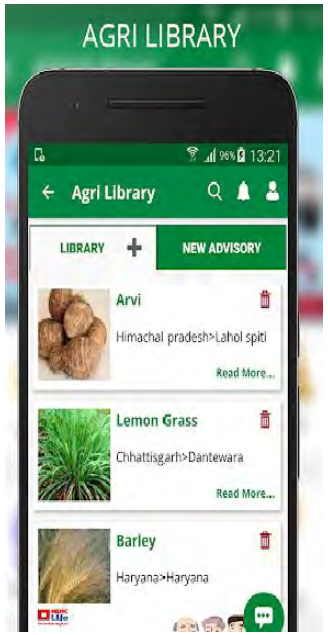
Integrated Information



Mandi



Buyer & Seller



Agri Library

★★★★★

Current Challenges in Indian Agriculture

- Reduced income of Farmers
- No protection against monsoon failure and natural calamities
- Market fluctuations
- Non availability of current cropping pattern to plan imports or advise cropping pattern to farmers
- Crop insurance implementation issues
- Reducing man power availability in farms
- No 3PL/4PL logistics for both inputs and produce
- Soil analysis and advise on fertigation

Administrative Solutions – The Phase I

- ***Cropping Pattern*** of each Agricultural land
  - Resources available
  - Soil Analysis records
  - Fertigation and Pest details
- ***Importance of 3PL in Agriculture***
  - 4PL opportunities to be created
- ***Better water and Fertigation management***

Agri Aadhar 7/12

The Agri Aadhaar is an attempt towards having a single, unique identification document or number that would capture all the details, including geographic, geological information including soil characteristics, water resources, power availability, cropping pattern, fertigation, pest details of every Agricultural land in India.

7/12 Extract ROR (Record of Rights)

VILLAGE FORM VII
Record of Rights
(Adhikar Abhilekh Patrak)
(Rules 3,4,5 and 7 of the maharashtra Land Revenue Record and Registers (Preparation and Maintenance) Rules, 1971

Village :	Wela		Taluka	Hinganghat
Survey No.	Sub division of	Tenure	Name of the occupant	Khata No.
238	-	Occupant Class	Forest Departmaent, Maharashtra State	510
Local Name of the field		Goverment		Name of the / Rent
	Cultivable area	H. A.		-
	---			Other rights :
	---			Charai
	Total			
	Pot-Kharab			
	Class (a)			
	Class (b)	2.06		
	Total	2.06		
	Assessment ..... Judi or special Assessment			Boundary and survey marks

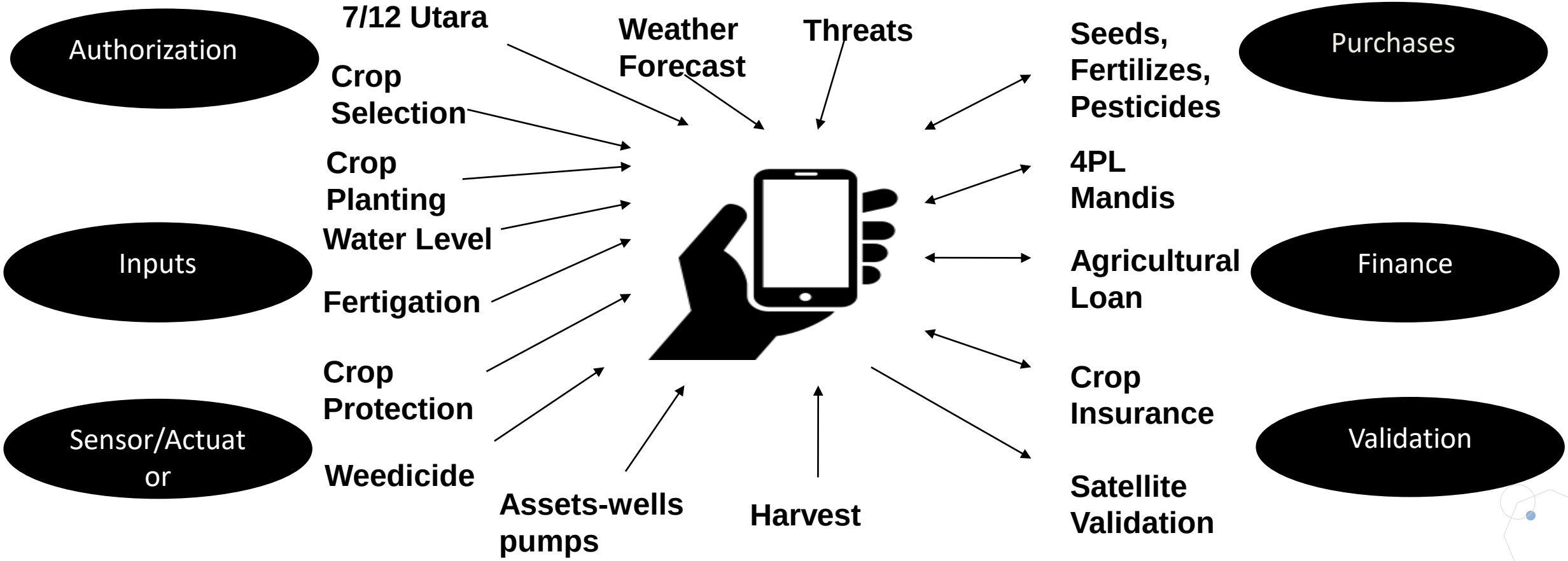
7/12 FORM XII (Register of Crops)

