

# DIGITAL PUBLIC INFRASTRUCTURE

A photograph of two women from the waist up. The woman on the left is wearing a pink and red headscarf and a grey top, and is looking down at a blue smartphone held in her hands. The woman on the right is wearing a yellow headscarf and a yellow top, and is looking towards the camera with a slight smile. They are standing in front of a dark, vertical-slatted wooden wall.

# 8<sup>th</sup> Foundation Course for MES Officers

**Srinivas Bhoosarapu**

**Information and Cyber Security Researcher ,  
Former CISO and Chief FinTech and Innovation Officer**

# Digital Transformation & Emerging Technologies

**Srinivas Bhoosarapu**

**Information and Cyber Security Researcher ,  
Former CISO and Chief FinTech and Innovation Officer**

# Agenda

- **Design Thinking , Digital Transformation**
- **Digital Public Infrastructure (DPI)**
- **Emerging Digital Technologies for DPI**
- **AI/ML/DL/GenAI**
- **Quantum Computing**
- **Blockchain Technology/IoT**
- **MES Future Integration Challenges and Opportunities**
- **Conclusion**

# Digital Transformation

- **Digital Transformation:** It is the process of using digital technologies to create new — or modify existing — business processes, culture, and customer experiences to meet changing business and market requirements.



# Digital Transformation – eGov in MES



WEB BASED PROJECT MONITORING PORTAL



PRODUCT APPROVAL PORTAL



INAUGURATION OF WBPMP



BUDGET MANAGEMENT PORTAL



LAUNCH OF e-MB & MIMAMSA

FOSTER TRANSPARENCY

BUILD EFFICIENCY

UNLOCK LATENT PRODUCTIVITY

EFFECTIVE MONITORING BY STAKEHOLDERS

ENABLE REPOSITORY OF INFORMATION AT  
THE CLICK OF THE BUTTON



INAUGURATION OF DWAP



CONTRACTOR AND CONSULTANT  
ENLISTMENT PORTAL



ELECTRONIC MEASUREMENT BOOK (e-MB)



MES INTEGRATED MONITORING AND MGT  
SOFTWARE FOR ARBITRATION (MIMAMSA)



190 E-TRAINING MODULES – DD DIGISHALA

Automation Cell

- For uploading on MES website with open access.

# Digital Transformation – eGovernance

To manage infrastructure, construction, and engineering support for the armed forces, covering civil, electrical, mechanical, and IT domains

**Budget Management Portal**

**Contractor & Consultant Enlistment Portal**

**Electronic CashBook**

**Electronic Measurement Book**

**Product Approval Portal**

**Project Monitoring Portal**

**Work Estimation Application**

**e-Governance Portal**

**Defence Works Assets Portal**

**MIMAMSA**

# Digital Transformation – IFA in MES

Tele: 23019638  
*24AB*

E2 Works (PPC) Sub Dte  
Dte of Works, E-in-C's Branch  
Integrated HQ of MoD (Army)  
Kashmir House, Rajaji Marg,  
New Delhi – 110011.

A/37696/Gen/Pol/E2W (PPC)

14 Mar 2024

**List 'A & B'**

**IMPLEMENTATION OF INTERGRATED FINANCIAL ADVICE SYSTEM –  
(IFA SYSTEM) IN MES**

A copy of CGDA letter No IFA/03/IFA Setup-MES/CR/2024 dated 06 Mar 2024 is forwarded herewith for your information and necessary action please.



(Sunil Kumar)  
Col  
Dir (PPC)  
For E-in-C

**Enclosure:** As above.

**Internal**

**Automation Cell** - For uploading on MES website with open access.

# Digital Public Infrastructure (DPI)

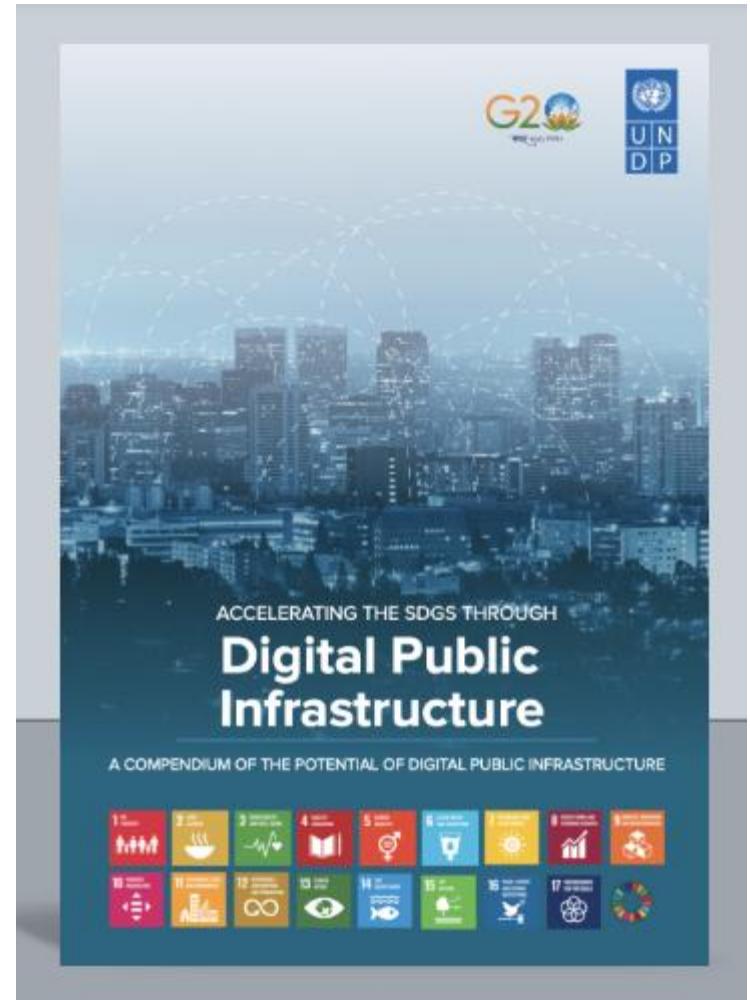
Digital public infrastructure (DPI) is a system of digital services, tools, and technologies that help governments, organizations, and other stakeholders facilitate a digital transformation of the society.

DPI can be compared to roads, which connect people and provide access to goods and services.

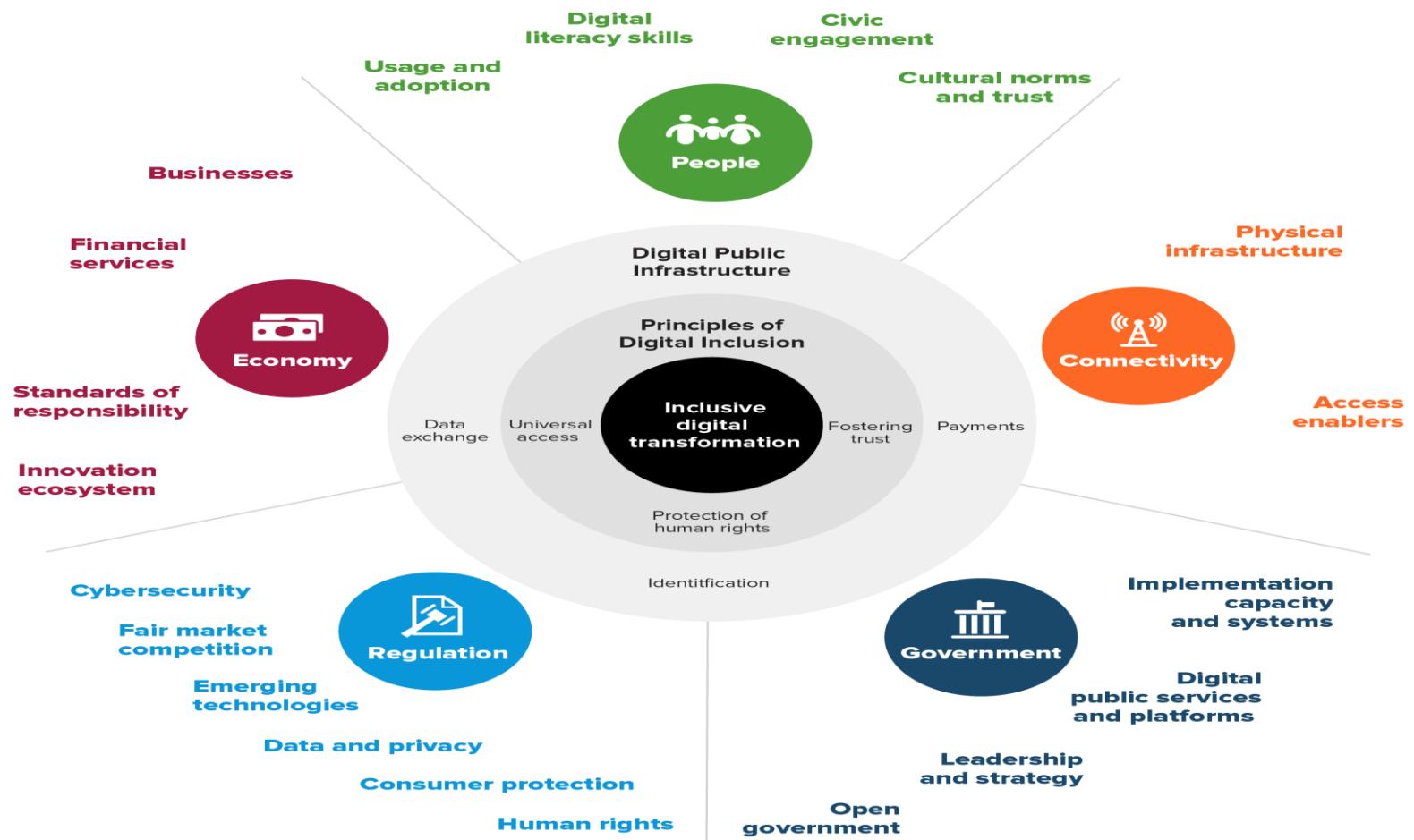
DPI can help countries provide economic opportunities and social services to residents.

# Digital Public Infrastructure (DPI)

Digital Public Infrastructure (DPI) has emerged as a critical enabler of digital transformation and can turbocharge progress to deliver on the SDGs.

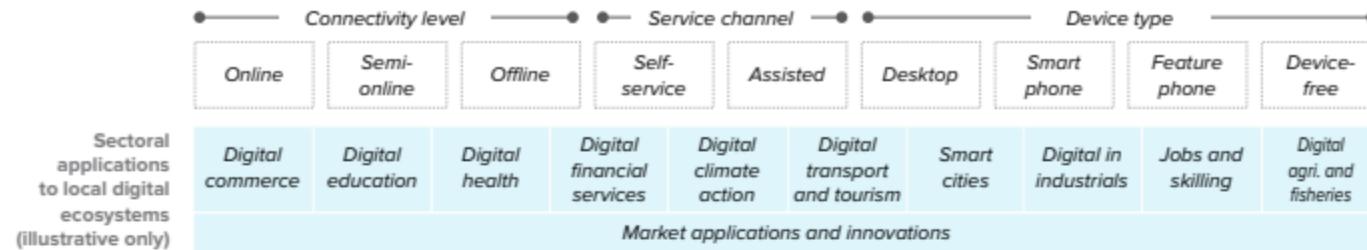


# Digital Public Infrastructure (DPI) - Enabler



# DPI Framework

*A framework to understand the DPI approach*



Core DPI<sup>6</sup> tech  
Others categories

Unlock DPI  
potential through:

Digital identity

Digital payments

Consent-based data sharing

Others emerging

open-source software, open Application Programming Interfaces (API) and the standards that support them, including open standards that enable different DPI to communicate<sup>7</sup>

Core DPI  
governance  
foundations

Strategic leadership  
to set long-term ambition, align policy and financing

Independent and accountable institutions  
to prevent misuse by actors

Policy framework  
to promote inclusion and innovation

Legislative and regulatory framework  
to maintain competition, resolve disputes and encode respect for privacy

Engagement and collaboration  
with end users and ecosystem actors to improve system performance

Technical expertise  
to provide sovereign overview, set standards and ensure interoperability

# Components of DPI Framework

**Broadband Connectivity:** Ensuring high-speed internet access to all citizens, including those in rural and underserved areas, to bridge the digital divide and promote digital inclusion.

**Digital Identity:** Establishing secure and reliable systems for digital identity verification, authentication, and authorization, which are essential for accessing online services and conducting digital transactions securely.

**Open Data Initiatives:** Making government data and information freely available to the public in digital formats, promoting transparency, accountability, and innovation.

**Cybersecurity Measures:** Implementing robust cybersecurity protocols and frameworks to protect digital infrastructure, data, and privacy from cyber threats and attacks.

# Components of DPI Framework

**Digital Service Delivery Platforms:** Developing user-friendly online platforms and portals for delivering government services and engaging with citizens digitally, enhancing efficiency and accessibility.

