



EMERGING TECHNOLOGIES ITE&C DEPARTMENT

MeitY's AKAM Week – Nov 29 To Dec 05 2021

How is Telangana shaping Digital Transformation through Emerging Technologies?

An Overview...

Rama Devi Lanka,

Director Emerging Technologies & Officer On Special Duty ,
Information Technology, Electronics & Communications Department

Government of Telangana, India

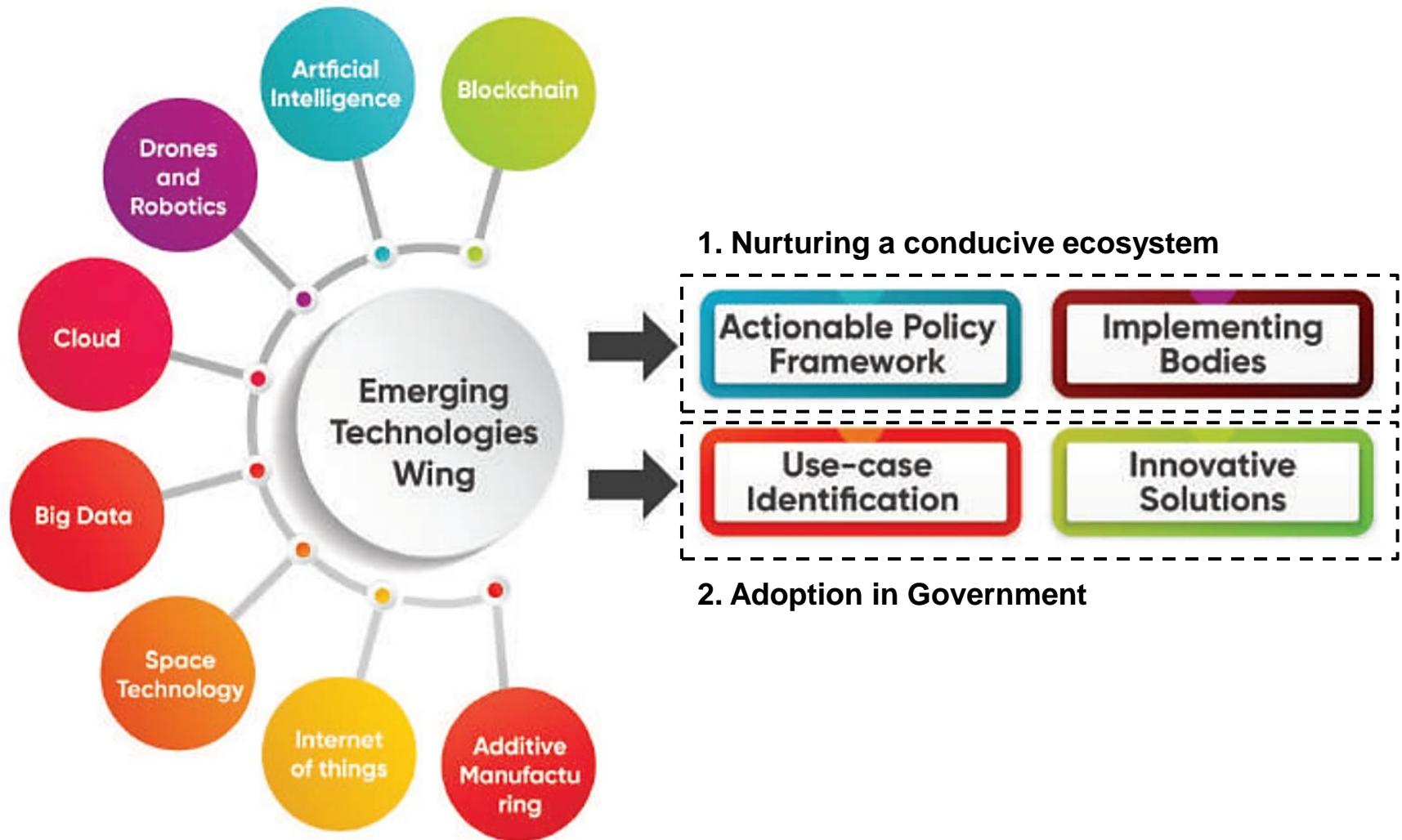
osd_itc@telangana.gov.in; 9849907639

29th November 2021

Agenda

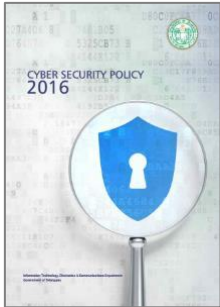
- ☐ Telangana's Emerging Technologies Wing Overview
- ☐ Emerging Technologies: Overview of GovTech Projects across technologies
- ☐ Projects in Focus
 - ☐ Saagu Baagu (formerly known as “Artificial Intelligence for Agricultural Innovation”)
 - ☐ eVoting
 - ☐ T-Chits
- ☐ Telangana's eGovernance Initiatives

State's 2016 ICT Policy's goal to become a leader in key emerging technologies led to a dedicated wing with a twin approach.



The ET Wing is driving ecosystem growth by actionable policies for each technology and implementing bodies for the same.

Policy Frameworks



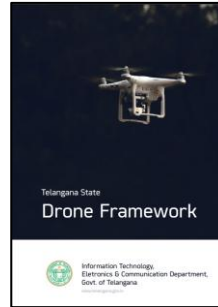
Cyber Security Policy



e-Waste Management Policy



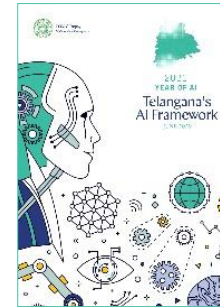
IoT Policy



Drone Framework



Blockchain Framework



AI Framework



Space Tech Framework

Institutions of Excellence



Cyber Security CoE

The CoE aims to facilitate local and global collaborations to increase the footprint of GCCs and will be an enabler in building Cybersecurity Startup Ecosystem.



E-Waste CoE

The CoE, in partnership with MeitY, aims to create a vibrant e-Waste refurbishing and recycling ecosystem in the state through various technological initiatives.



Blockchain District

Blockchain District is the anchor around which Hyderabad's blockchain ecosystem is flourishing to make Hyderabad as one of the top 10 Blockchain Cities of the world



Telangana AI Mission (T-AIM)

T-AIM is a dedicated team that is steering the initiatives identified under the AI framework to establish Hyderabad as of the Top 25 Global AI Innovation Hubs by 2025



National Centre for Additive Manufacturing

The centre, in partnership with MeitY, shall be responsible for **boosting the domestic additive manufacturing ecosystem** by offering access to infrastructure, and synergizing the efforts of all stakeholders.

The ET Wing supports government adoption of technologies by use-case identification followed by GovTech projects.

35+

Active Projects across technologies, partners, and scale



15+

In Artificial Intelligence



10+

In Blockchain



7+

In Drones



3+

In IoT and others



AI for Agricultural Innovation (AI4AI)

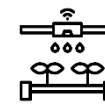
A flagship multi-stakeholder project, now renamed as "Saagu Baagu"



Seed Traceability



Medicine from the Sky



Irrigation and Nutrient Management



Pest Detection in Cotton with advisories



eVoting



Afforestation by Seed Bombing



Flood Modelling

Project Examples

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The initiatives in AI started with the launch of 2020 as Year of AI...

The declaration of Year of AI...



AI is expected to transform the global economy and **early adopters will have first-mover advantage**. Therefore, the Telangana government is setting a vision to **accelerate AI readiness and develop a conducive ecosystem** in the State.” – KTR, ‘Empowering AI Leadership’ at Davos 2020.