VILLAGE FORM XII														
Register of Crops														
(Rule 29 of the Maharashtra Land Revenue Record of Rights and Registers)														
(Prepartation and Maintenance) Rules, 1971														
Year	Season	Details of cropped area									Land not available for Cultivation		Source of Irrigation	Ramrks
		Mixed crops area						Pure crops area						
		Code No.of Mixure	Irraigated	Unirrigated	Constituent crops with			Name of crops	Irrigated	Unirrigated	Nature	Area		
					Name of Corp	Irrigated	Unirrigated							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

VILLAGE FORM VII				
Record of Rights				
(Adhikar Abhilekh Patrak)				
(Rules 3,4,5 and 7 of the maharashtra Land Revenue Record and Registers (Preparation and Maintenance)				
Village :	Wela		Taluka	Hinganghat
Survey No.	Sub division of	Tenure	Name of the occupant	Khata No.

Sustainable AgriIoT Solutions – Administrative Solutions

Agri Aadhar Application



Sustainable AgriIoT Solutions – Administrative Solutions

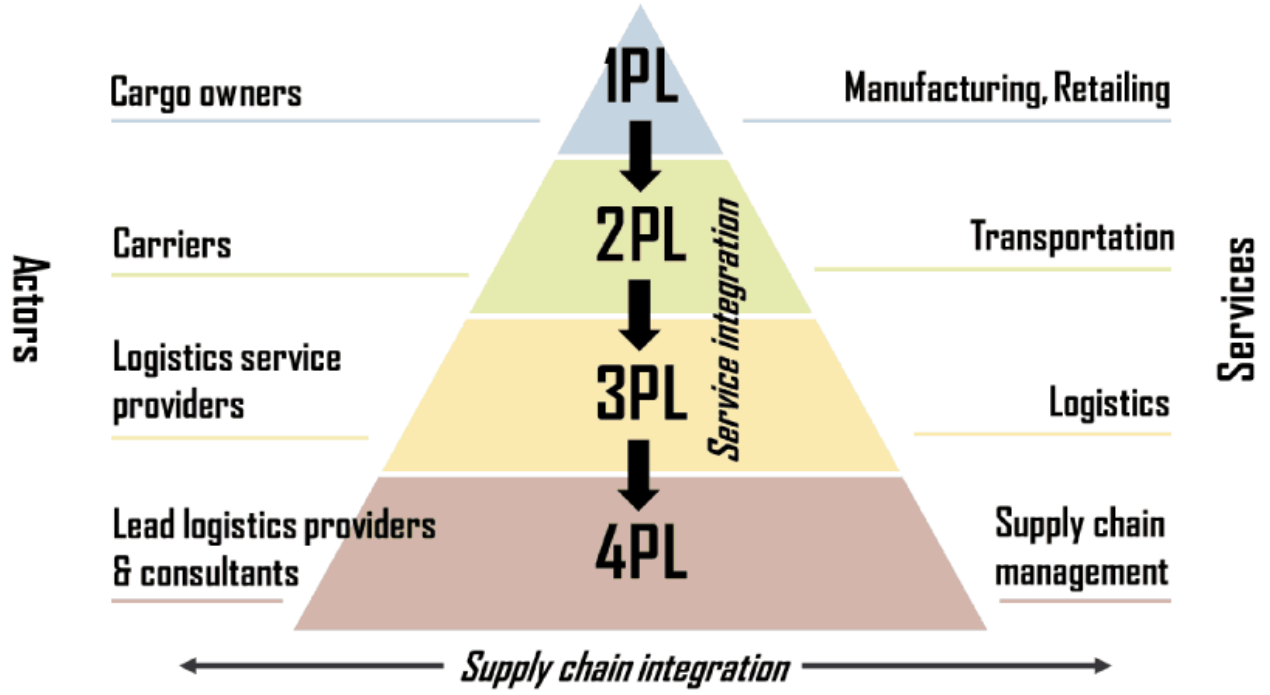