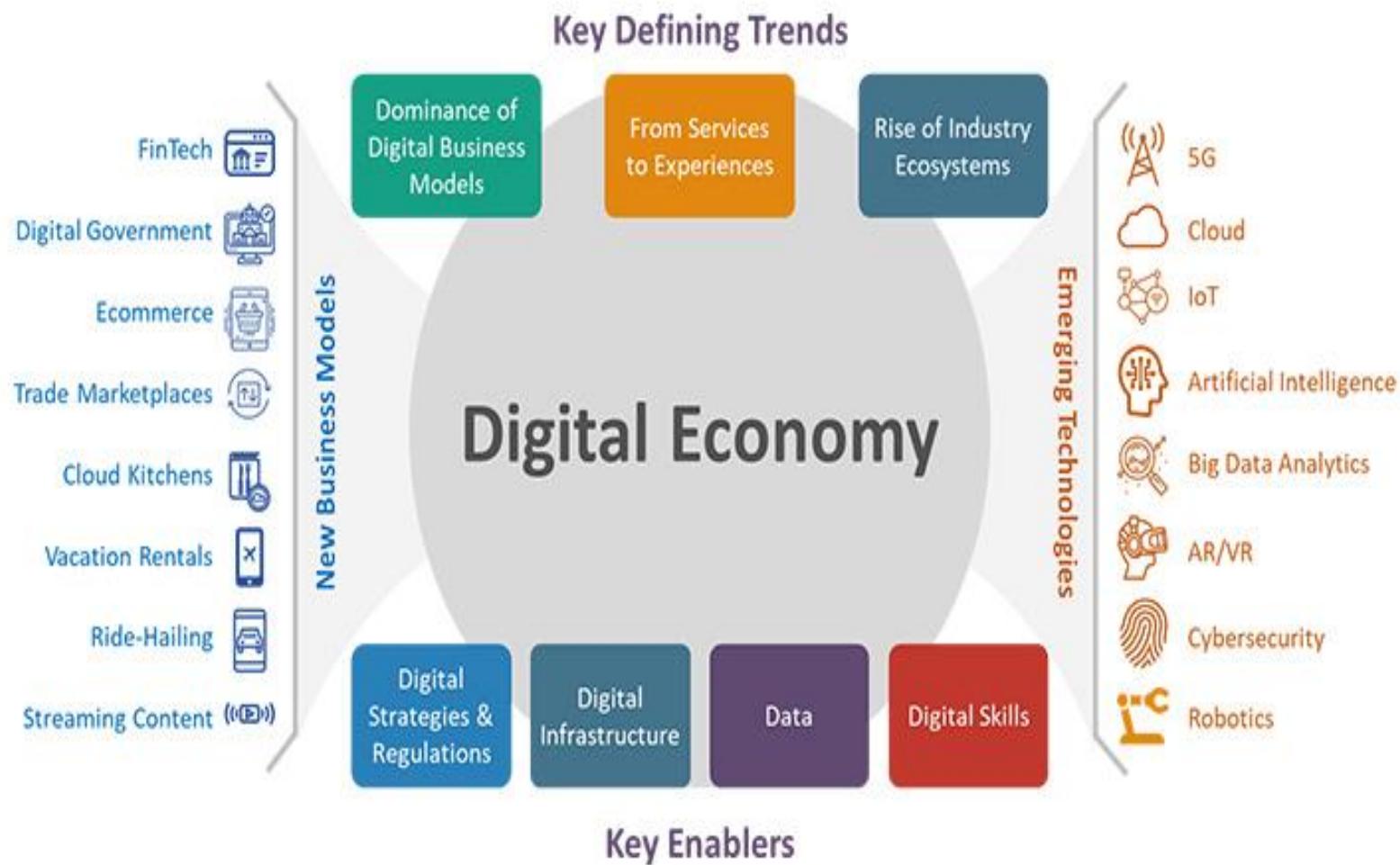
**Interoperability Standards:** Establishing standards and protocols to ensure compatibility and seamless integration between different digital systems and services, enabling data sharing and interoperability.

**Digital Literacy and Skills Development:** Promoting digital literacy and skills development initiatives to empower citizens to effectively use digital technologies and participate in the digital economy.

# Economy - DPI

- Market economy - Goods and services, demand and supply, credit or debit. (GST, TREDS, Digital Lending, Banking)
- Planned economy - Produced, sold and distributed. (eNAM)
- Green economy - Low-carbon and resource efficient. (eV Vehicles)
- A gig economy - Short-term jobs are assigned or chosen on-demand. (Swiggy, Flipkart )
- An informal economy - neither taxed nor monitored. (NCS,NREGS,UID)
- The knowledge economy - services, finance, and technology. (BPOs, KPOs)

# DPI Economy

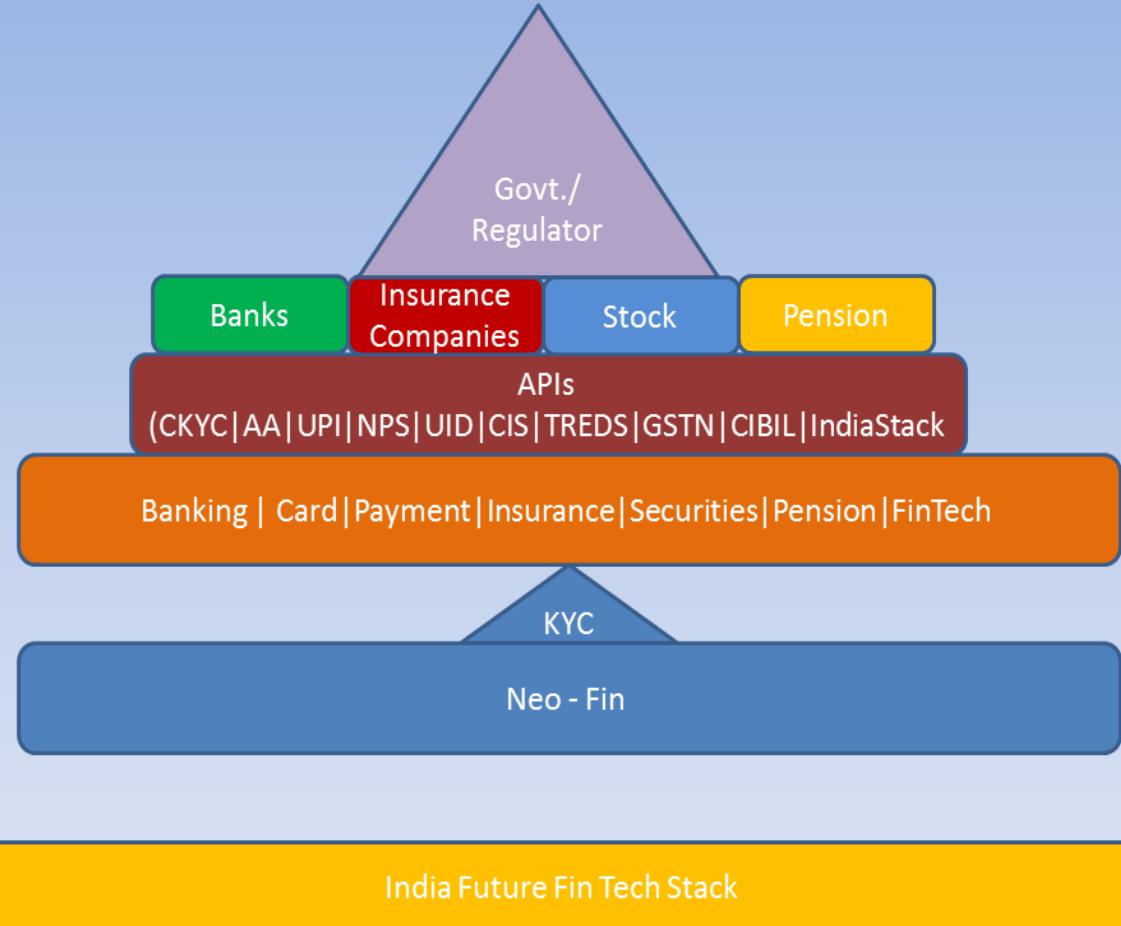


# Technologies - Digital Transformation

- Digital Transformation
- Big Data
- Data Science
- Data Analytics
- Decision
- Algorithms
- AI/ML

 IPV6	 5G/6G/LoRaWan	 Unified Communications	 Mobile	 Social
 Analytics	 Cloud	 Edge Computing	 Quantum Computing	 Internet of (Nano) Things
 Metaverse/ Mixed Reality (VR/AR)	 Blockchain	 Digital Twins	 Cyber Security	 Geospatial
 User Experience	 Unmanned Vehicles	 Robotics	 AI/ML/DL	 3D Printing
 Bioplastics for a circular economy	 Social robots	 Metalenses	 Disordered proteins as drug targets	 Smarter fertilizers
 Collaborative telepresence	 Advanced food tracking and packaging	 Safer nuclear reactors	 DNA data storage	 Utility-scale storage of renewable energy

# Digital Public Infrastructure

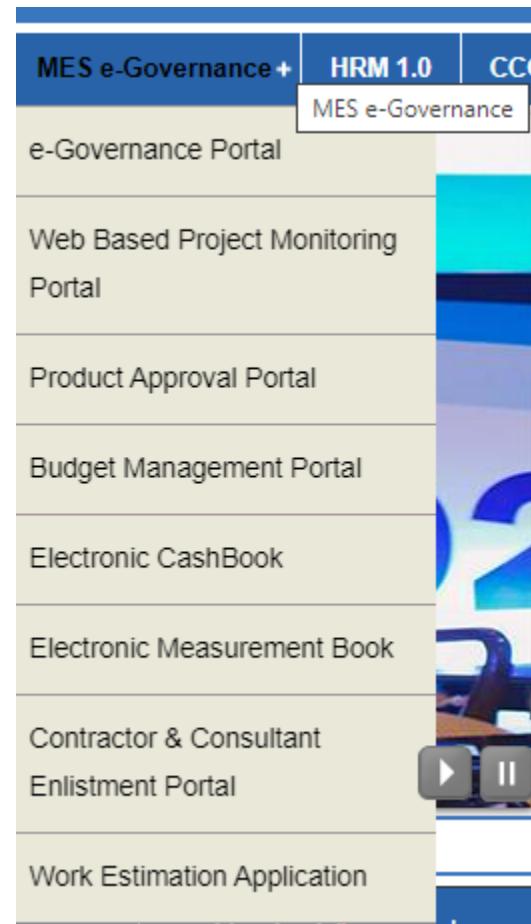


# Digital Public Infrastructure - MES

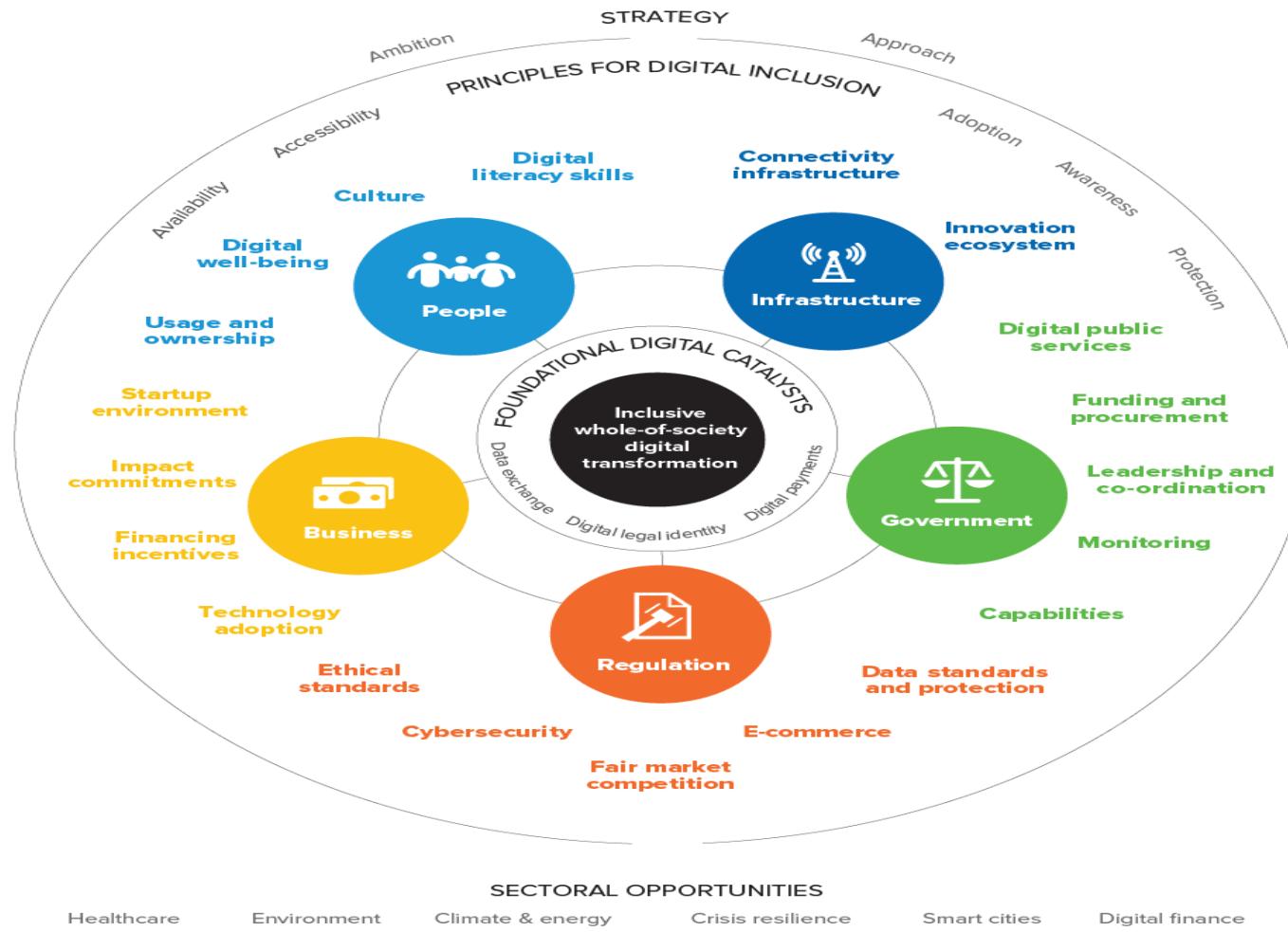
	Tech E-Trg Videos		Photo Gallery
	Postings / Promotions		Recruitment Circulars
	Seniority Lists		Training and Courses
	E8 Contracts	 PARTS LIST	Technical Information
	Technical Drawing Restricted		Technical Drawings
	Technical Examination		Design Misc

# MES - eGov

**MES - eGov**



# Sectorial Opportunities



## IndEA Govt. Context

IndEA

*... for ONE Government*

# IndEA

The Vision of IndEA is “*to establish best-in-class architectural governance, processes and practices with optimal utilization of ICT infrastructure and applications to offer ONE Government experience to the citizens and businesses*”.

