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

How is Telangana shaping Digital Transformation through Emerging Technologies?

An Overview...

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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.

1. Nurturing a conducive ecosystem

   - Actionable Policy Framework
   - Implementing Bodies

2. Adoption in Government

   - Use-case Identification
   - Innovative Solutions
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
- E-Waste CoE
- Blockchain District
- Telangana AI Mission (T-AIM)
- National Centre for Additive Manufacturing

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.

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 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.

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

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.

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)
- Seed Traceability
- Pest Detection in Cotton with advisories
- eVoting
- Medicine from the Sky
- Afforestation by Seed Bombing
- Flood Modelling

A flagship multi-stakeholder project, now renamed as “Saagu Baagu”
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The initiatives in AI started with the launch of 2020 as 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.

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
- Applied AI Research Centre (INAI) established at IIIT-H in partnership with Intel and PHFI
- March to Million Initiative by Microsoft and Nasscom FutureSkills
- Inauguration of HexArt Institute, India’s First AI Community Center
- State Partner for NASSCOM’s Xperience AI Summit
- AIC_CCMB TIDE 2.0 Ideathon for ICT in Life Sciences & Biotechnology
- Hack4Resilience Hackathon
- Representation in Responsible AI for Social Empowerment (RAISE 2020)
- AgriTech Grand Challenge to use AI for solving specific use-cases
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

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

### Medicine from the Sky

#### Use-Cases

- **T-MEDS** (mosquito eradication)
- **Hara Bahara** (Reforestation)
- **Power Lines Inspection**
- **Volumetric Analysis of Mines**
- **Precision Agriculture**

#### 1st State

- 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**

#### 3 Partners

- World Economic Forum
- NITI Aayog
- Apollo Hospitals

#### 8 consortia

- Conducted trials out of 16 applicants

<table>
<thead>
<tr>
<th><strong>Use-Cases</strong></th>
<th><strong>1st State</strong></th>
<th><strong>3 Partners</strong></th>
<th><strong>8 consortia</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>45 Days</strong></td>
<td><strong>350+ Flights</strong></td>
<td><strong>850+ Kms Travelled</strong></td>
<td><strong>500+ Kgs of Total Weight Lifted</strong></td>
</tr>
<tr>
<td><strong>510 Max Doses Lifted</strong></td>
<td><strong>10 Max Kg Lifted</strong></td>
<td><strong>36 Km/h Avg Speed</strong></td>
<td><strong>10,000+ Vaccines Doses Shipped</strong></td>
</tr>
</tbody>
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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**

- **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

**Desired Outreach**

- 100,000 Farmers
- 1,000 Villages
- 100 Farmer Collectives
- 4 Seasons
9 frameworks and 30 use-cases have been identified to create impact across the Agri value chain.

**Frameworks**

- Macro Crop Planning Models

**Intelligent Crop Planning**

- Pre-season Forecast of Demand, Supply & Prices
- Macro Crop Planning @ National & State levels
- Dynamic Sowing Windows for major crops
- Plans for Priority crops (Import-substitution, High-value & High-Nutrition)
- Pre-season guidance to input suppliers, credit & Insurance

**Smart Farming**

- Rapid Soil Analysis & eSHC
- Pest Prediction & Control
- Controls on application of inputs
- Smart micro irrigation
- Drone-based application of fertilizers & pesticides
- Smart Insurance
- Fintech
- eNWR
- Smart CCE, Yield Prediction

**Farmgate to Fork**

- AI, IoT-driven Smart Market
- Market Intelligence
- B2B Platform
- Hyper-local Connect (Farmer 2 Consumer)
- Farmer to Online Retail Network
- Quality Assessment
- Traceability
- Smart Logistics (Domestic & Export markets)

**Data Governance**

- Agri-data Exchange
- FAIR (for Interoperability)
- EFR (Electronic Farm Record)

*Startups are already providing these services (in 15/30 use cases)*
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).