Warehousing 3PL

Warehouse 3PL

Last Mile Delivery

Sustainable AgriIoT Solutions – Administrative Solutions

4PL



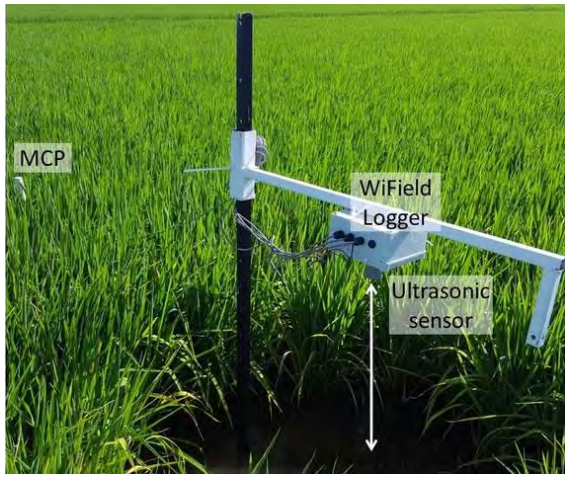
Crop Planning, Provision of Farm Inputs, Processing, Logistics, Marketing of Farm Produce

Automation Solutions – The Phase II

- *Better* ***Water Management*** of each Agricultural land
  - ***Water Level Measurement***
    - *Water level in Farm*
    - *Water level in Canal*
    - *Water level in Tube well*
- ***Fertigation Management***

Sustainable AgriIoT Solutions – Automation Solutions

Water Level Measurement



Field

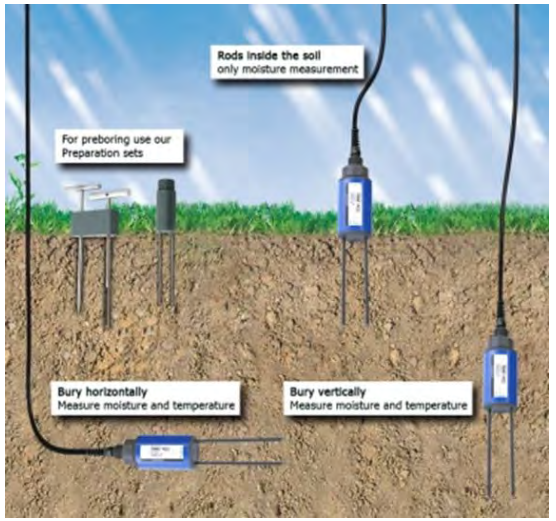
Bore Well

Canal

Tank

Soil Moisture Measurement

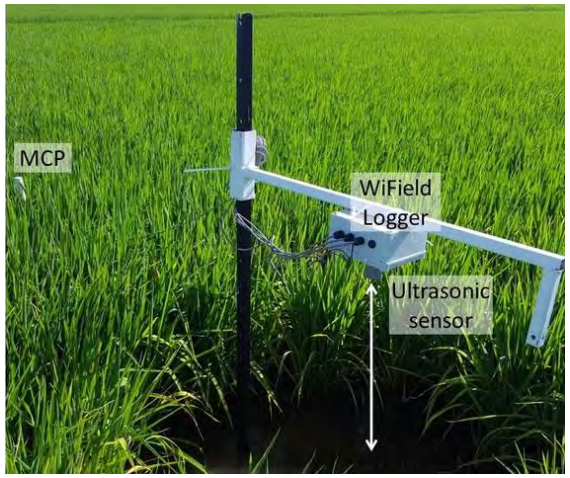
Capacitive



TDR

Sustainable AgriIoT Solutions – Automation Solutions

Actuators



Pump Starter

Solenoid Valves

Blowers

Environmental Information

Temperature
Humidity
Atmospheric Pressure

★★★★★

Rain
Wind Speed / Direction
Temperature/ Humidity/
Atmospheric Pressure
Sun light / Radiation