## The IndEA Vision

### IndEA Vision

*ONE Government*

### IndEA Principles

### IndEA Reference Models

#### GoI Ministries

#### States & UTs

#### PSUs

Interoperability

Shared Infra

Common Applications

Open Standards

TECHNOLOGY

- Unified & Uniform Interfaces
- Citizen/ Business-centric Services
- Guaranteed Service Levels
- Effective Program Management
- Less Government, More Governance
- Security & Privacy

STAKEHOLDER BENEFITS

SDG Approach

Prioritization

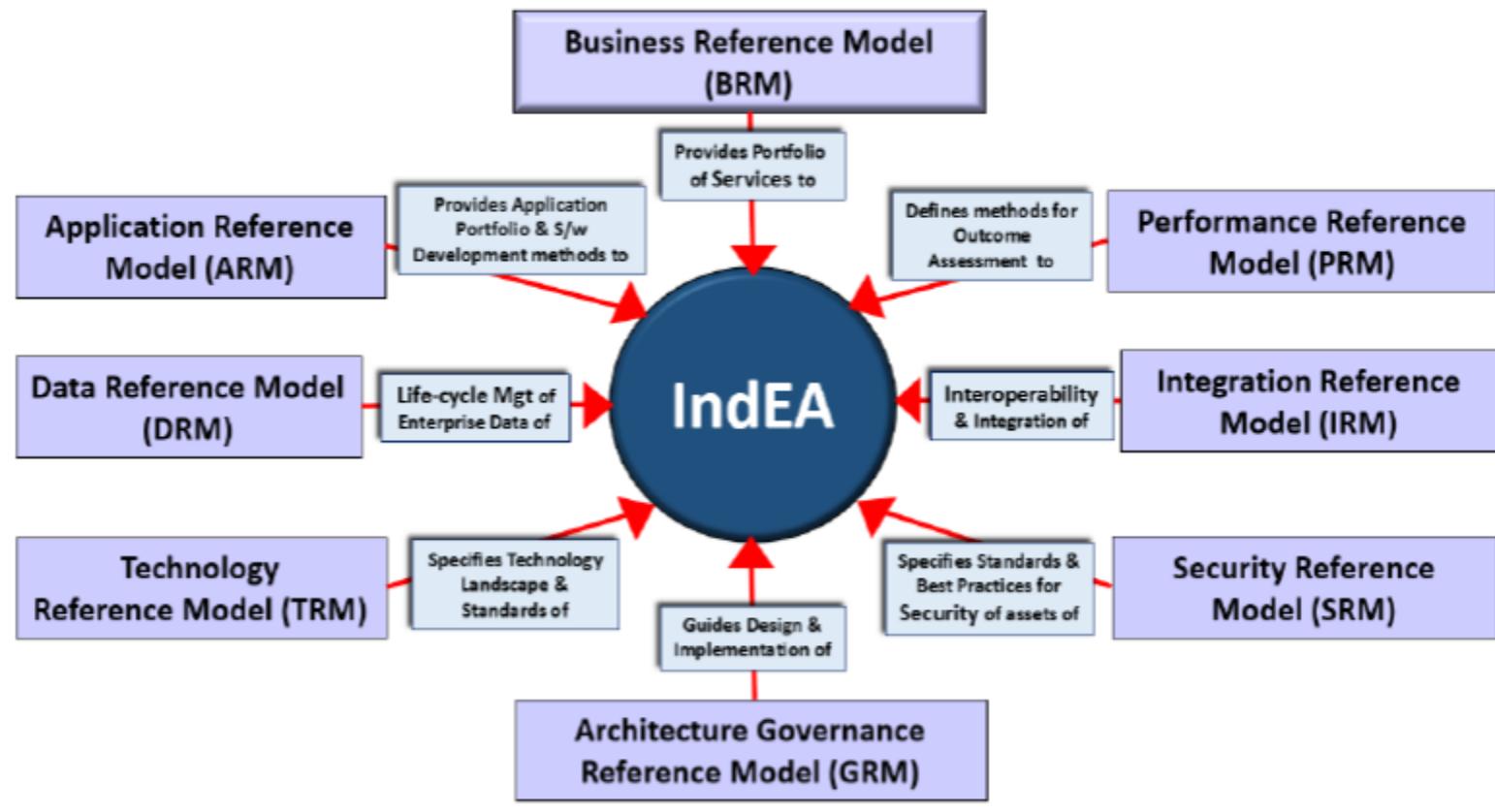
Process Re-engineering

Change Mgt

PROCESS / PEOPLE

# IndEA Reference Models

## The 8 Reference Models of IndEA



# Digital Public Infrastructure

- **UIDAI**
- **OCEN**
- **CCTNS**
- **NeHA**
- **India Stack**
- **TREDS**
- **OPEN DATA**
- **National Cloud (Megharaj)**
- **NCS**

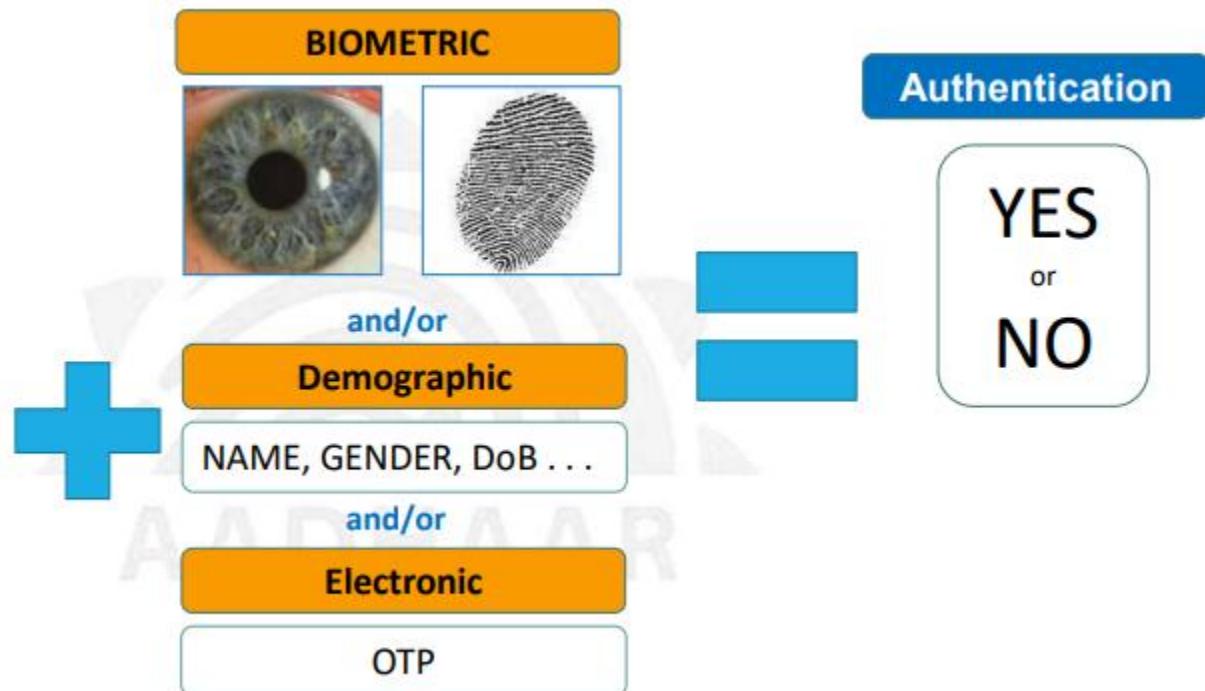
**ONDC**  
**GSTN**  
**NFS/UPI/NACH /BBPS**  
**NDEAR**  
**CKYC**  
**NSAP**  
**NPS**  
**GeM**  
**TPDS**

# UIDAI - Identity



आपकी आधार संख्या / Your Aadhaar No.

1111 2222 3333



# UIDAI - Authentication



आपकी आधार संख्या / Your Aadhaar No.  
1111 2222 3333



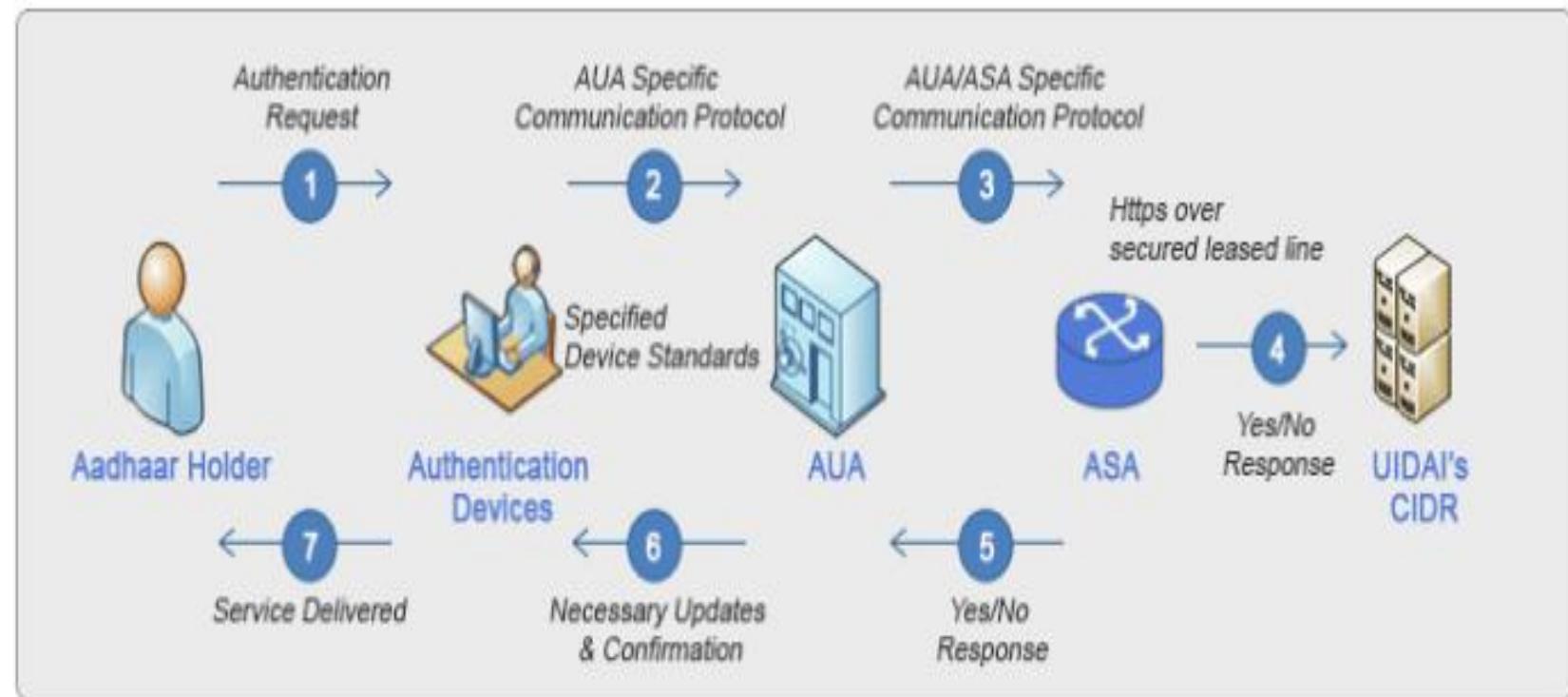
## E-KYC

- Name
- Date of Birth
- Gender
- Address
- Photograph
- Phone\*
- Email\*

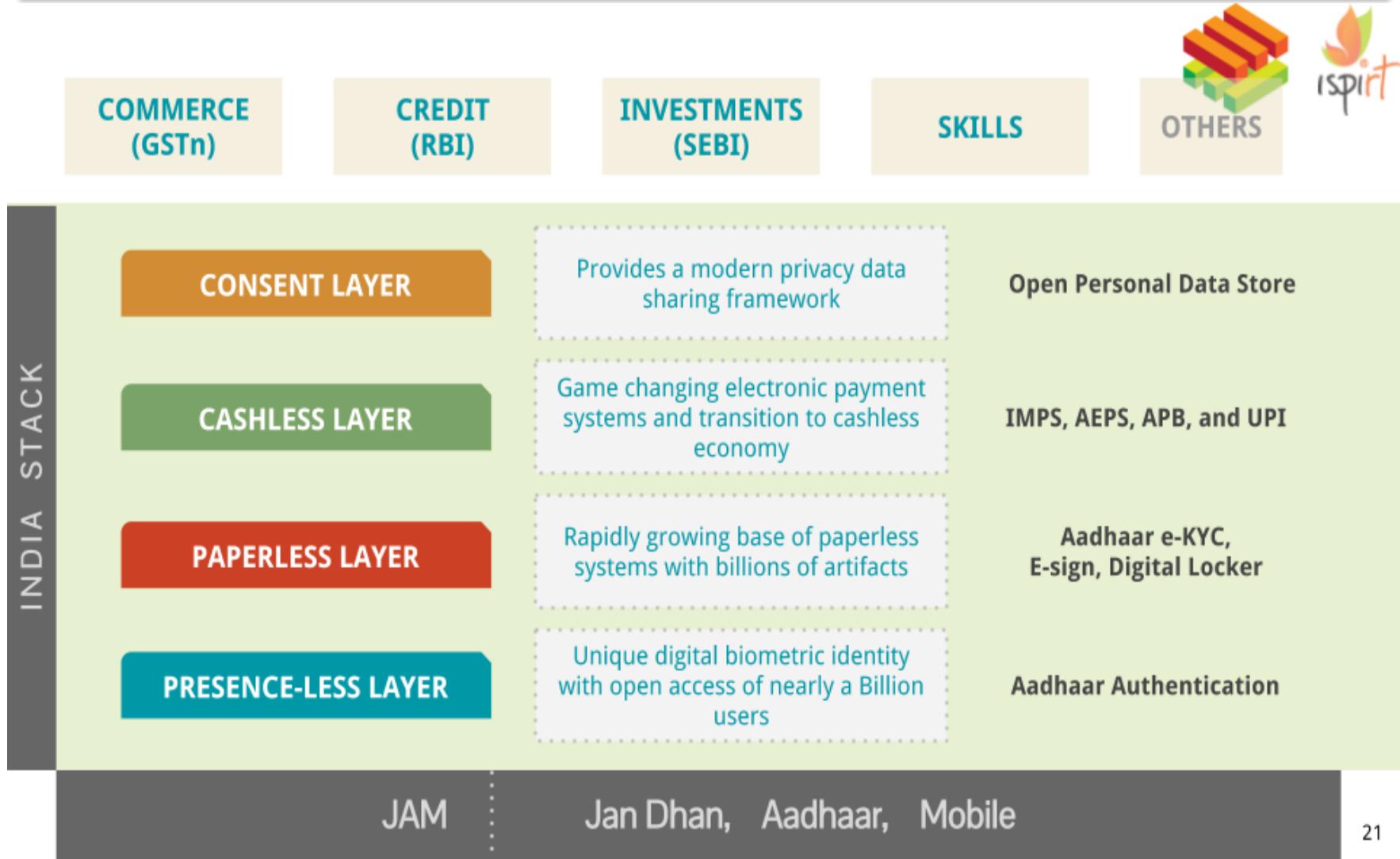
### Advantages

- Consent based & convenient
- Secure & compliant with IT Act 2000
- Digitally signed by UIDAI thus non-repudiable