<table>
<thead>
<tr>
<th>Crop</th>
<th>Districts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kharif</td>
<td>Nalgonda, Adilabad</td>
</tr>
<tr>
<td>Cotton</td>
<td>Khammam</td>
</tr>
<tr>
<td>Chilli</td>
<td>Jagtial</td>
</tr>
<tr>
<td>Turmeric</td>
<td>Nagarkurnool, Wanaparthy, Jogulamba</td>
</tr>
<tr>
<td>Rabi</td>
<td>Adilabad, Kamareddy, Nirmal</td>
</tr>
</tbody>
</table>

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

Illustration of Implementation Model

GoTS

Enabling Environment

- Access to Data
- Facilitation

Project Implementation Partner

EoI Applicant

Funding Agency

Consortium

- Deployment of emerging technologies for agriculture
- Help create a replicable and sustainable agritech model.

Note: The IP developed by PIP and consortium shall continue to be their property only.
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.

The above use cases have been filtered out of the IDEA and AI4AI initiatives.
### Minimum Viable Architecture of ADEX.

#### 2 Building Blocks

**DMP Governance Structure**

- **API Gateway**
  - Identity | Registration | Exit
  - Authentication | Authorization | IAM

- **Data-Explorer**
  - Metadata | Catalogues | Search Engine
  - Taxonomy | Data Characterization

- **Consent Manager**
  - Consent Management | Purpose of use

- **Transaction Manager**
  - Price Discovery | Contract Management
  - Metering | Invoicing | e-Payment | Audit trail

**Data Service Providers**

- ADEX App for Providers

**APIs**

- Data Providers

**Data Consumers**

- ADEX App for Consumers
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An E-Voting Platform has been designed around stakeholders and their roles.

<table>
<thead>
<tr>
<th>Citizens</th>
<th>Administrator (TSEC)</th>
<th>Returning Officer (RO)</th>
</tr>
</thead>
</table>
| • Registration  
  • Voting | Overall Administration  
  • Registration of Returning Officers (RO)  
  • Setting up of Voting and Registration Dates  
  • Generation of Reports | • Ward wise Ballot generation and signing  
  • Counting |

**Activities**
- AI, ML, etc. – 3 factor authentication
- Storage of votes on Blockchain to ensure immutable records

**Modules**
- Android App
  - Registration  
  - E-Voting
- Online Web Portal
  - Admin & RO Portal  
  - Counting
Fundamentals considered while designing the Solution.

### Citizen Authentication
3 Factor Authentication during registration:
- Name Matching with Aadhaar
- Liveness Detection of Individual
- Image Matching with EPIC Database

2 Factor Authentication during voting:
- Liveness Detection of Individual
- Image Matching with pre-matched registration photo

### Legitimate Voting
Preventing mis-use of digital voting:
- 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

### Ease Of Use
Simplistic Design
- Minimal and Clearly Defined Steps
- Detailed help section with tutorial videos
- Available in both English and Telugu

Assurance to citizen
- Confirmations prompts at each stage such as during name matching, pre-ballot, before casting vote, after casting vote, etc.
- Digital Audit Trail

### Security
Registration/Voting:
- 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

Admin/Counting:
- Ward-wise Votes decryption & validation based on authentication by RO (or authorized officer)
Demo and Sample UI.

Registration Module (Samples)

- Voting Smart Phone Verification
- Aadhaar Authentication
- Voter Verification
- Photo Upload

Enter EPIC number / Voter ID:
Ex: ABCDEFGHIJK

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

Do's
- Your Face to be at the center of the frame.
- No multiple faces.

Don'ts
- ✗
- ✗
- ✗

Click here to capture your photo

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

First Page

Photo Upload

Confirmation

Voting Module (Samples)

You are Voting as
Name: Patil Mahesh Uttam
EPIC Number: WKH0101139

Ballot

Confirm

Vote

1. RAJESH GUVIKARI
   9, 9985

2. VENUGALA RAYUDU
   9, 6554

3. SRI RAM
   9, 2345

4. MAHABHARATA
   9, 666

5. SUDHAKAR REDDY
   9, 2345

6. MAHESH BABU
   9, 2345
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T-Chits is being used for administration of Chit Funds that faced inefficiencies before owning 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

- **31,599**
  - + Groups

- **12,28,300+**
  - Subscribers

- **2,60,354+**
  - Blocks

- **All 14 regulator**
  - Offices Telangana

- **1696+**
  - Chit fund Offices

- **20,145.84 Cr+**
  - Monies rotated Per Annum

- **15,45,723**
  - + Transactions

**Awarded Gold @ National level for “Excellence in implementing Emerging Technologies” in 2020**
Post Implementation – Screen 1 – Single View Dashboard