...was accompanied by multiple partnerships.



Telangana launched the “Year of AI” to boost the AI ecosystem with multiple partnerships and a calendar with **74** AI-related Events, in collaboration with 12 AI ecosystem enablers.

... that culminated into numerous initiatives and activities to accelerate AI ecosystem.



Centre for Responsible Deployment of Emerging Technologies (CRDET) - Partnership with World Economic Forum



State Partner for NASSCOM's Xperience AI Summit



Representation in Responsible AI for Social Empowerment (RAISE 2020)



Applied AI Research Centre (INAI) established at IIIT-H in partnership with Intel and PHFI



AIC_CCMB TIDE 2.0 Ideathon for ICT in Life Sciences & Biotechnology



AgriTech Grand Challenge to use AI for solving specific use-cases



March to Million Initiative by Microsoft and Nasscom FutureSkills



Inauguration of HexArt Institute, India's First AI Community Center



Hack4Resilience Hackathon

Overview of major projects across departments.



Agriculture



**Saagu Baagu
(AI4AI)**



**NextGenGov 'Data For
Policy' Initiative**



**Pest Detection in
Cotton with advisories**



**Quality Assaying of
Agri Commodities**



**Price Discovery, Volume
Mgmt. at e-marketplaces**



Mobility



**Drive Monitoring and
Accident Prevention**



**Forward Collision
Avoidance System**



**Smart Traffic Light
Management**



Healthcare



**Newborn Risk
Assessment**
(AI based Anthropometry)



Law Enforcement



Smart City
(Multiple Use-Cases)



**Criminal Records
Synchronization**



**Crowd
Management Tool**



**Face mask violation
enforcement**



eGovernance



**Real-Time Digital
Authentication of
Identity (RTDAI)**



**Facial Recognition
for Voting**



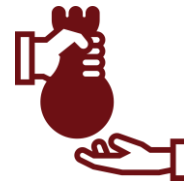
Chatbots



**COVID19
Data Platform**

Also, the state is implementing more than 10 Blockchain use cases across user departments...

Based on our experience so far, blockchain is best suited for transactional records in multi-stakeholder processes. Immutability of Blockchain enables a tamper proof and transparent record of transactions. This reduces audit complexities, enhances data security and promotes efficient process governance. Moreover, some multi-party processes such as compliance, can be automated using smart contracts.



Credit Cooperative
(StreeNidhi)



T-Chits



Vehicle Life Cycle
Management



Seed Traceability



Civil Supplies
tracking



Student
Credentials



eVoting



FIR and Evidence
Tracking

...and is proactively adopting drones across innovative use cases.

Use-Cases

Medicine from the Sky

T-MEDS
(mosquito eradication)

Hara Bahara
(Reforestation)

Power Lines Inspection

Volumetric Analysis of Mines

Precision Agriculture

1st State

3 Partners

- Asia's First and Largest organized trials for drone based medical deliveries
- Launched in presence of Hon'ble Union Minister for Civil Aviation and Telangana's Hon'ble Minister for IT, Industries, and MAUD

- World Economic Forum
- NITI Aayog
- Apollo Hospitals

8 consortia

Conducted trials out of 16 applicants

MEDICINE FROM THE SKY



45
Days

350+
Flights

850+
Kms Travelled

500+
Kgs of Total
Weight Lifted

10,000+
Vaccines Doses
Shipped

510
Max Doses Lifted

10
Max Kg Lifted

36
Km/h Avg Speed



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Saagu Baagu (formerly known as AI4AI) is Telangana's flagship project for leveraging technology in agriculture...



Vision

To transform the state of agriculture by deploying emerging technologies in a scalable, inclusive and sustainable way.

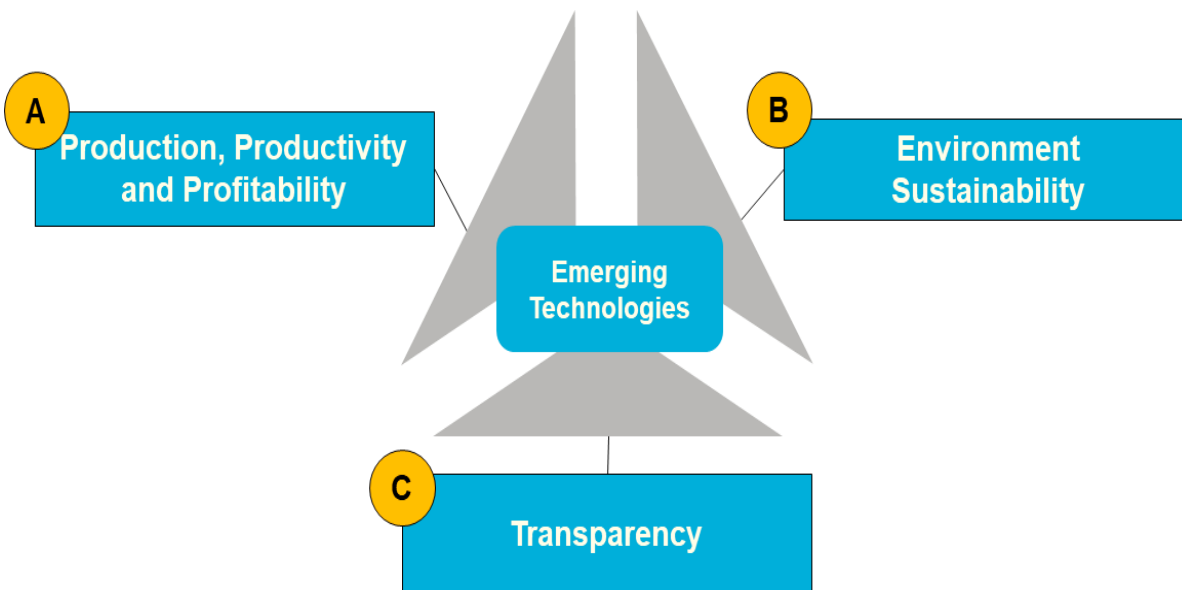
Overview

- Government of Telangana's multi-stakeholder initiative in partnership with C4IR India & state's Agri University
- Initiated in Aug 2020
- 7-month effort of **4 Working Groups** (70-member community)
 - ✓ Intelligent Crop Planning
 - ✓ Smart Farming
 - ✓ Farmgate-to-Fork
 - ✓ Data-driven Agriculture
- **9 Frameworks & 30 use cases defined**
- On-Ground Implementation to be mobilized under the request for EoI that has been released.

...with an objective to leverage emerging technologies for agriculture and alleviate challenges for agri innovation.