# UIDAI - Authentication



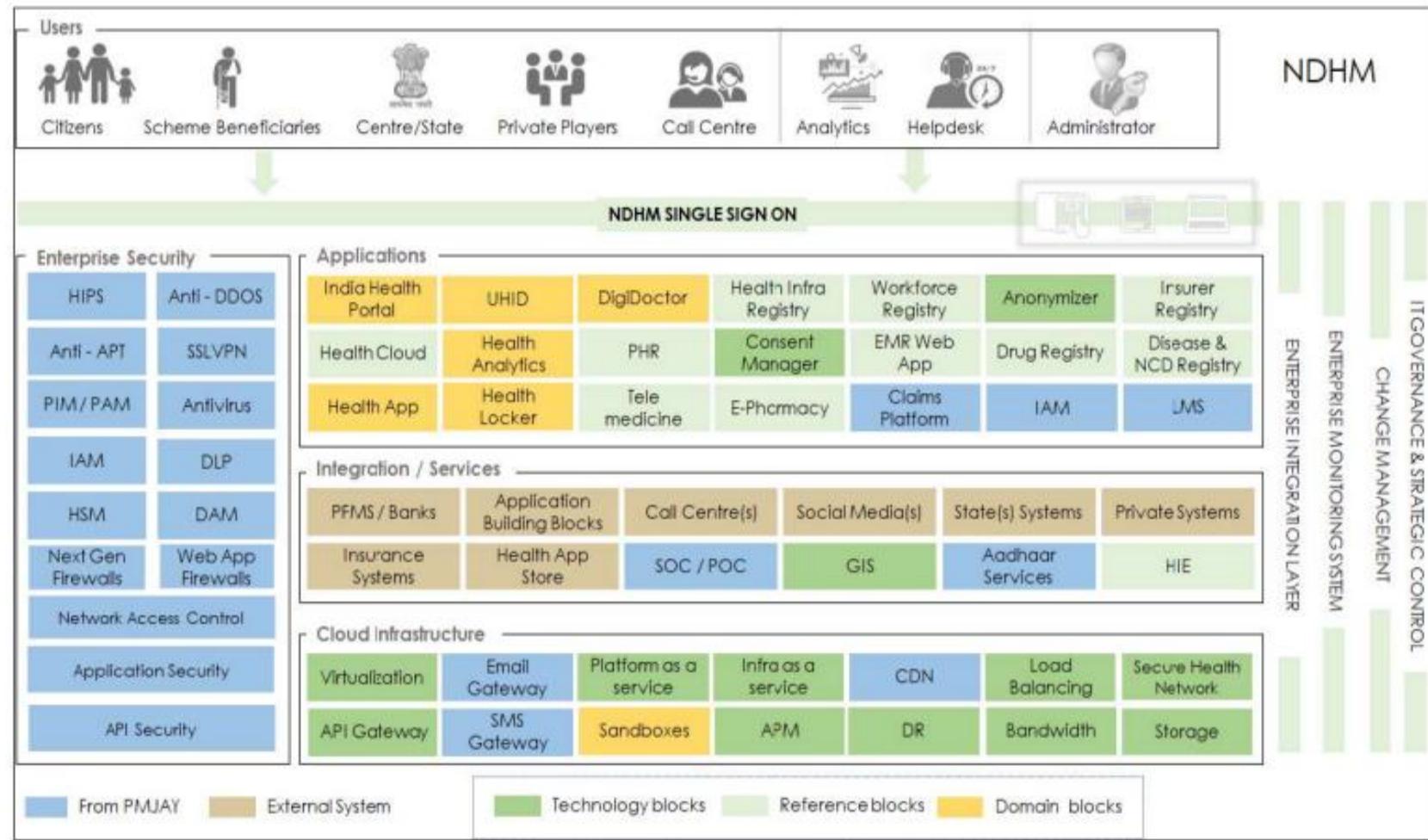
# India Stack



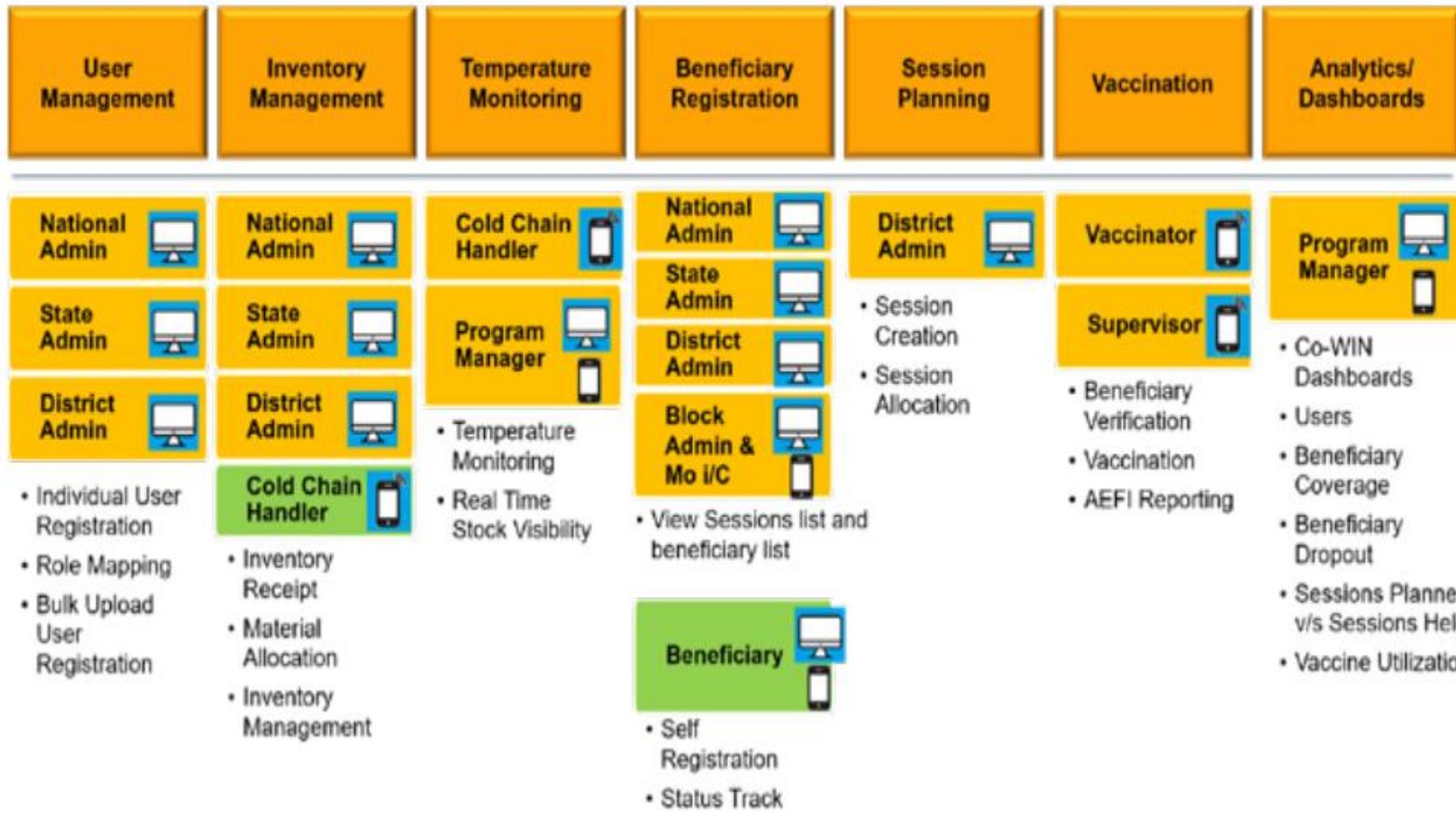
# Digital Commerce



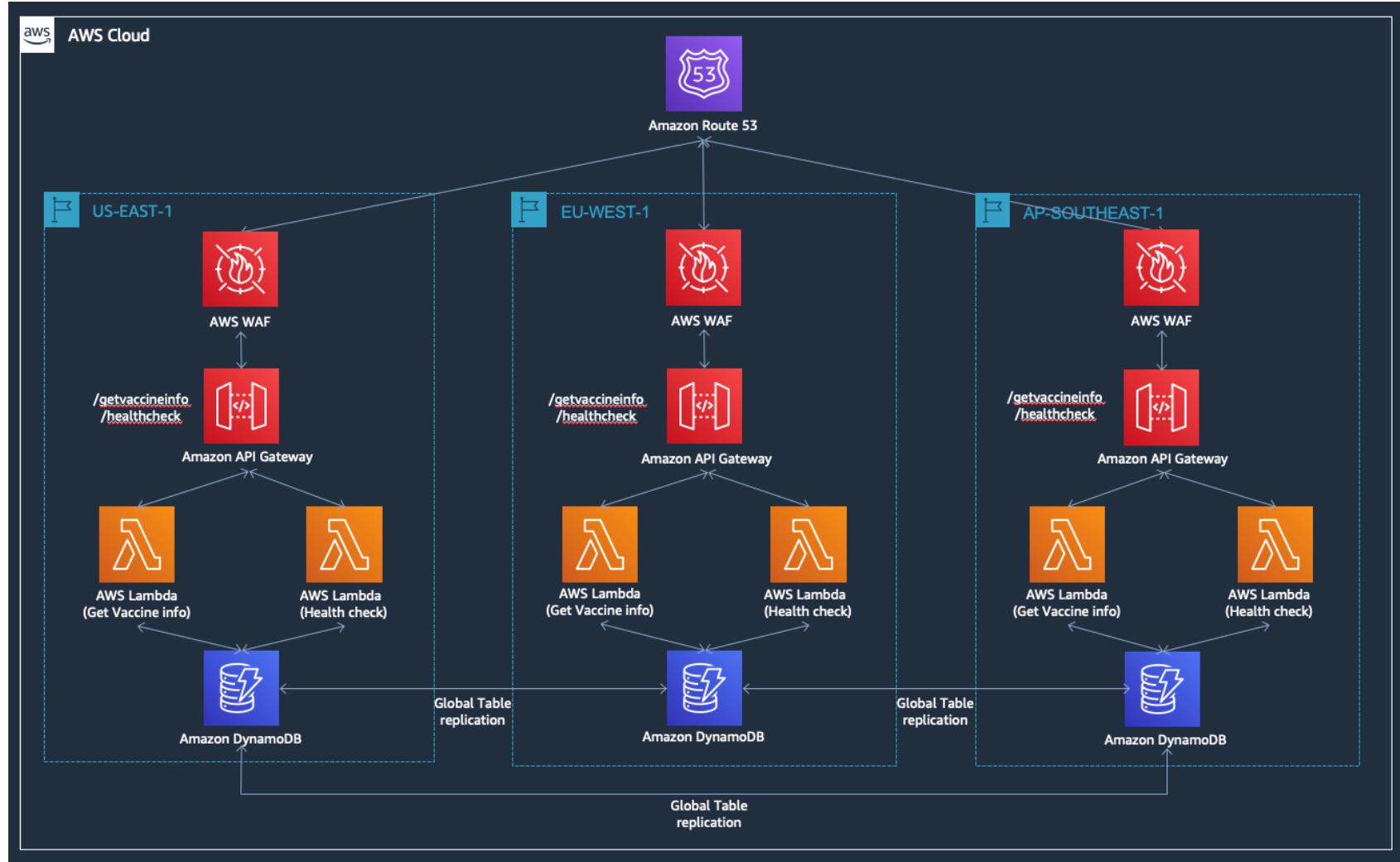
# NDHM



# CoWin

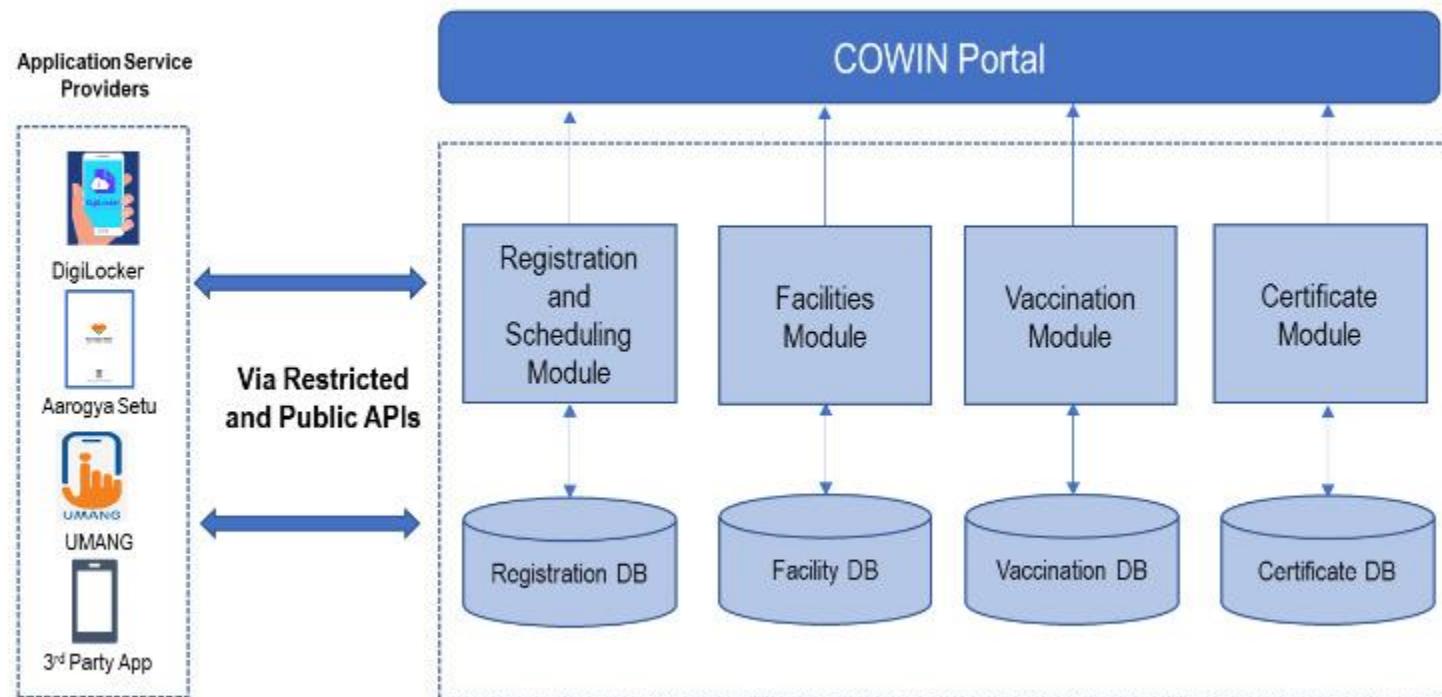


# CoWin - AWS

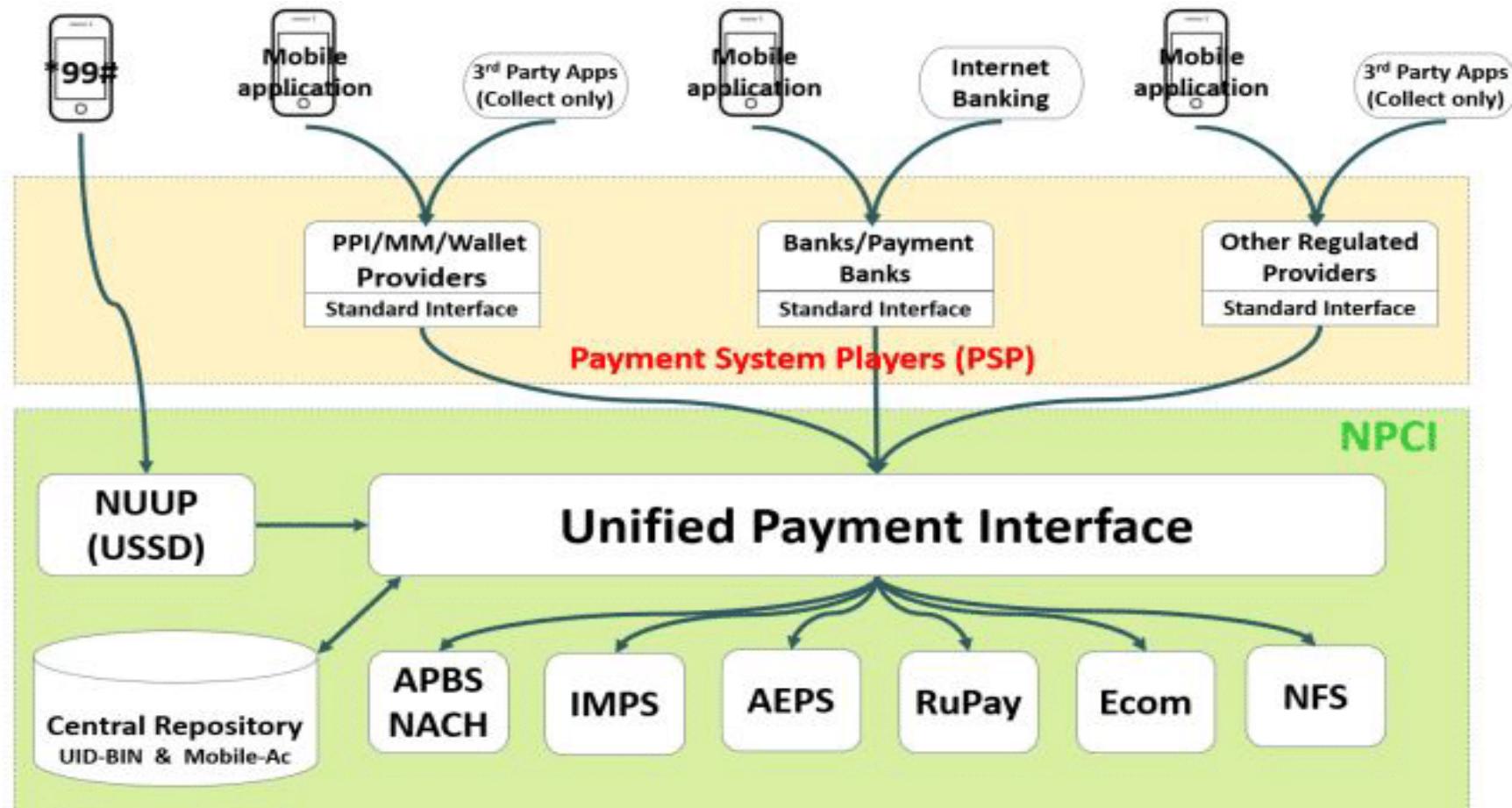


# CoWIN Platform

## CURRENT TECHNICAL ARCHITECTURE OF COWIN PLATFORM

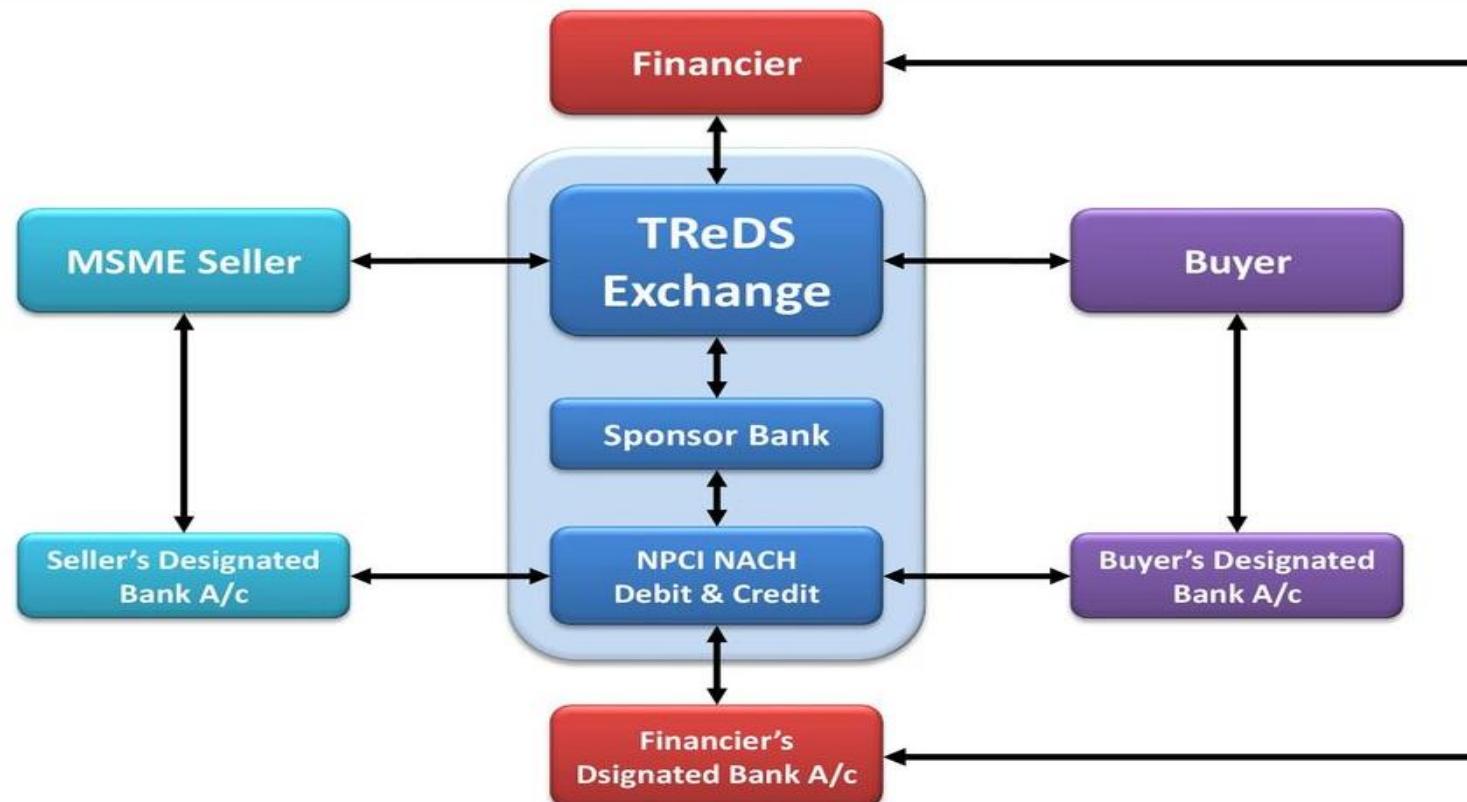