★★★☆☆

Network Field Sensors

v

Communication
GSM/GPRS
ISM
WIFI
LORA
Satellite

Wired Sensors/Actuators

Wireless Sensor
Actuators with Solar panel

★★★★★

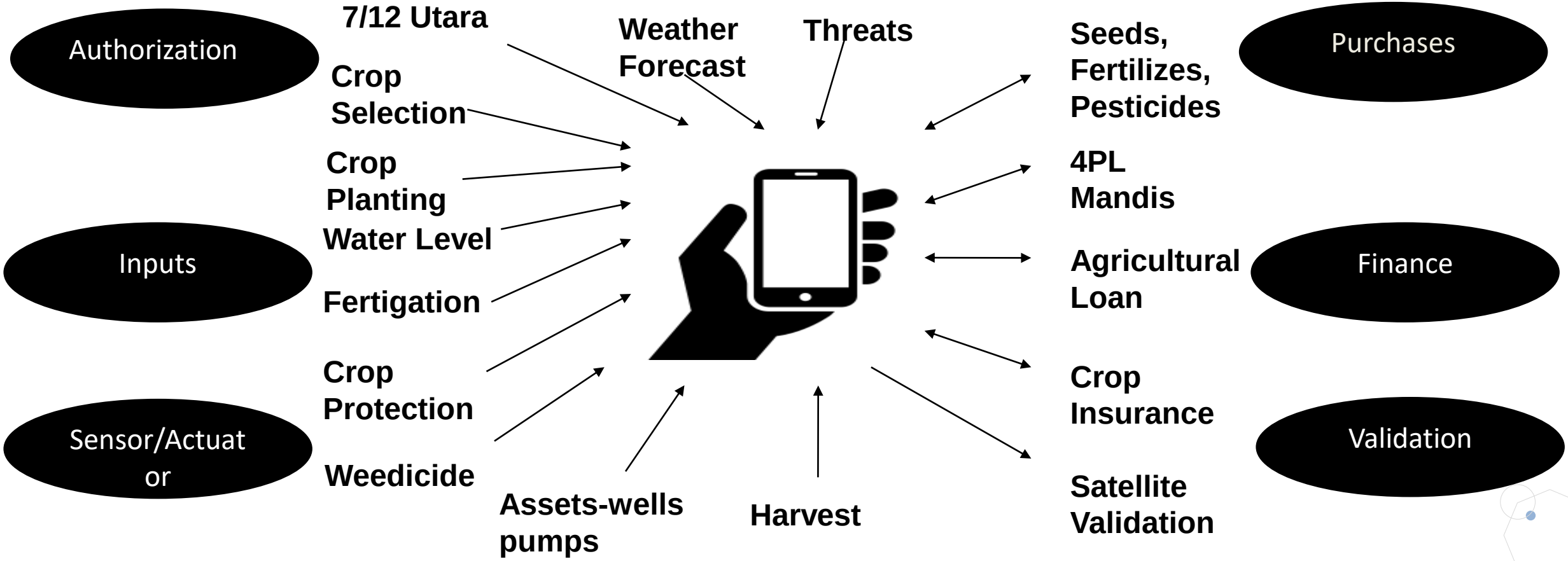
Sustainable AgriIoT Solutions – Automation Solutions