PPP initiative with industries, start-ups and agri institutions to **drive adoption and scale up of emerging technologies** across **agriculture production systems**

Project Objectives



Desired Outreach

100,000
Farmers

1,000
Villages

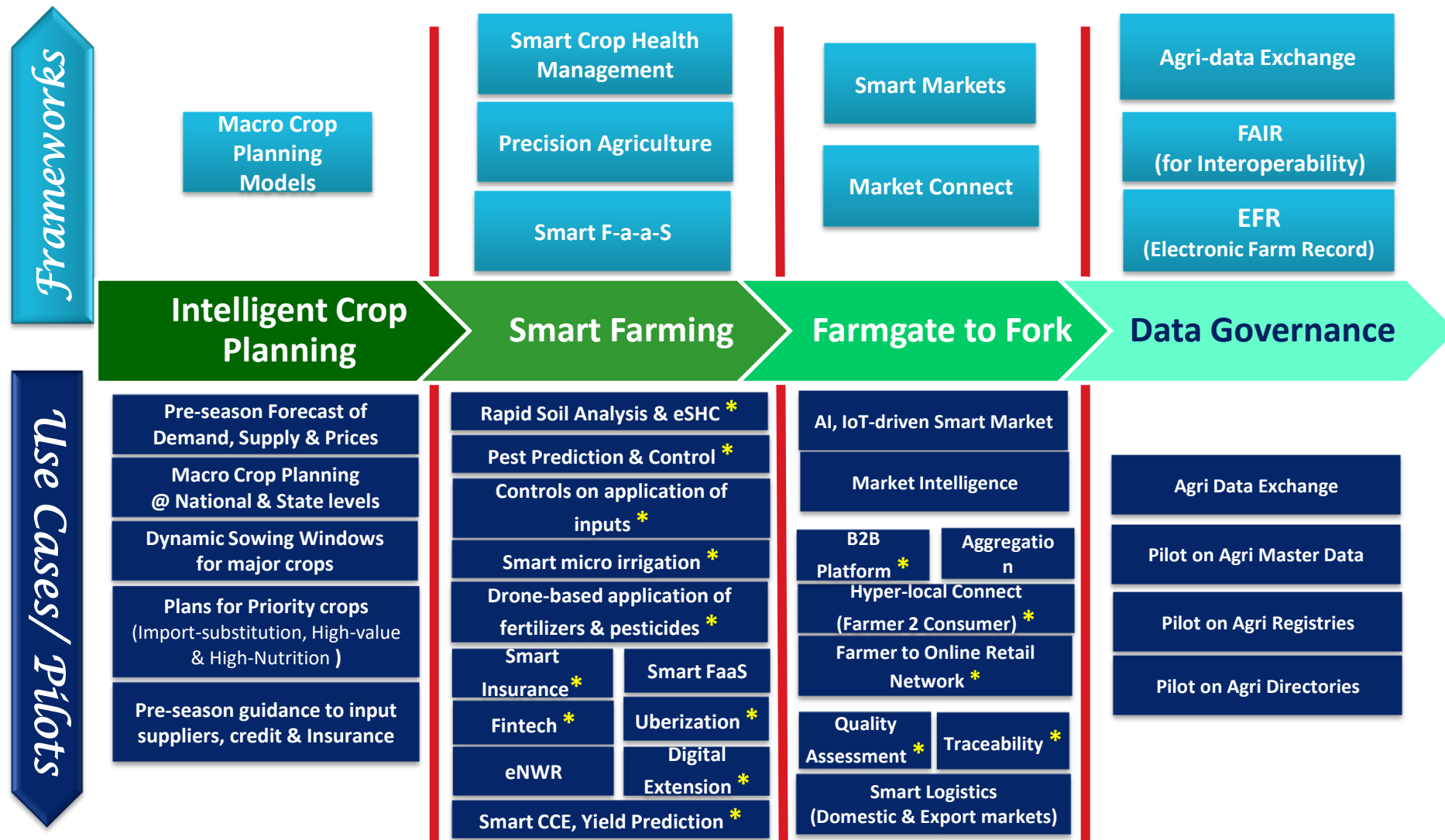
100
Farmer
Collectives

4
Seasons

Challenges for Agri Innovation

- **Data:** Availability of agriculture data for enablement of Innovation
- **Front-end:** Scaling and high cost of front end delivery of services to farmers
- **Innovation Enablement:** Domain Knowledge and Use case validation, Technology validation, policy enablement
- **Protection environment:** Protect stakeholders for unintended consequences and fairness

9 frameworks and 30 use-cases have been identified to create impact across the Agri value chain.



An EoI was released to identify a Project Implementation Partner with a consolidated view of AgriTech solutions.

Objectives of the EoI

1. To **identify suitably qualified Project Implementation Partners** and **their consortia** of leading Agri ecosystem players, to partner with Government of Telangana State (GoTS) to prove and establish the transformation potential of innovative technological solutions for enhancing the value, create new value or redistribute the value along the Agri value chain.
2. To facilitate the **deployment** of innovative solutions, **on a pro bono and non-exclusive basis**, by the partners to be identified through this EoI.
3. To **evolve methods for scaling** of the proven solutions.

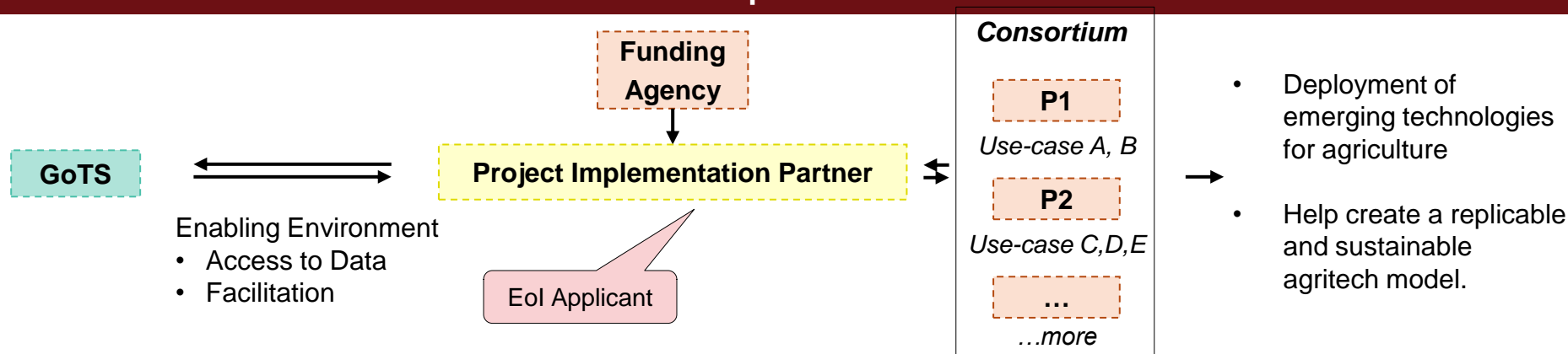
Scope

Initial cohort confined to 5 crops in 10 (out of 33) districts **across 2 years** (3~4 crop cycles).

Crop	Districts
Kharif	
Cotton	Nalgonda, Adilabad
Chilli	Khammam
Turmeric	Jagtial
Rabi	
Ground Nut	Nagarkurnool, Wanaparthy, Jogulamba
Bengal Gram	Adilabad, Kamareddy, Nirmal

Out of the 30 use-cases specified before, PIP can implement 5+ critical use-cases in each value chain.

Illustration of Implementation Model



Further, development of an Agri Data Exchange (ADEx) is progressing...

Why ADEx?

1. Agricultural **data is confined** to the enterprise that collects or generates it. Hence its potential value remains undiscovered.
2. There is **no structured way of sharing** the agricultural information, much less in an automated and rights-protected manner.
3. **Accessing** agricultural data for innovation is deterrent because of the **tedium, cost, effort and time taken**.
4. There is **no single point of reference** to get data required from multiple sources for creating integrated and innovative services.

Objectives of ADEx

1. To **connect** the providers and consumers agricultural information in a consent-based and secure manner.
2. To provide for efficient **discovery** of agricultural data required for innovation & research
3. To convert 1-1 data transfers to N2N data exchange, and thereby create a **force multiplier** effect.
4. To accelerate the evolution of the national digital agriculture ecosystem through open standards, open protocols and open APIs in **data management**.
5. To help intensify the use of **emerging technologies** through ease of accessing data.
6. To provide safeguards for **protection** of personal data
7. To enable the data providers to specify the terms and conditions for **sharing** of data and the purpose and period for which the data can be used by the consumer.
8. To establish **transparency** in all processes relating to data exchange.
9. To establish mechanisms for addressing **grievances** and complaints of the users

... with a prioritized approach and focus on select use-cases.