# Digital Payment - UPI



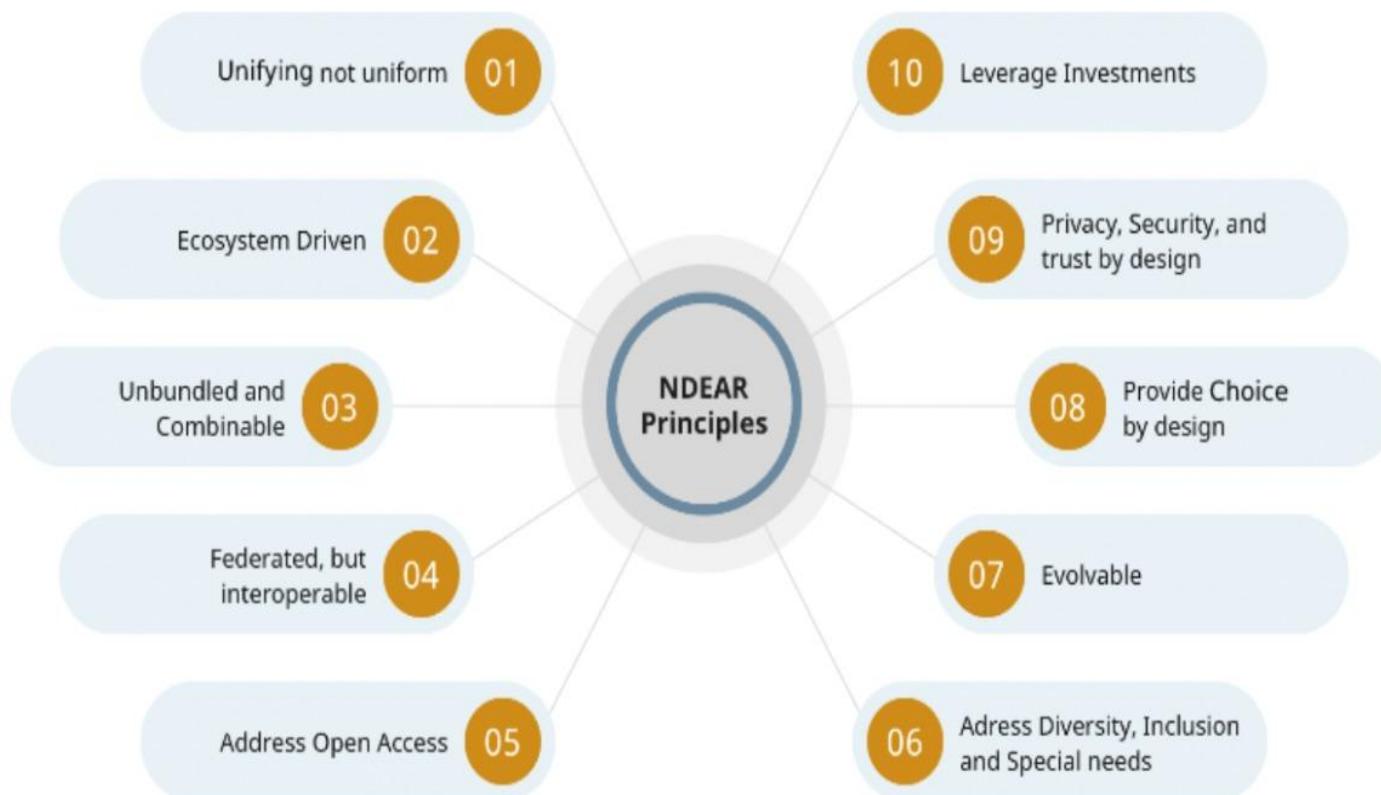
# Digital Trade - TReDS

## TReDS

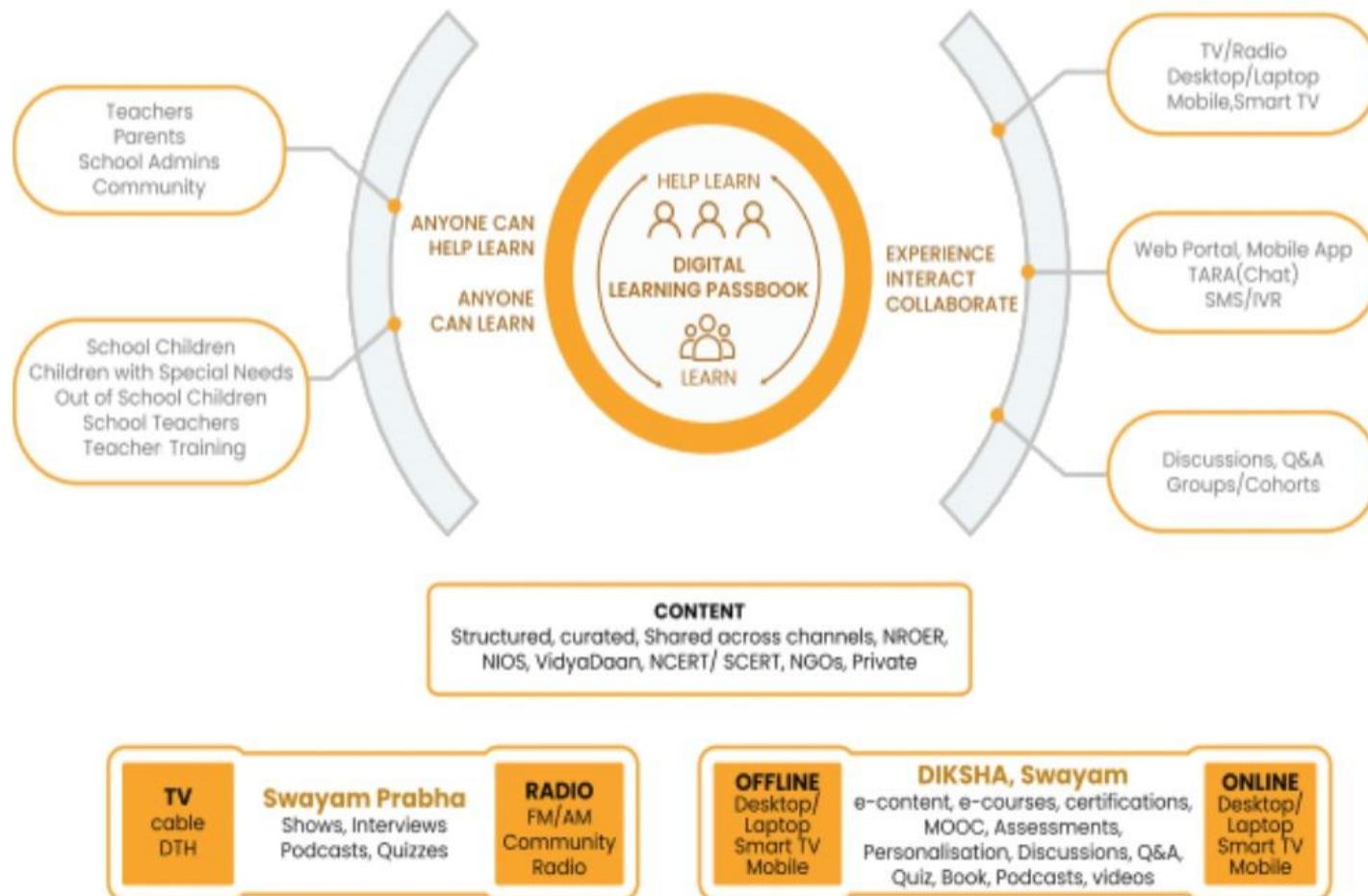


# Education

## NDEAR Architecture Principles



# Education for All



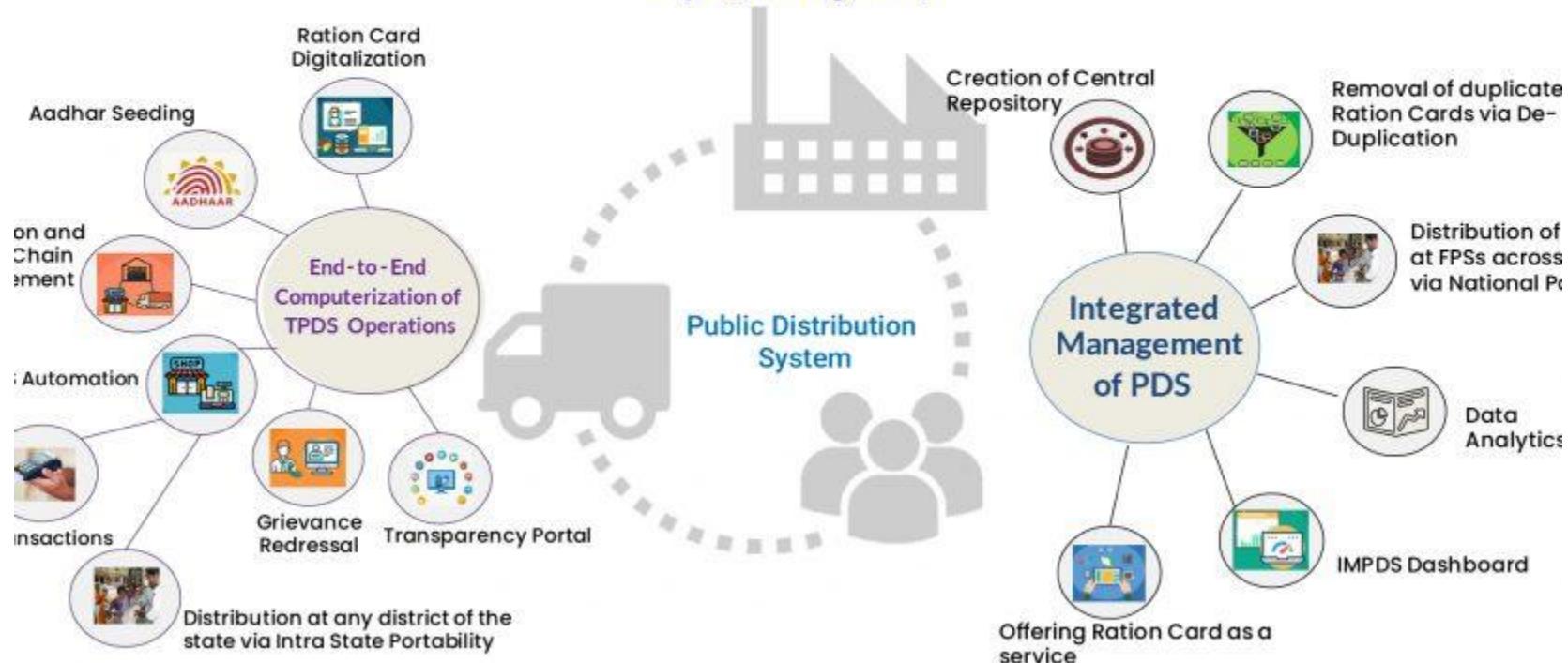
HW/SW INFRA: Smartboards, Tablets, Live Conferencing, Hosting Infra, SMS, Email, Digilocker, JAM