Field Challenges

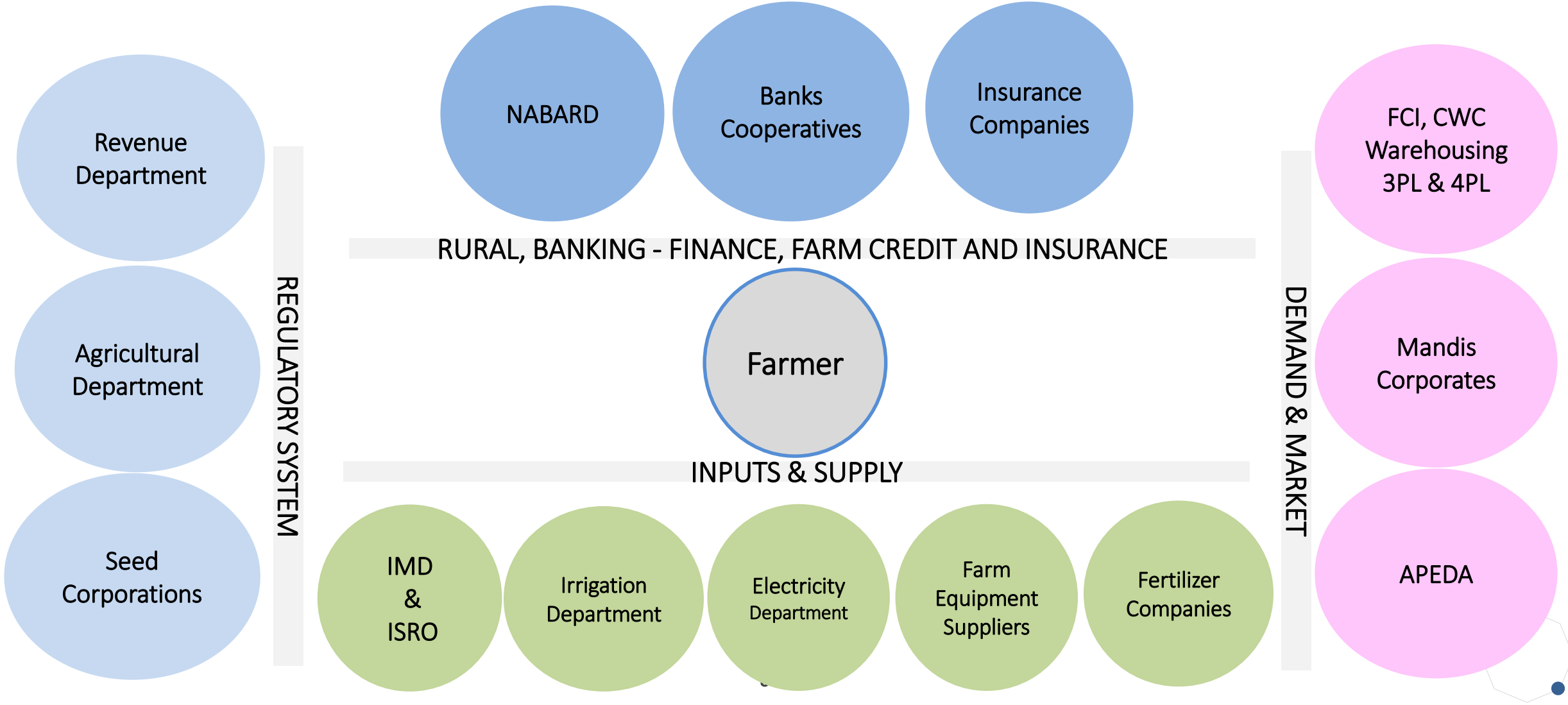
- ***Rodents, Animals***
- ***Theft***
- ***Power Outage***
- ***Networking***
- ***Return on Investment***