←----- Attributes of the Use case/ Service ----->

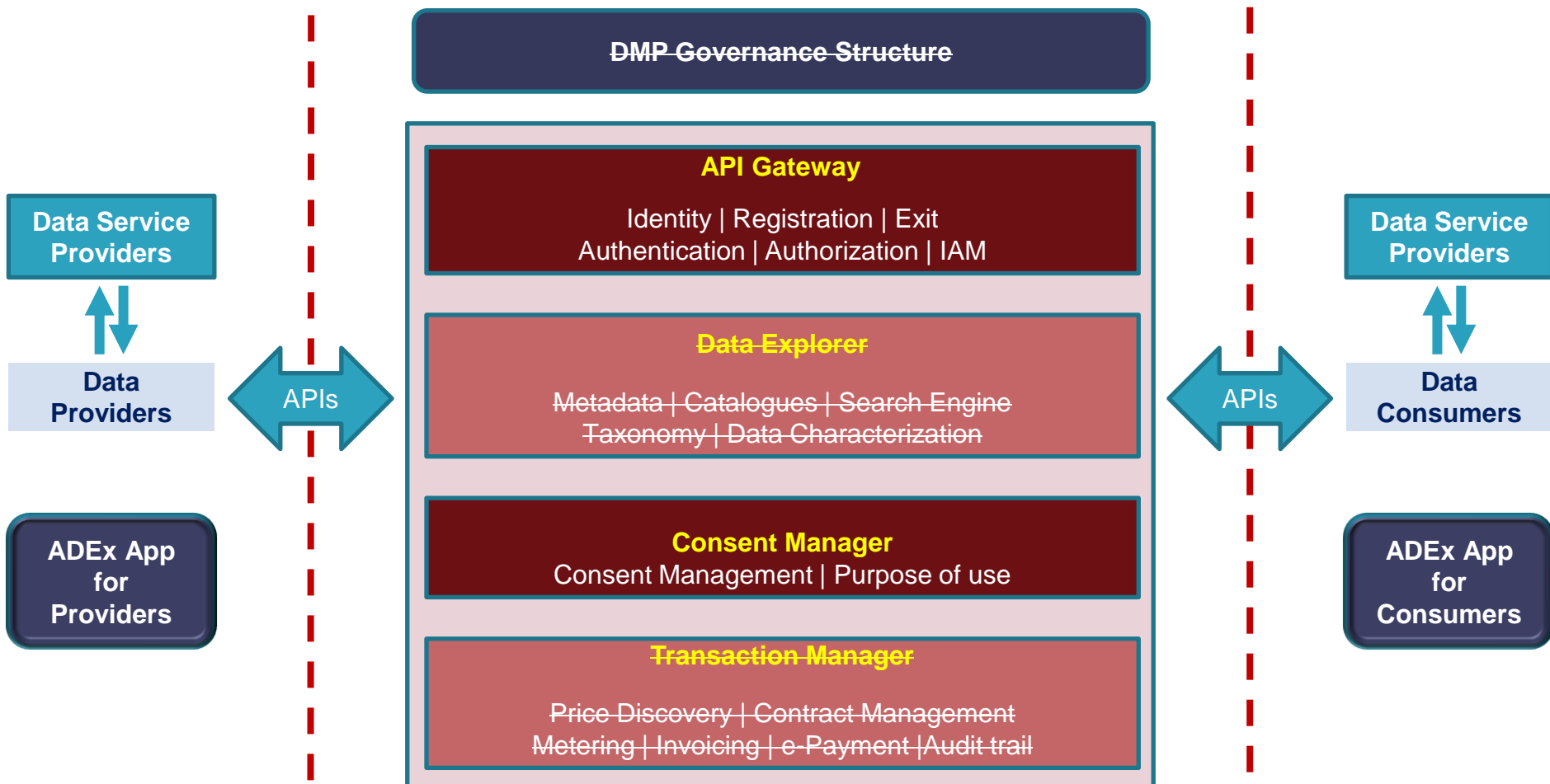
Description of the Use case	Specificity	Data-driven	Data-intensive	Value addition	Potential Demand	Status of database	Scope for 4IR Tech / Innovation	Overall Rating	
1. Weather & soil-based advisories on sowing (crop-specific, village level)								74 %	
2. Hyper-local weather & soil-based advisories on sowing (crop-specific, farm level)								80%	
3. Weather & soil-based advisories on pest prediction and mitigation (crop-specific, village level)								92%	2
4. Hyperlocal weather & soil-based advisories on crop health mgt (farm level)								92%	2
5. Soil health management, e-Soil Health Reports (farm level)								100%	1
6. Precision agriculture - Prescription-based application of inputs								80%	
7. Uberized farm machinery services								68%	
8. Traceability for export products and organic produce								92%	2
9. Quality testing for pricing, consumer assurance								80%	
10. Crop area estimation								68%	
11. Yield estimation								80%	
12. Hyper-local connect (farmer-to-consumer)								86%	3
13. Smart Insurance								86%	3
14. Smart credit								80%	

 = 14%

 =8%

Minimum Viable Architecture of ADEx.

2 Building Blocks



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An E-Voting Platform has been designed around stakeholders and their roles.



Citizens



Administrator (TSEC)



Returning Officer (RO)

Activities

- Registration
- Voting

AI, ML, etc. – 3 factor authentication

- Overall Administration
- Registration of Returning Officers (RO)
 - Setting up of Voting and Registration Dates
 - Generation of Reports

- Ward wise Ballot generation and signing
- Counting

Storage of votes on **Blockchain** to ensure immutable records

Modules



Registration



E-Voting

Android App



Admin & RO Portal



Counting

Online Web Portal

Fundamentals considered while designing the Solution.

Citizen Authentication	Legitimate Voting	Ease Of Use	Security
<p>3 Factor Authentication during registration:</p> <ul style="list-style-type: none"> Name Matching with Aadhaar Liveness Detection of Individual Image Matching with EPIC Database <p>2 Factor Authentication during voting:</p> <ul style="list-style-type: none"> Liveness Detection of Individual Image Matching with pre-matched registration photo 	<p>Preventing mis-use of digital voting:</p> <ul style="list-style-type: none"> Phone Number used during registration and voting should be same; and SIM should be inside the device Phone (or Device ID) during registration and voting should be same Only 2 registrations are allowed per device to prevent mass voting 	<p>Simplistic Design</p> <ul style="list-style-type: none"> Minimal and Clearly Defined Steps Detailed help section with tutorial videos Available in both English and Telugu <p>Assurance to citizen</p> <ul style="list-style-type: none"> Confirmations prompts at each stage such as during name matching, pre-ballot, before casting vote, after casting vote, etc. Digital Audit Trail 	<p>Registration/Voting:</p> <ul style="list-style-type: none"> All data is stored in State Data Centre (SDC) with disaster recovery in CDAC Attendance and Vote Transactions are separately stored (to ensure ballot secrecy) Dual-encryption of votes and their storage using Distributed Ledger Technology (for immutability) Ballots are digitally signed Security Hardened Mobile Application (Root Detection, Anti-Emulation, Tamper detection, SSL Pinning, etc.) SSL is used between the mobile and servers <p>Admin/Counting:</p> <ul style="list-style-type: none"> Ward-wise Votes decryption & validation based on authentication by RO (or authorized officer)

Demo and Sample UI.