CONNECTIVITY: Satellite, TV, DTH, Cable, Bharat Net, WiFi, Mobile Network

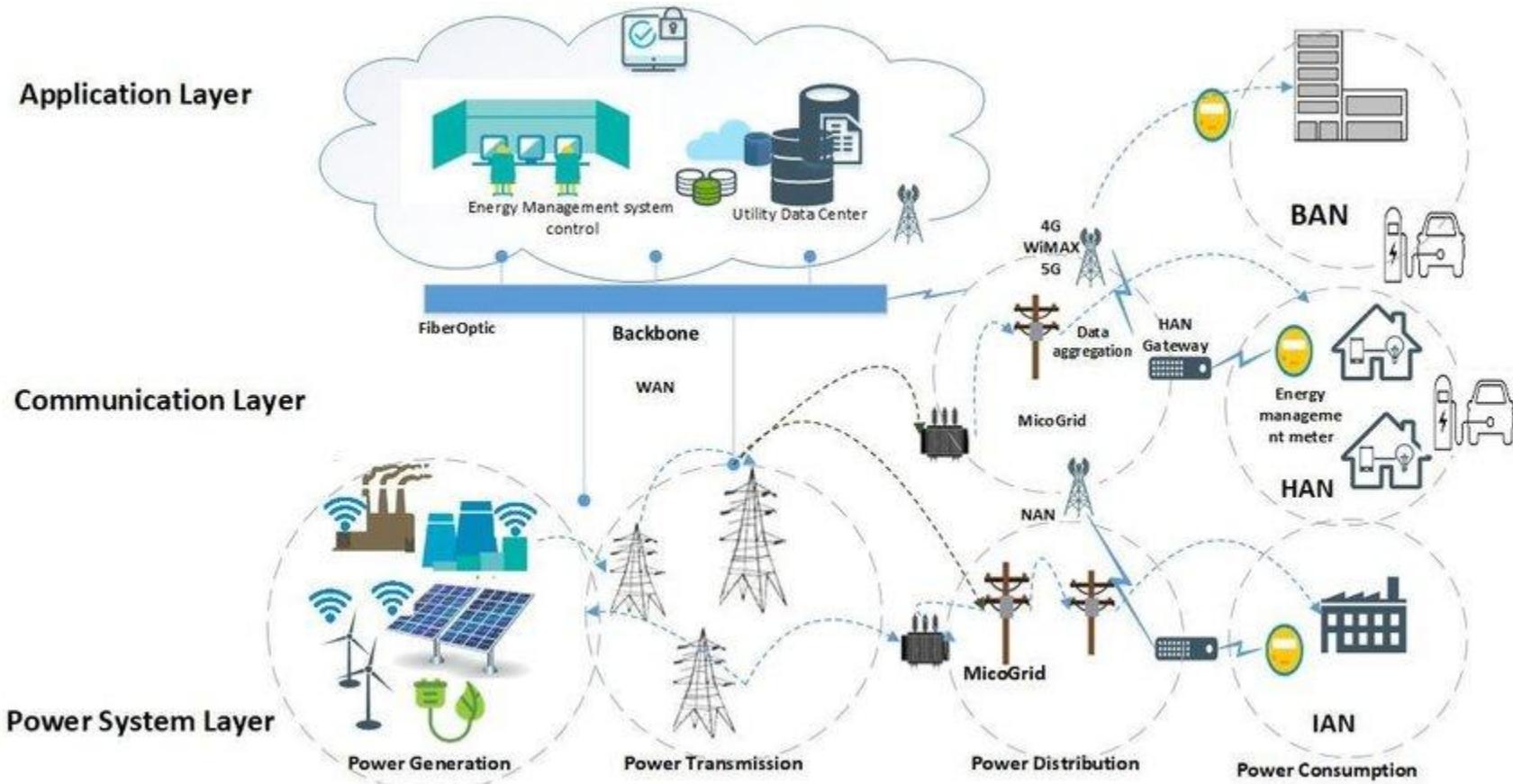
## One Nation One Ration Card

Journey from State-wise E2E Computerization

<https://nfsa.gov.in/>

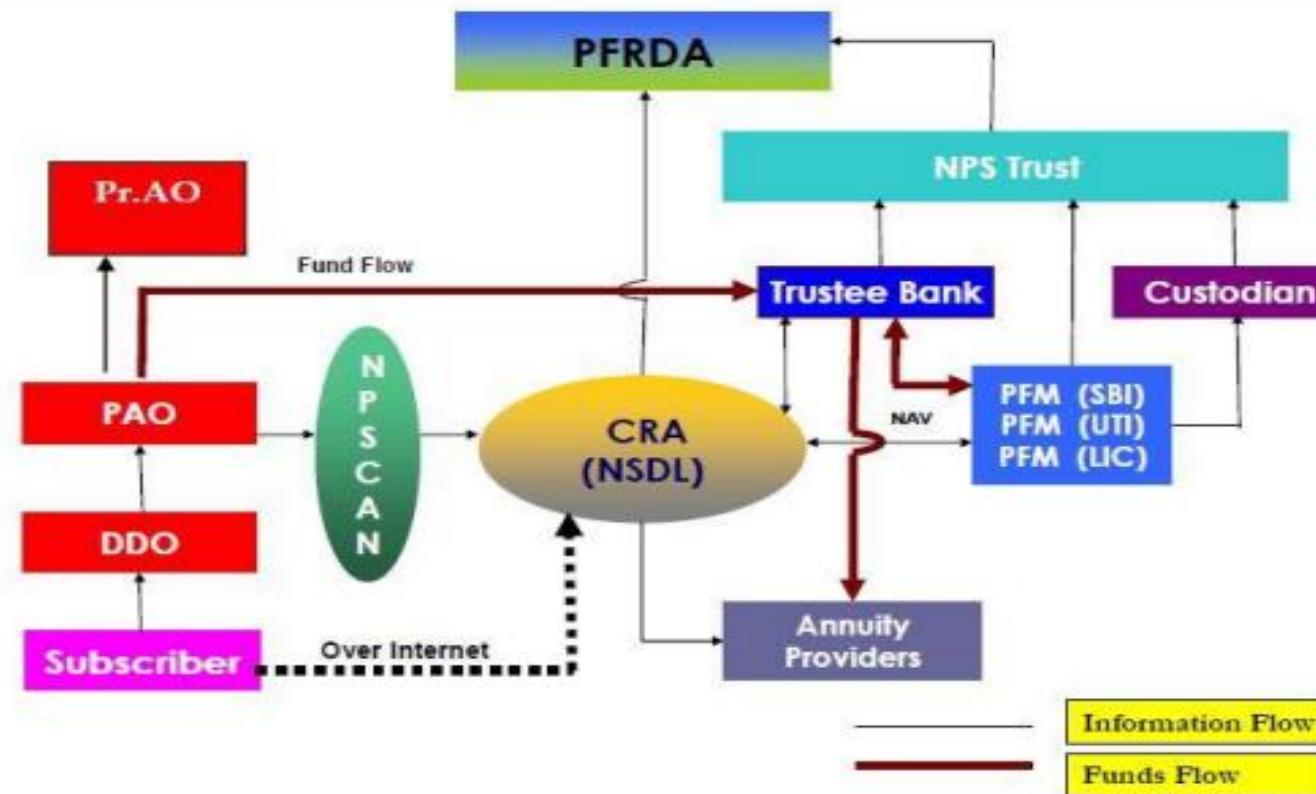


# Digital Smart Grids

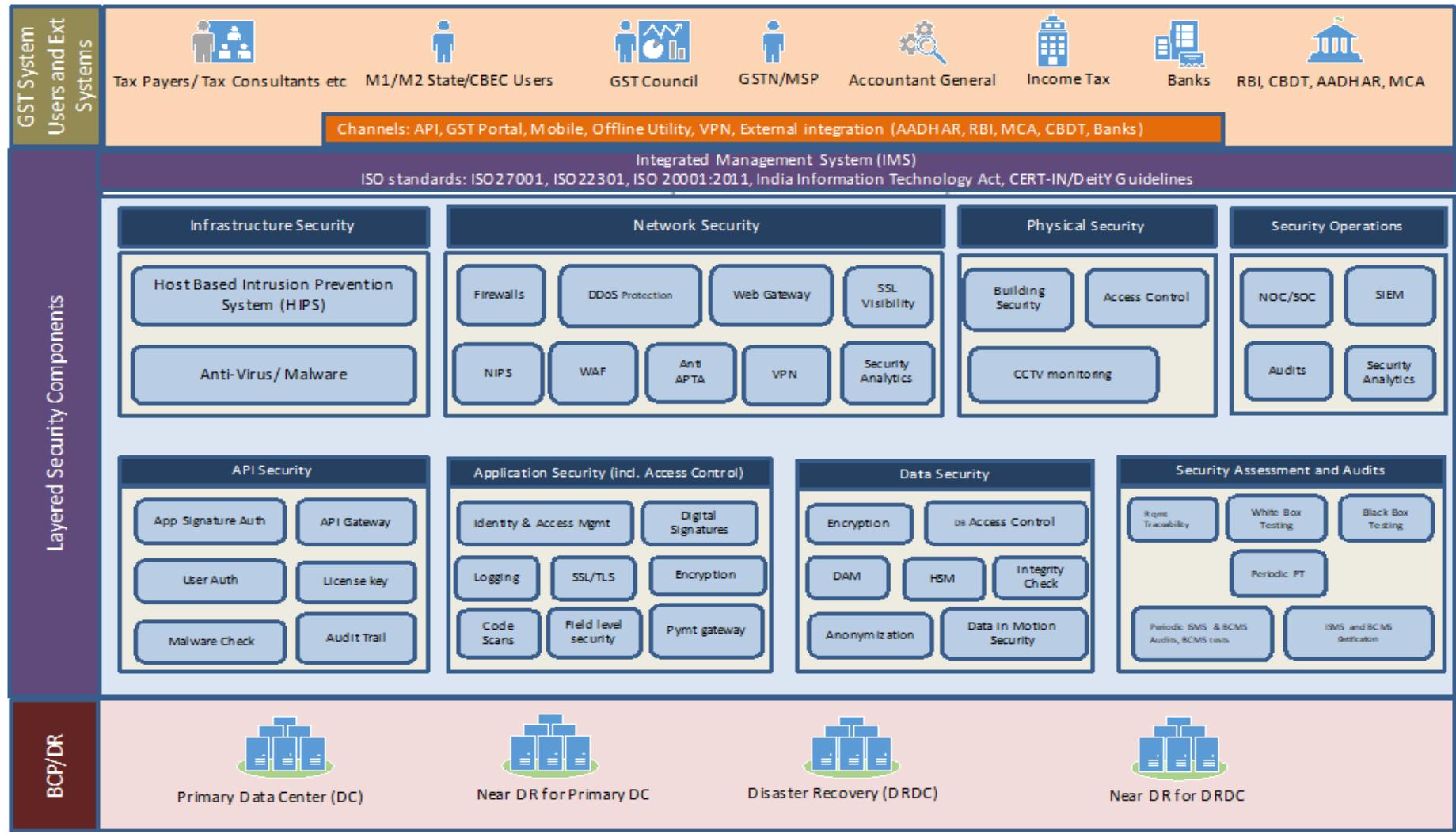


# NPS System

## NPS Architecture



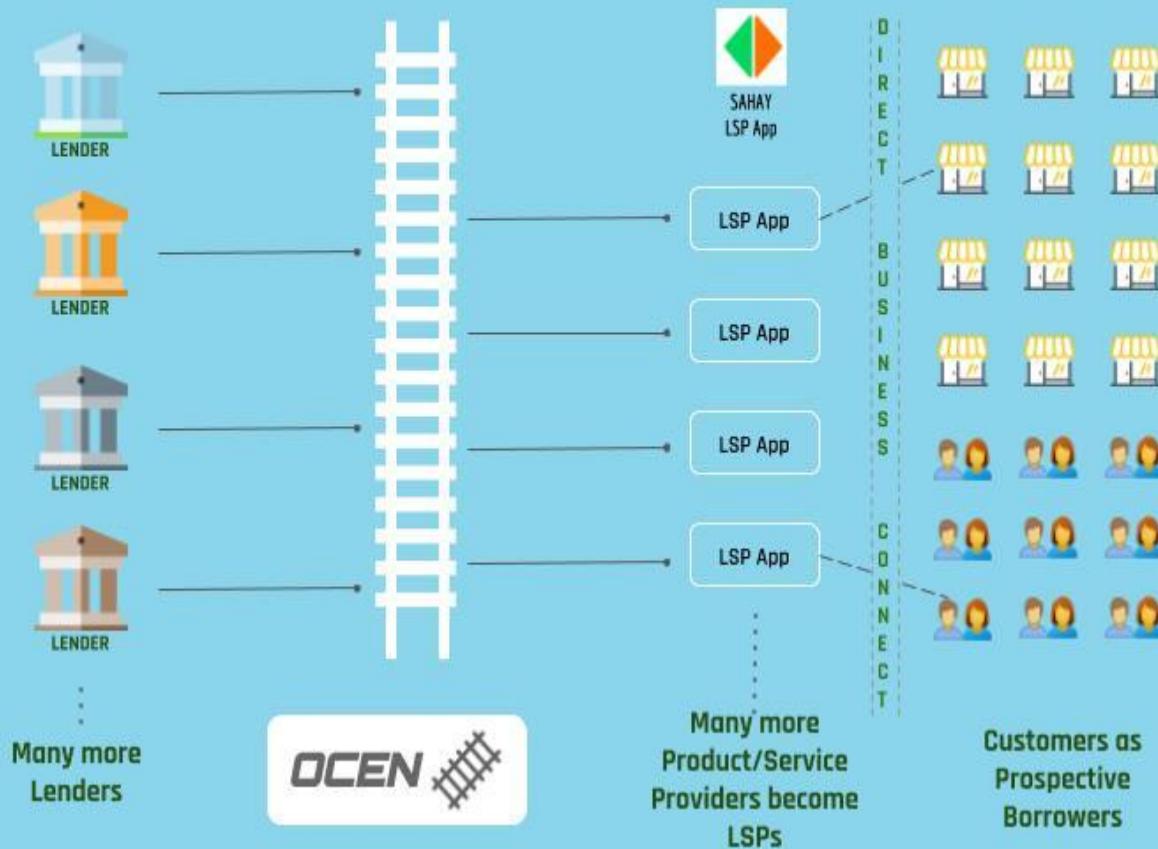
# GSTN System



# Digital - OCEN

## Open Credit Enablement Network

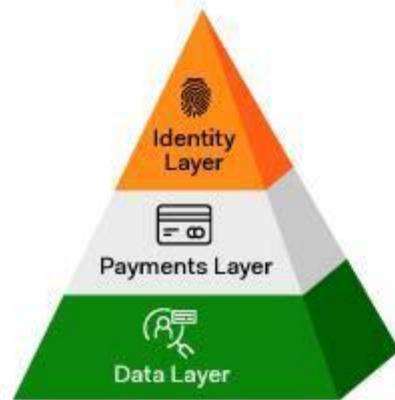
Open standards based network to accelerate access to affordable, formal credit