Pilot

Digital Platform – Agri Aadhaar



Project Stakeholders



Pilot Proposal

Project Size

15000 Farmers covering marginal, small, small-medium, medium and large

Spread

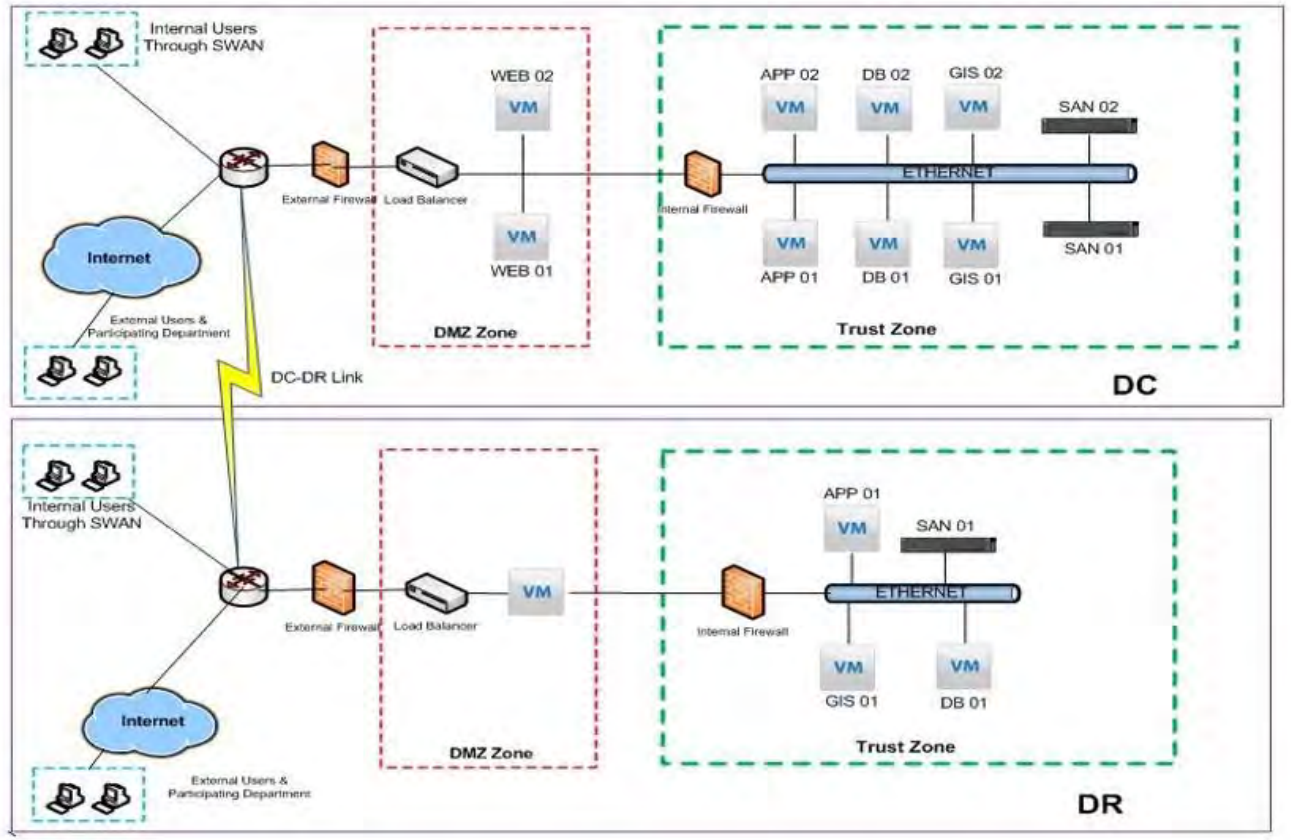
3 States