Registration Module (Samples)

13:12 79%

Registration తెలుగు | हिंदी

- 1 Voting Smart Phone Verification
- 2 Aadhaar Authentication
- 3 Voter Verification
- 4 Photo Upload

Enter EPIC number / Voter ID:
Ex : ABCXXXXXX

Enter your EPIC number here

Provide the mobile number of this device
Please note that the same device has to be used for voting

Enter your Mobile Number Here



Submit

First Page

13:34 80%

Registration తెలుగు | हिंदी

Points to note while photo capture

Do's	Don'ts
 <p>Your Face to be at the center of the frame.</p>	 <p>No multiple faces.</p>

Click here to capture your photo


Please note that it is mandatory to capture your photo for completion of registration

Photo Upload

Voting Module (Samples)

13:55 82%

Vote తెలుగు | हिंदी



You are Voting as

Name: **Patil Mahesh Uttam**







EPIC Number : **WKH0101139**

Confirm

Confirmation

13:55 82%

Vote తెలుగు | हिंदी

1	RAJESH GOVIKARI రాజేష్ గోవికారి		Vote
2	VENGALA NAYUDU వెంగళ నాయుడు		Vote
3	SRI RAM శ్రీ రామ్		Vote
4	MAHAMMAD MOHINODDIN మహమ్మద్ మహినొద్దీన్		Vote
5	SUDHAKAR REDDY సుధాకర్ రెడ్డి		Vote
6	MAHESH BABU మహేష్ బాబు		Vote

Ballot

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T-Chits is being used for administration of Chit Funds that faced inefficiencies before owing to the high volume of transactions.



Regulators

Due to sheer volume of data:

- × Inefficient Processes
- × Reactive system
- × No tools for monitoring / regulating

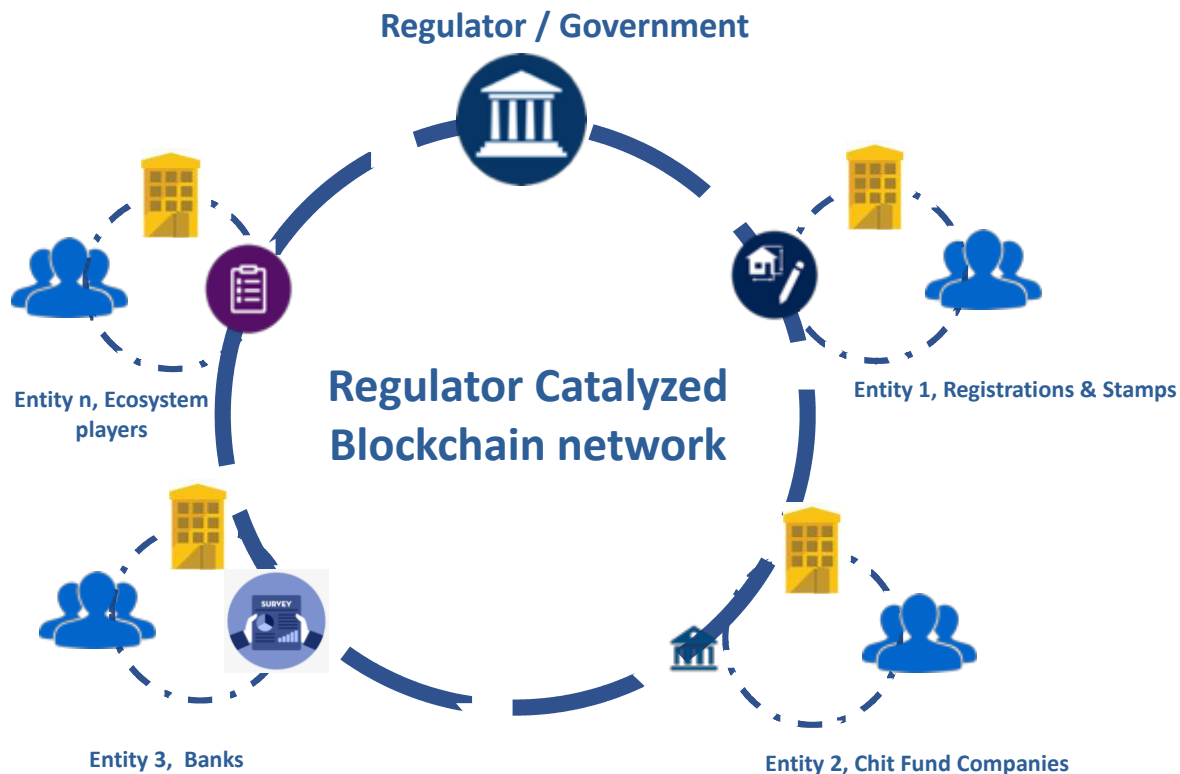


Subscribers

- × No information on registered groups
- × Mis information on companies
- × No transparency in grievances



The Approach.



India's first of its kind Blockchain Network for Chit Funds

- Making Chit funds Accessible and Credible for subscribers
- Easing the regulatory work and compliance process
- Enabling companies with Technology
 - Process efficiency (eKYC, eSign, etc)*
 - Paperless* and Cashless

Catalyzing a Financially Inclusive Ecosystem – Beyond Digitization

Metrics – (As on 14th Sep 2021)