# India Stack Use Case

**IndiaStack is designed to power many use cases**

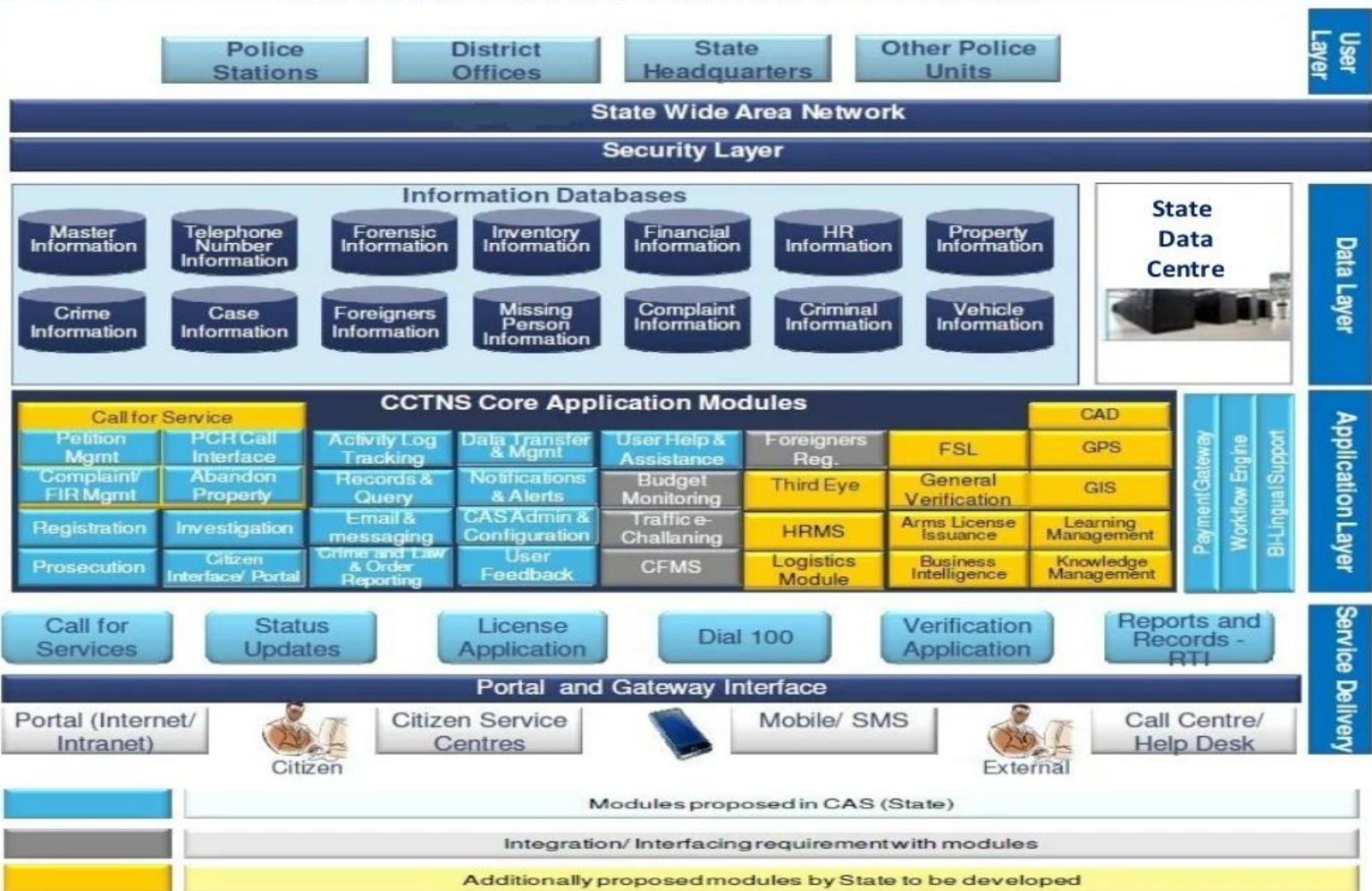
## INDIASTACK INFRASTRUCTURE



Source: iSPiRT

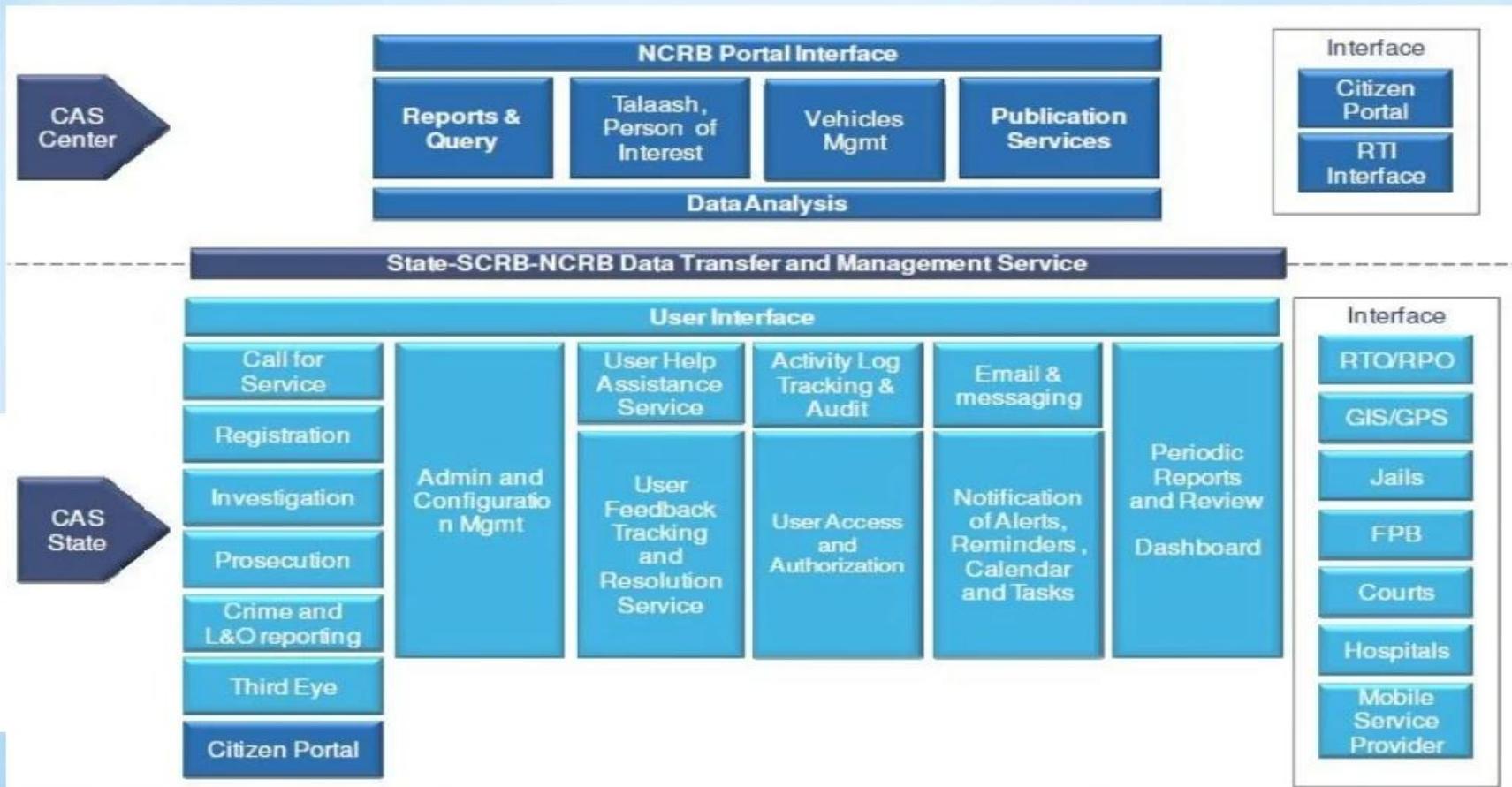
# CCTNS

## TECHNOLOGY ARCHITECTURE

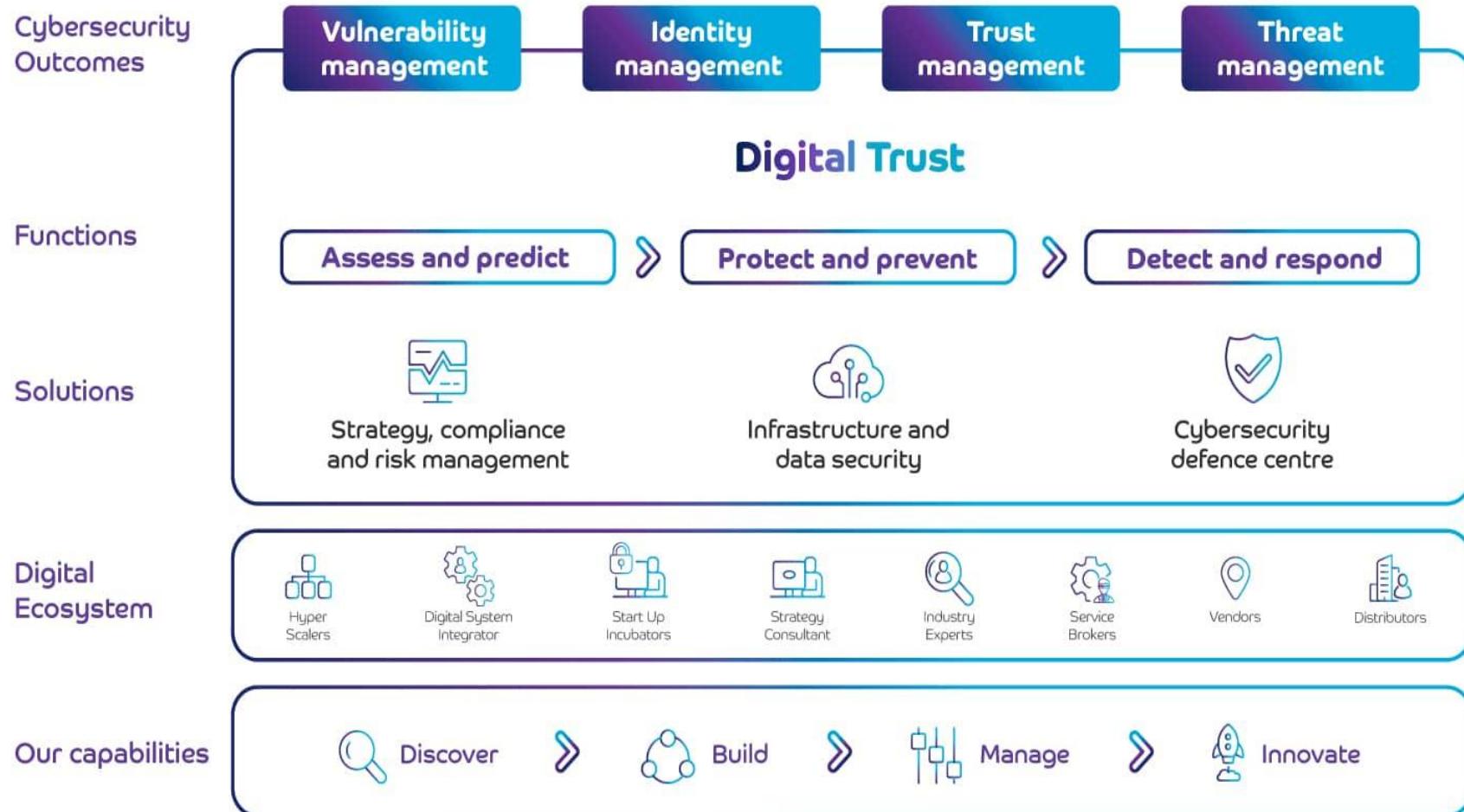


# CCTNS

## INTEGRATION AND INTERFACING REQUIREMENTS



# DPI for Economic Dev





# MES - Responsibilities

**Construction and Infrastructure Development:** MES undertakes the planning, design, and construction of various military infrastructure projects such as airfields, barracks, training facilities, storage depots, roads, bridges, and other essential structures to support military operations.

**Facility Maintenance and Repair:** MES is responsible for the ongoing maintenance, repair, and renovation of military facilities to ensure they remain operational and in optimal condition. This includes repairing damages caused by natural disasters, accidents, or wear and tear.

**Logistics Support:** MES provides logistical support to the military by managing engineering equipment, supplies, and resources necessary for construction and infrastructure projects. This includes transportation, procurement, and distribution of materials and equipment.

# MES - Responsibilities

**Environmental Engineering:** MES may also be involved in environmental engineering activities such as waste management, pollution control, and environmental remediation to mitigate the environmental impact of military operations and facilities.

**Combat Engineering:** In addition to construction and infrastructure tasks, MES personnel may be trained in combat engineering skills such as fortification, demolition, mine clearance, and bridging to support military operations in combat zones.

**Disaster Response and Humanitarian Assistance:** MES units often play a crucial role in disaster response and humanitarian assistance missions by providing engineering support for disaster relief efforts, including search and rescue operations, temporary shelter construction, and infrastructure restoration.

# MES - Responsibilities

**Technical Advisory Services:** MES personnel may provide technical advice and expertise to military commanders and government agencies on engineering matters related to infrastructure development, construction projects, and environmental management.

The Military Engineering Service plays a vital role in supporting the operational readiness and effectiveness of the armed forces by ensuring they have the necessary infrastructure and engineering capabilities to carry out their missions effectively, both in peacetime and during conflicts or emergencies.

DPI implementation within MES can improve efficiency, effectiveness, and transparency in various aspects of military engineering operations.