Maharashtra, Andhra Pradesh & Telangana

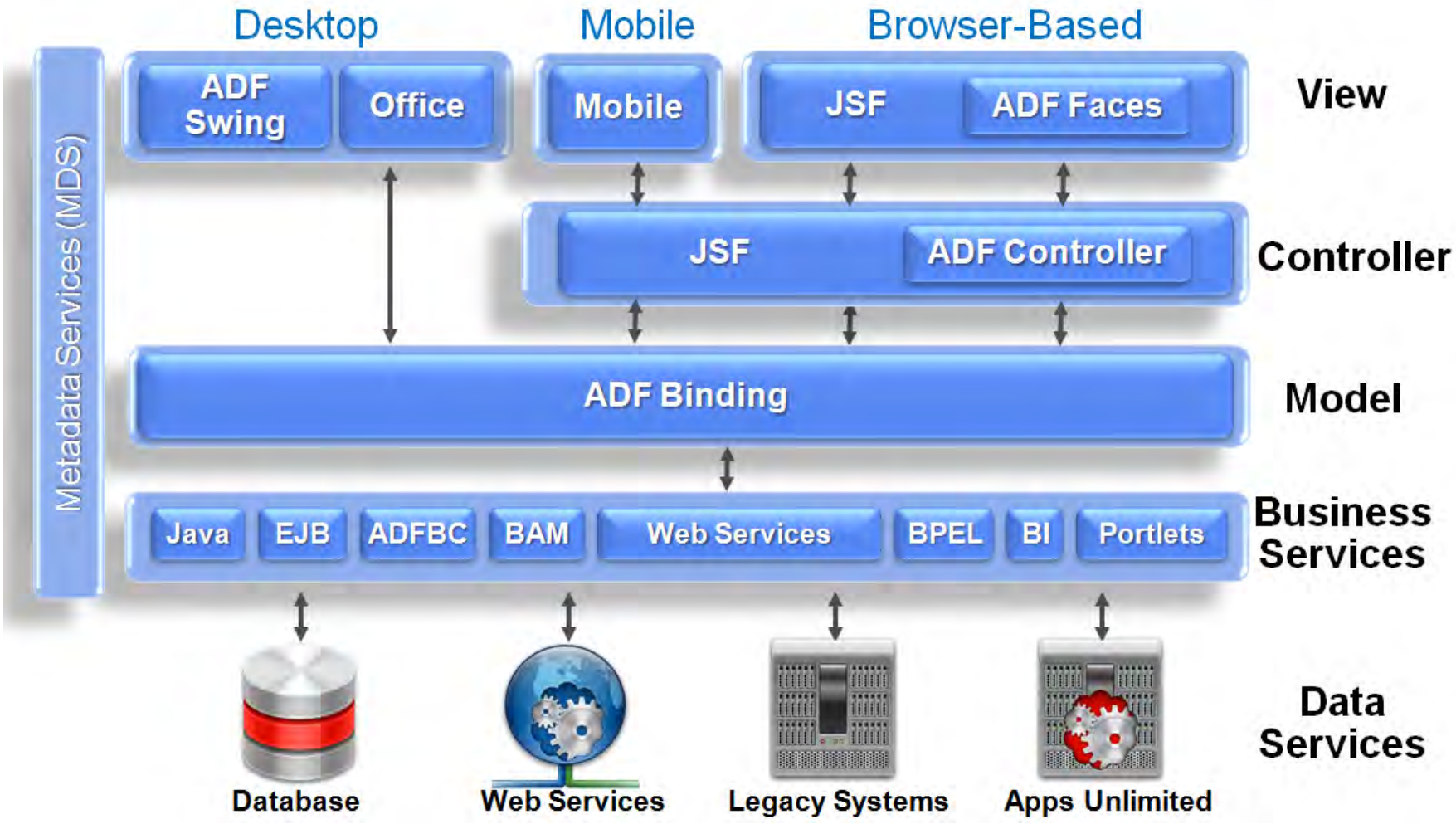
Crops

Coverage of Mixed Crops, Pure Crops, Irrigated, Unirrigated Lands

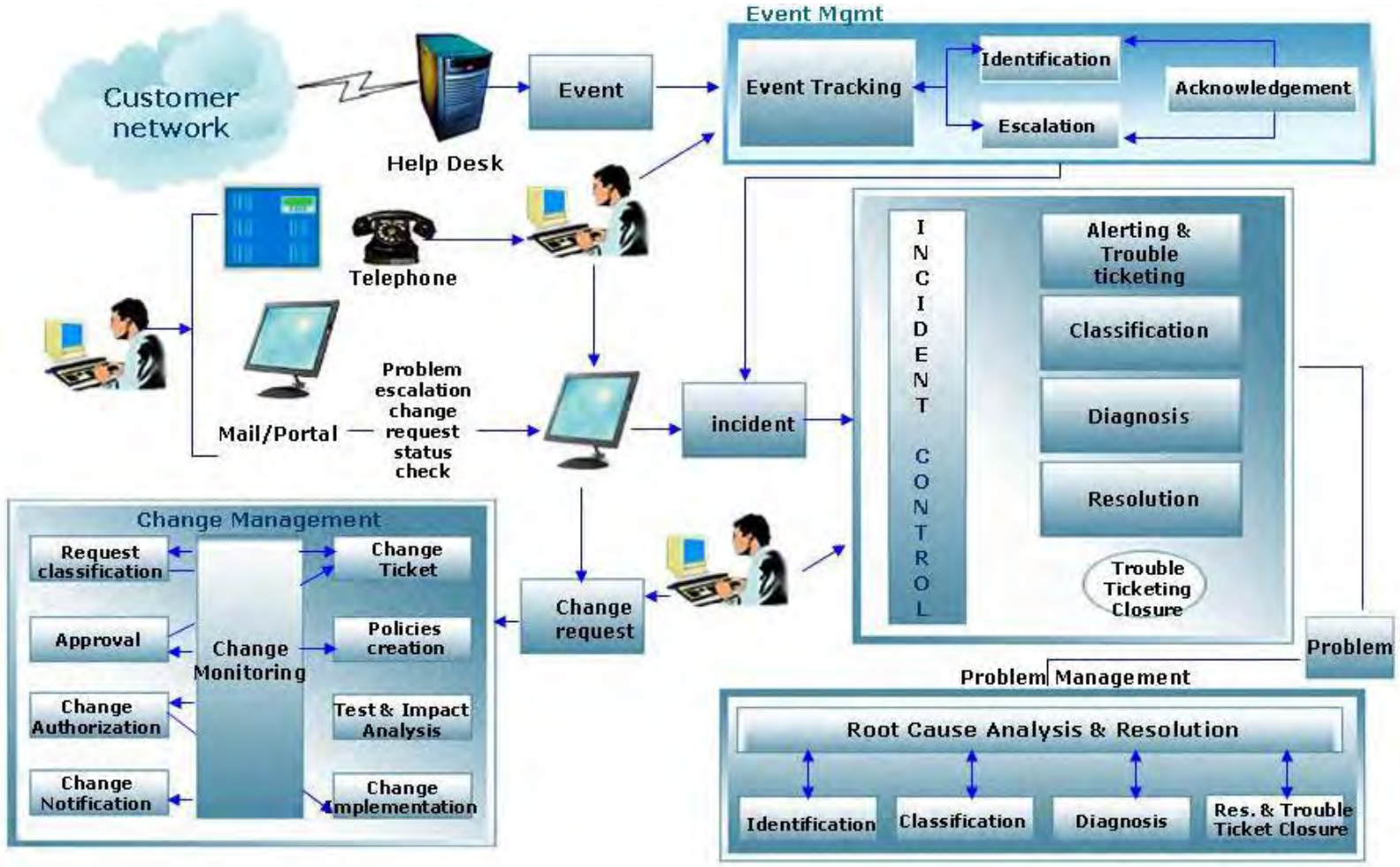
Agri Aadhar – Digital Platform – IT Infrastructure & Hardware