Oct '18
Launched



All 14 regulator
Offices Telangana



31,599
+
Groups



1696+
Chit fund Offices



12,28,300+
Subscribers



20,145.84 Cr+
Monies rotated Per Annum



2,60,354+
Blocks

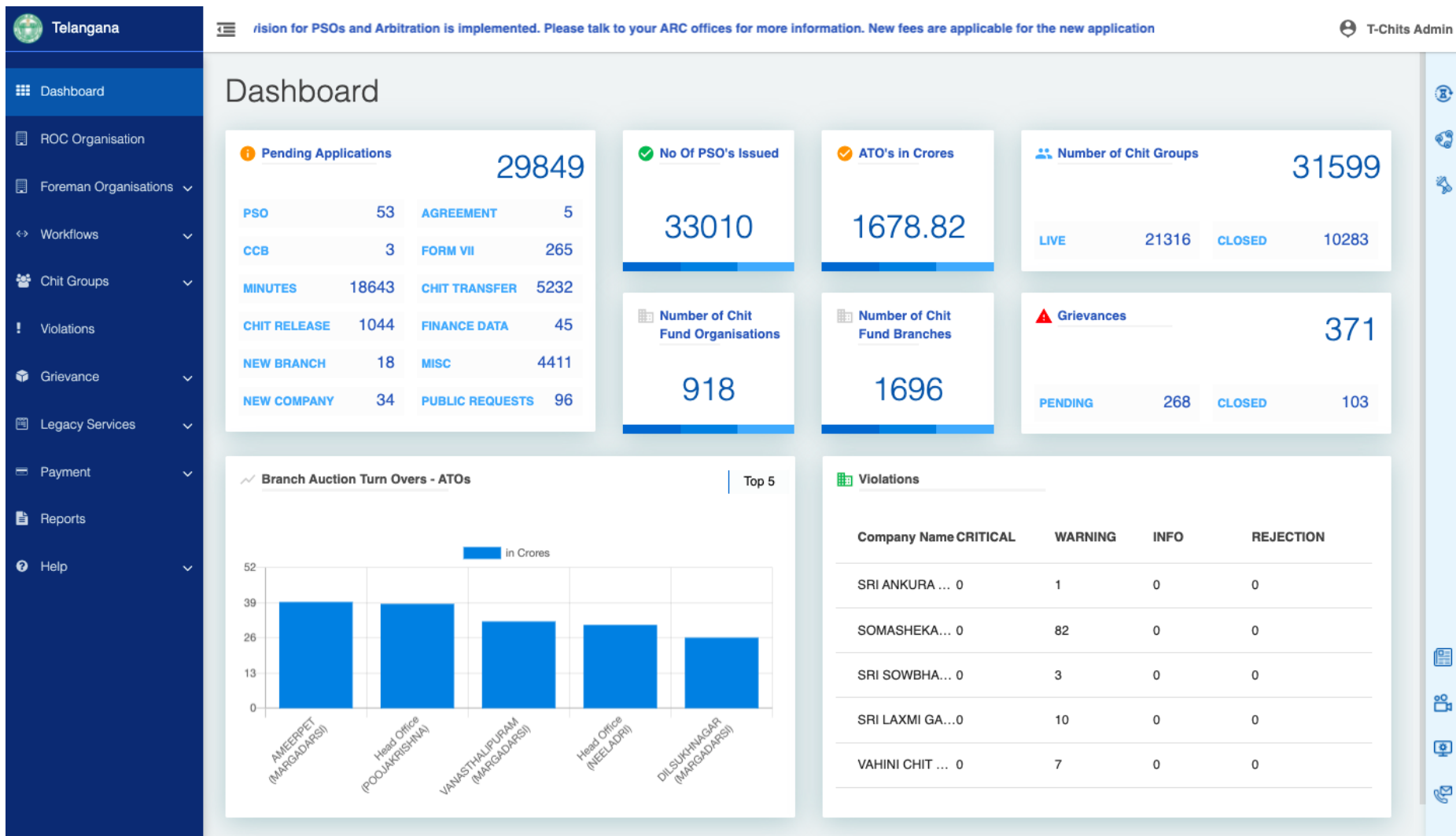


15,45,723
+
Transactions

Awarded Gold @ National level for “Excellence in implementing Emerging Technologies” in 2020



Post Implementation – Screen 1 – Single View Dashboard



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Real-Time Digital Authentication of Identity (RTDAI)

User's Live Photograph



1



AI based Liveness Check

Captured Photograph



Image form fetched
from Pension data
base



2



Deep learning based Image
Comparison

Captured Demographic Info

Input Name
Pensioner's ID (PPOID)
Registered Bank A/c No.

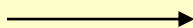
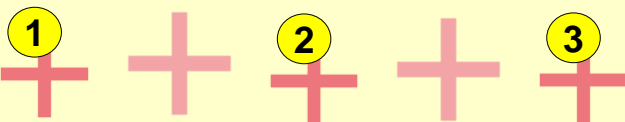
Name from
Pension
Database



3

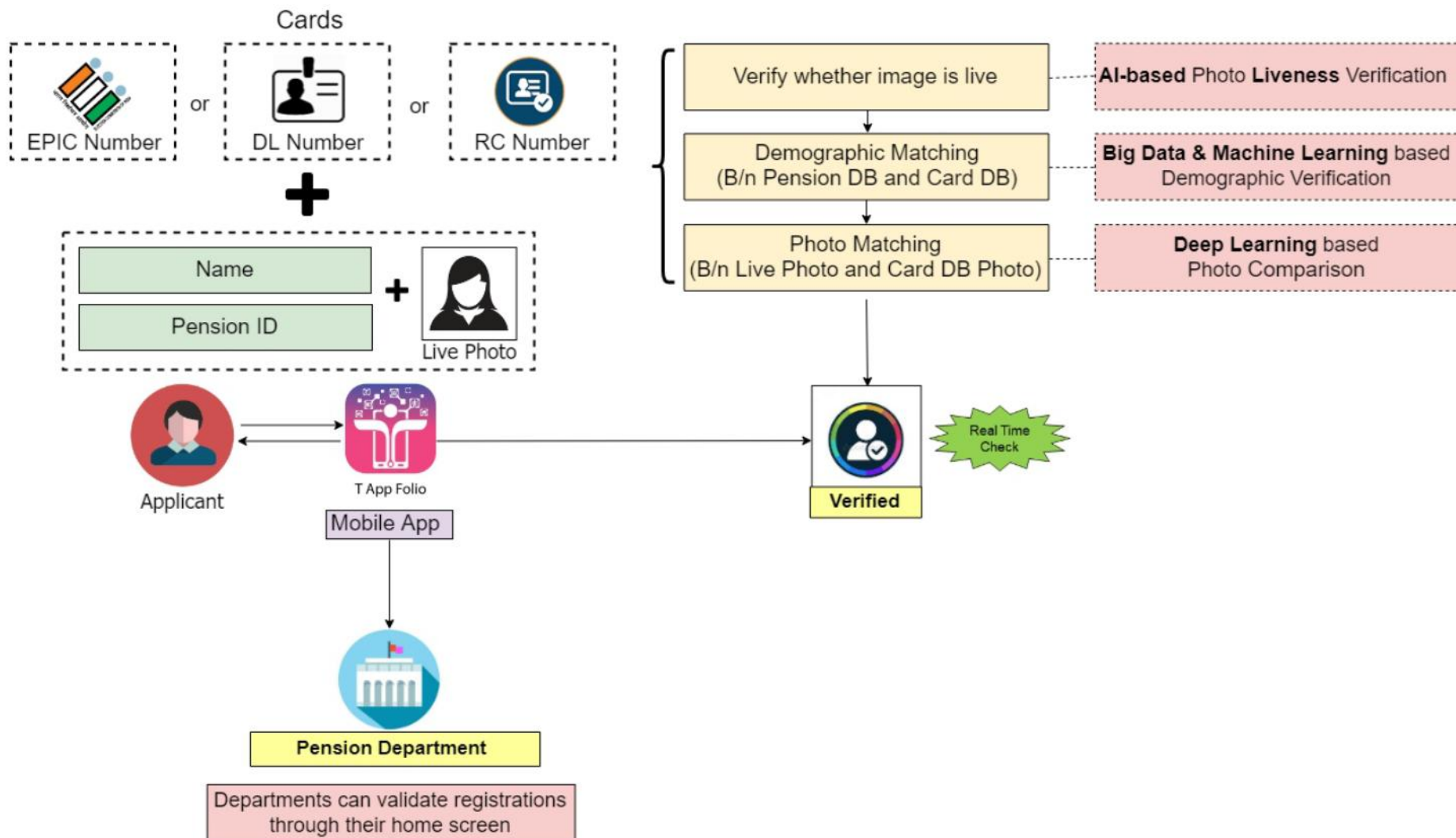


ML based Demographic Comparison



3 Factor authentication is treated
as digital authentication

Use of RTDAI for Pensioner's Life Certificate.