Dashboard

Pending Applications: 29849
- PSO: 53
- CCB: 3
- MINUTES: 18643
- CHIT RELEASE: 1044
- NEW BRANCH: 18
- NEW COMPANY: 34

No Of PSO’s Issued: 33010
- AGREEMENT: 5
- FORM VII: 285
- CHIT TRANSFER: 5232
- FINANCE DATA: 45
- MISC: 4411
- PUBLIC REQUESTS: 96

ATO’s in Crores: 1678.82

Number of Chit Fund Organisations: 918

Number of Chit Fund Branches: 1696

Number of Chit Groups: 31599
- LIVE: 21316
- CLOSED: 10283

Grievances: 371
- PENDING: 268
- CLOSED: 103

Branch Auction Turn Overs - ATOs

Violations

<table>
<thead>
<tr>
<th>Company Name</th>
<th>CRITICAL</th>
<th>WARNING</th>
<th>INFO</th>
<th>REJECTION</th>
</tr>
</thead>
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<tr>
<td>SRI ANKURA...</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SOMASHEKA...</td>
<td>0</td>
<td>82</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SRI SOWBHHA...</td>
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<td>0</td>
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<tr>
<td>SRI LAXMI GA...</td>
<td>0</td>
<td>10</td>
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<td>0</td>
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<tr>
<td>VAHINI CHIT...</td>
<td>0</td>
<td>7</td>
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Real-Time Digital Authentication of Identity (RTDAI)

1. User’s Live Photograph
   - AI based Liveness Check

2. Captured Photograph
   - Image form fetched from Pension database
   - Deep learning based Image Comparison

3. Captured Demographic Info
   - Name from Pension Database
   - Input Name
     - Pensioner’s ID (PPOID)
     - Registered Bank A/c No.

ML based Demographic Comparison

3 Factor authentication is treated as digital authentication
Use of RTDAI for Pensioner’s Life Certificate.

- EPIC Number
- DL Number
- RC Number

- Name
- Pension ID

- Live Photo

- T App Folio
- Mobile App

- Applicant

- Pension Department

Departments can validate registrations through their home screen

- Verify whether image is live
  - AI-based Photo Liveness Verification

- Demographic Matching (B/n Pension DB and Card DB)
  - Big Data & Machine Learning based Demographic Verification

- Photo Matching (B/n Live Photo and Card DB Photo)
  - Deep Learning based Photo Comparison

Verified

Real Time Check
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

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
<th>Mobile No</th>
<th>Vehicle No</th>
</tr>
</thead>
</table>

Bits and pieces of Data Inputs

Real Time Availability Outcome

Actionable Insights
Telangana’s Samagra Vedika: Example of 360 profile for Income Tax

360 degree Profile of Income Tax Payer

**Internal Sources**
- PAN
- TDS
- OLTAS

**External Sources**
- Property
- Bank
- Credit Card
- Travel
- Stock Exchange
- Mobile no.

**Search Parameters**
- Name
- Father Name
- Address

**Matching Rules**
- IR Engine
  - Name & Father Name
  - Father Name = Name
  - Father Name = Father Name
  - Address Similarity
  - Name / Address

**Combined Data**
- Identity Resolution (IR Engine)
- Passport no.
- Mobile no.
- Transaction no.

**Passport no.**
- Mobile no.
- Transaction no.

**Family members**
- Child1
- Child2
- Father
- Sibling1
- Sibling2
- Spouse
- Household entity1
- Household entity1
- Property Transaction
- Bank Transaction
- Credit Card Transaction
MeeSeva, launched in 2011, has redefined citizen service delivery by bringing ~ 600 + services of 60 departments on one platform.
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

- **Assisted mode**
  - Govt Managed Centres
    - 108 Centres
    - Operated by Govt
    - In Govt premises
  - Franchisee Centres
    - 4400 Centres
    - Owned & operated by VLEs

- **Independent mode**
  - Online Portal
    - G2C and B2C services through online portal
  - T App Folio
    - Services through Smartphone, IVR, USSD, SMS

ESD acts as the interface for services of various departments
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