Agri Aadhar – Digital Platform – Solution Architecture



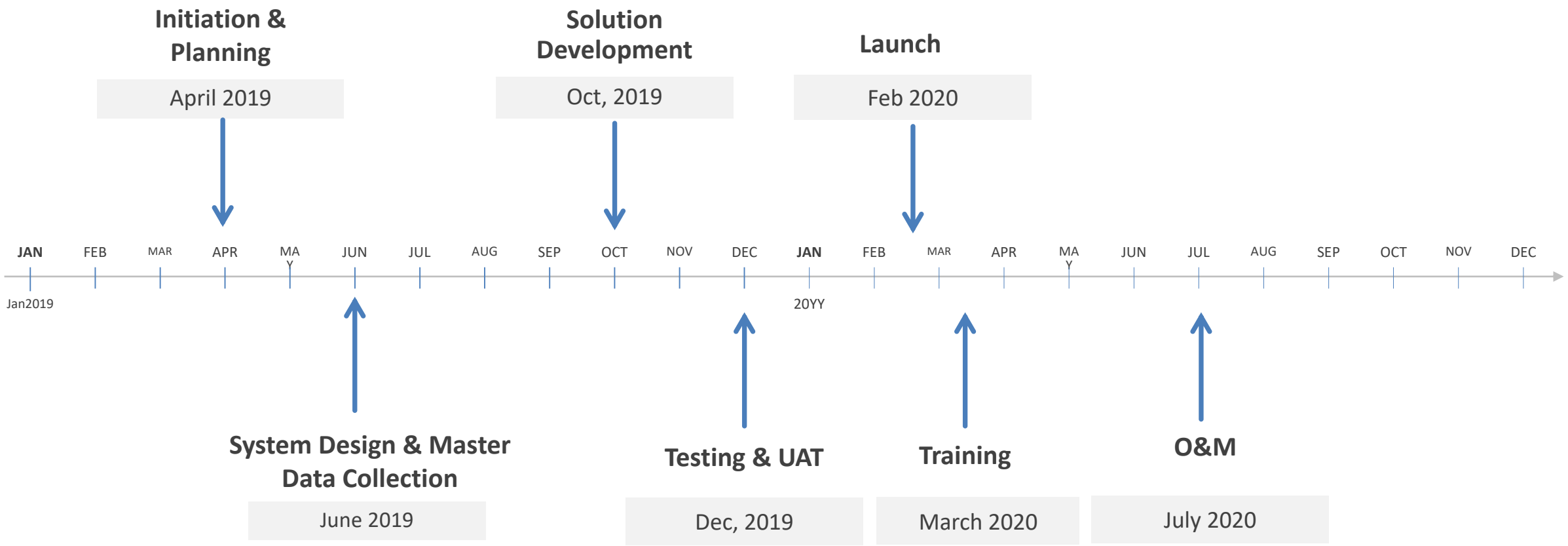
Agri Aadhar – Digital Platform – Help Desk



Agri Aadhar – Digital Platform – Change Management

- **Plan Change**
  - Defining a plan and implementation of road map
  - Creating a Change Management Institutional structure
  - Identifying Change Catalysts / levers
  - Designing Reward & Recognition Plan
  - Designing Training Content
  - Designing Communication & Awareness plan
- **Manage Change**
  - Conduct Change Management Workshops
  - Conducting Trainings
  - Create Communication & Awareness
- **Sustain Change**
  - Performance analysis through periodic examinations, evaluating performance on job , ability to create awareness and motivate team members to sustain the Change Initiative
  - Reward & Recognition Initiatives to sustain change
  - Revaluating Change Readiness
  - Re-training

Project Timeline



Project Implementations Challenges

- **Training Farmers**
  - Educational organization, NGOs, Industries.
- **Involving Farmers**
  - Media, NGOs, Village Panchayats
- **7/12 not in name of cultivator**
  - Dual Authorization by local panchayats
- **Input from Government Agencies**
  - Department of agriculture, ICAR, NABARD.
- **Soil Testing**
  - Universities (ISAE), Department of Agriculture.

Project Partners & Digital Platform SPV

- **Government/Institutional Partner**
  - NABARD
- **Academic/Professional Institutional**
  - Indian Society Agricultural Engineers (ISAE)
- **Industrial Partner**
  - ASPEE
- **Technology Partner**
  - SIFA

Agri Aadhar Digital Platform – Revenue Model

- Farm Input Companies - Fertilizers, Seeds & Pesticides
- Farm Equipment & Machinery Suppliers
- 3PL & 4PL Logistics Service Providers