Need for 360 Degree view for all Enforcement agencies

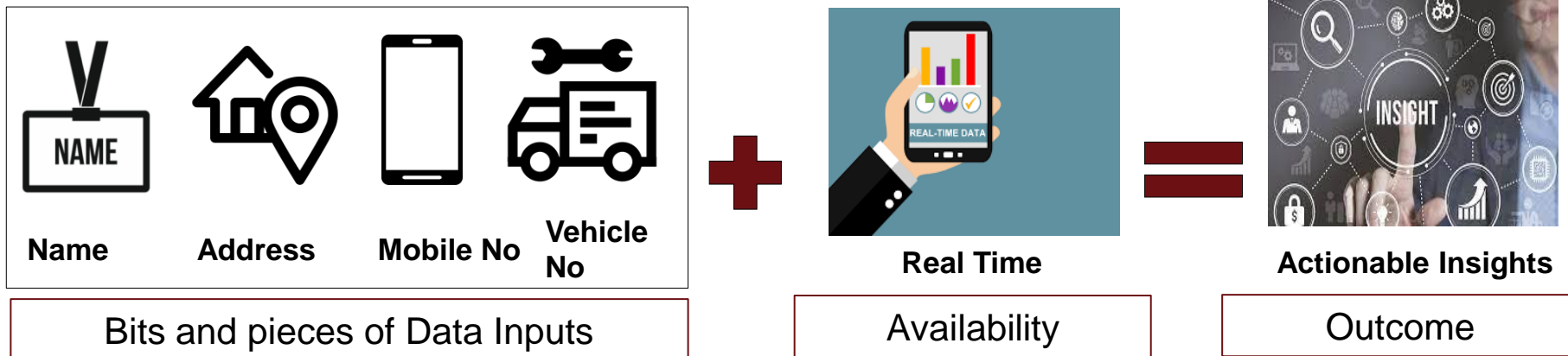
360° view / single source of Truth/ One View

Drive home the message:

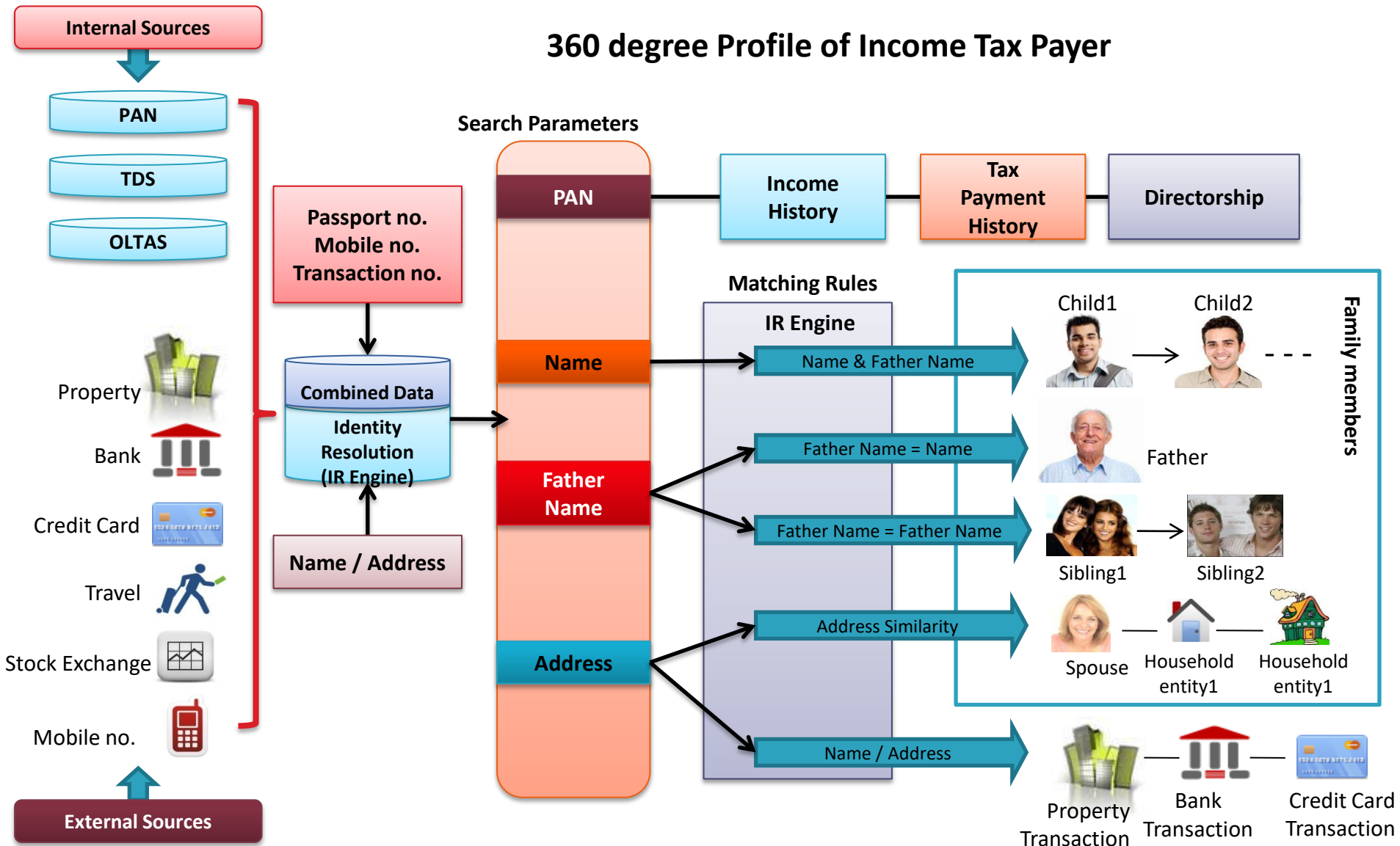
'I saw what you did, and I know who you are'



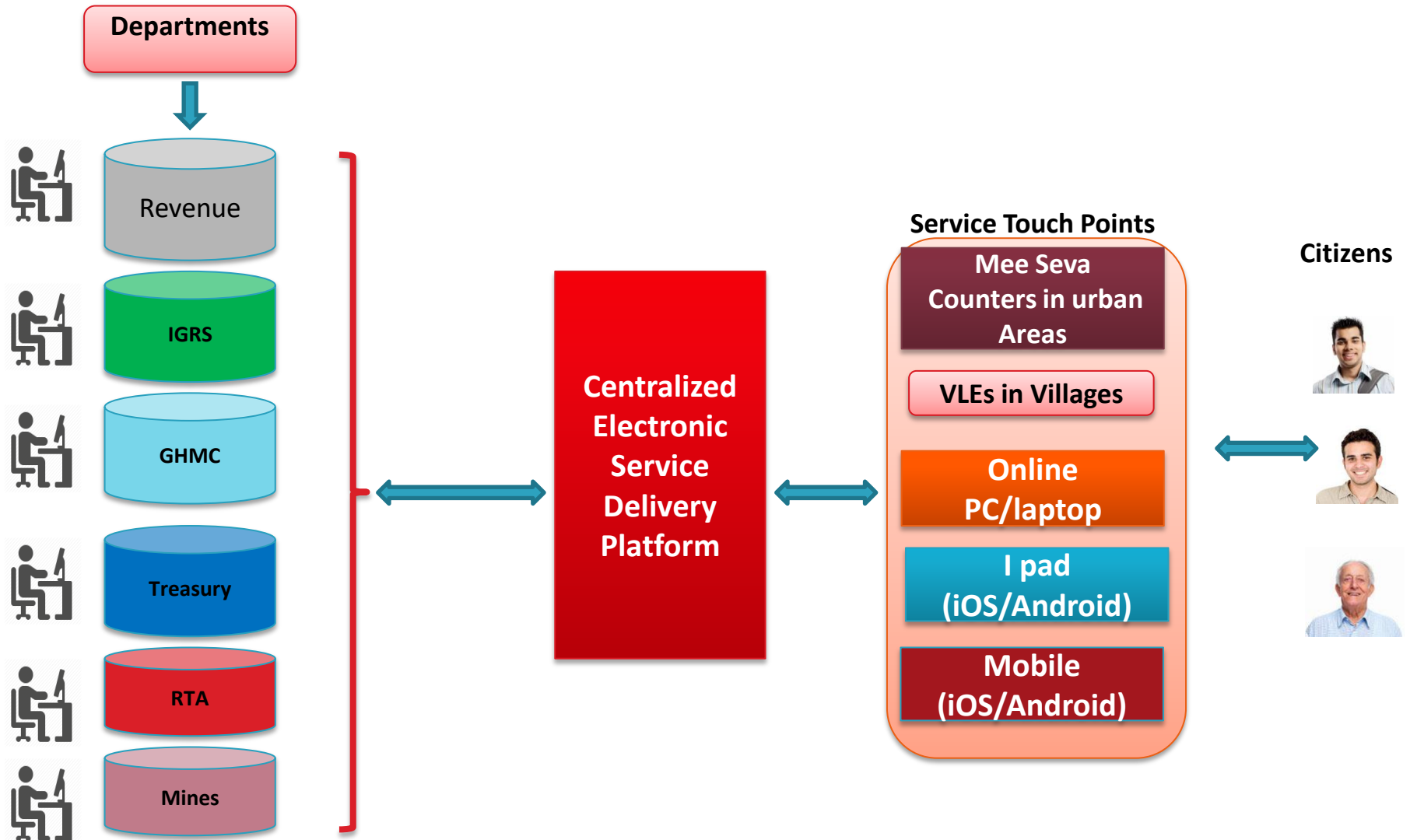
- Bits and pieces of information of person of interest, e.g., name and address, cell number, vehicle number etc should be used to get complete picture
- Includes identifying related persons and entities

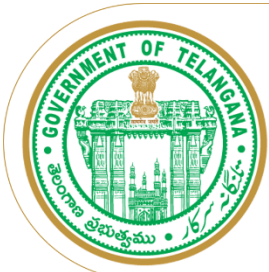


Telangana's Samagra Vedika: Example of 360 profile for Income Tax



MeeSeva, launched in 2011, has redefined citizen service delivery by bringing ~ 600 + services of 60 departments on one platform.





EMERGING TECHNOLOGIES ITE&C DEPARTMENT

Thank You!

**We believe that technology is an enabler that can
transform lives**

...

Rama Devi
Director, Emerging Technologies & OSD
ITE&C Department, Govt of Telangana
Osd_itc@telangana.gov.in
9849907639

T-Wallet can be used to make payments for 1126 services from 27 Departments / Agencies



Highlights

1. T-Wallet was launched on Jun 1, 2017 and is continuing
2. Citizens can use T-Wallet to make **cashless payments for both Government payments and Private Bills** to avail services
3. T-Wallet serves through Online (Desktop, laptop), **Smart Phone, Feature Phone and even No. phone** with multi-language support
4. Citizens with feature phone or no. Phone can use Meese centres, PDS Ration Shops to open T-Wallet, Load money into wallet and making payments
5. Used for **Bidirectional transfer of amount from Government to Citizens**
6. Only digital wallet, where cash can be withdrawn. **Special approval from RBI**



Key Pillars of Modified Service Delivery

Point of decision of service is separated from Point of delivery of Service by creating a large number of Franchisees as points of delivery

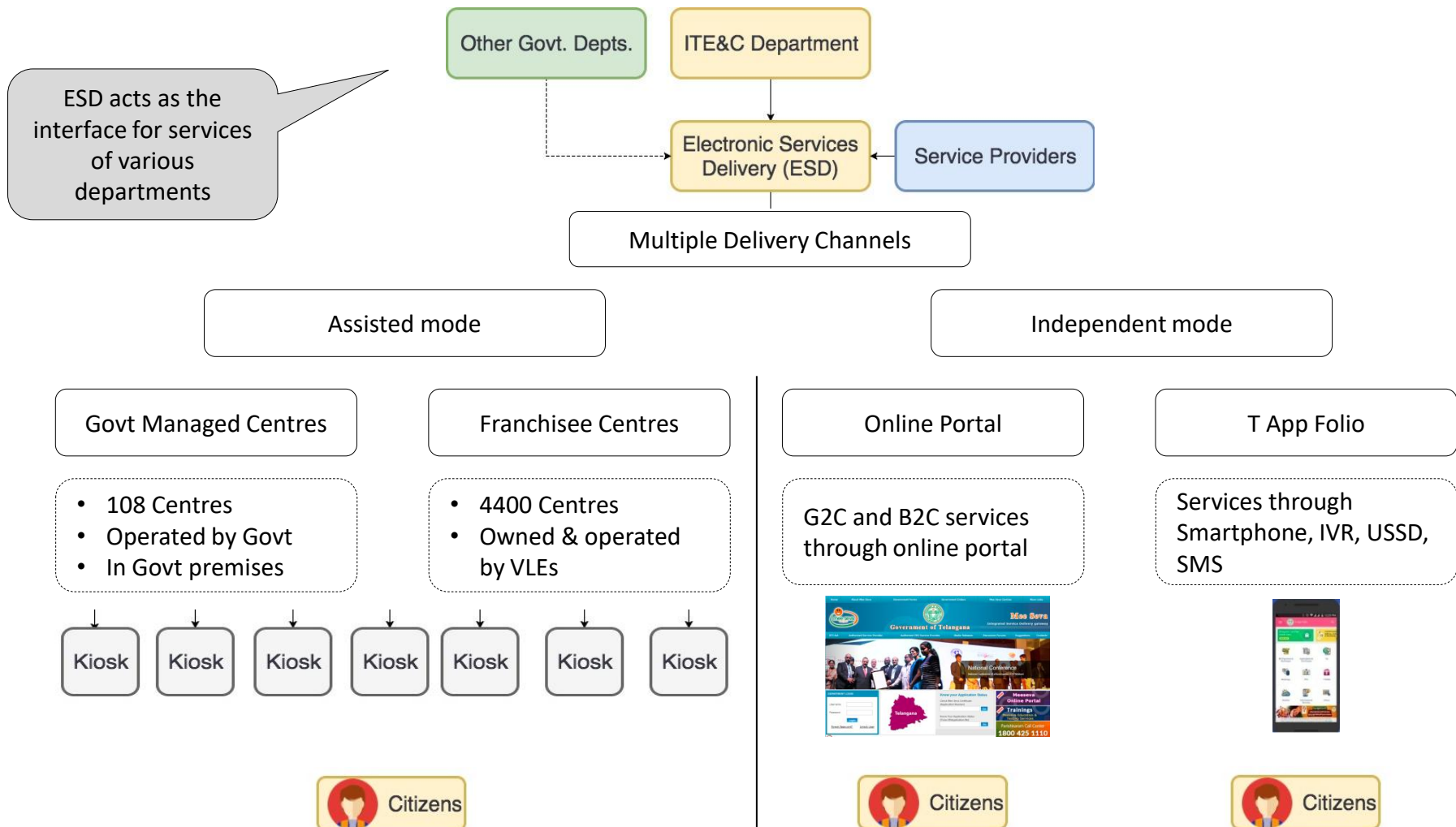
Jurisdiction less service

Contactless and Faceless Bureaucracy

**Centralized and connected ICT Platform to avoid duplication and separate interactions with different departments
SDC State Data Center, SWAN State Wide Area Network**

Strong system of Financial reconciliation since the taxes that come to the government are collected at Multiple points by private persons

ESD, Dept of ITE&C, acts the interface between citizens and government depts. for service delivery



Impact

Subscribers

- Chit funds are more Accessible and Credible
- An inclusive financial services system which really helps them
- Grievance redressal has become completely transparent

Regulators

- Chit funds compliances are monitored effectively and blockchained
- Violations are automatically raised and enforced by the system
- Monitoring of Prize Money disbursements have become easy

Foreman

- Audit and reporting compliances are managed easily
- Innovate on different business models driven by digitization
- Increased efficiency and operational benefits