# DPI in MES

**Digital Design and Planning:** MES can utilize advanced digital tools and software for architectural design, engineering planning, and project management. Computer-aided design (CAD) software, Building Information Modeling (BIM), and Geographic Information Systems (GIS) can facilitate the creation of detailed plans for military infrastructure projects, enhancing accuracy and efficiency in the design phase.

**Integrated Project Management Systems:** Implementing digital project management systems allows MES to streamline project scheduling, resource allocation, and progress tracking. Cloud-based project management platforms enable real-time collaboration among team members, contractors, and stakeholders, improving communication and coordination in construction projects.

**Asset Management and Maintenance:** DPI solutions can be used for asset management and maintenance of military infrastructure facilities. Utilizing digital asset management systems, MES can track the condition, maintenance history, and lifecycle of assets such as buildings, roads, and utilities, enabling proactive maintenance and optimizing asset utilization.

# DPI in MES

**Remote Monitoring and Surveillance:** MES can deploy digital sensors, cameras, and monitoring systems to remotely monitor critical infrastructure assets and detect potential issues or security threats. Remote surveillance technologies enhance situational awareness and security, allowing MES to respond promptly to incidents and vulnerabilities.

**Geospatial Intelligence (GEOINT):** Leveraging geospatial intelligence capabilities, MES can analyze terrain data, satellite imagery, and geographical information to inform decision-making in infrastructure planning, route optimization, and site selection for military installations and operations.

**Cybersecurity and Information Assurance:** Given the sensitive nature of military engineering operations, DPI implementation includes robust cybersecurity measures to safeguard digital infrastructure, data, and communication networks against cyber threats. Secure network architecture, encryption protocols, and intrusion detection systems are essential components of MES's cybersecurity framework.

# DPI in MES

**Digital Training and Skills Development:** MES personnel can undergo training programs focused on digital tools, technologies, and best practices relevant to military engineering operations. Digital training modules, simulations, and virtual reality environments enhance the proficiency and readiness of MES personnel in utilizing DPI solutions effectively.

Integrating Digital Public Infrastructure into the Military Engineering Service enhances its capabilities in planning, executing, and maintaining military infrastructure projects, ultimately contributing to the readiness and effectiveness of the armed forces.

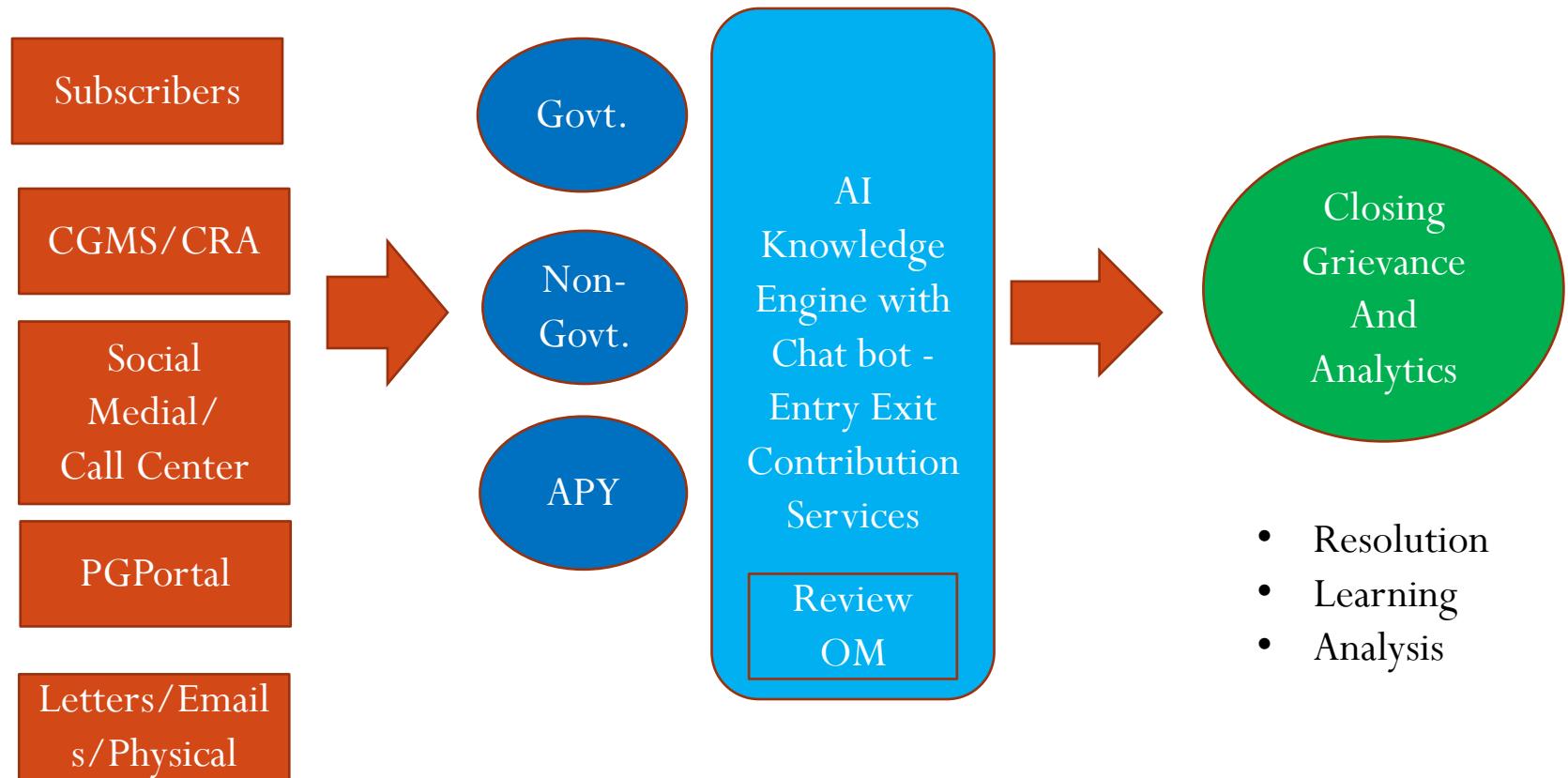
# Thank you

[Srinivas.bhoosarapu@gmail.com](mailto:Srinivas.bhoosarapu@gmail.com)

9154035731

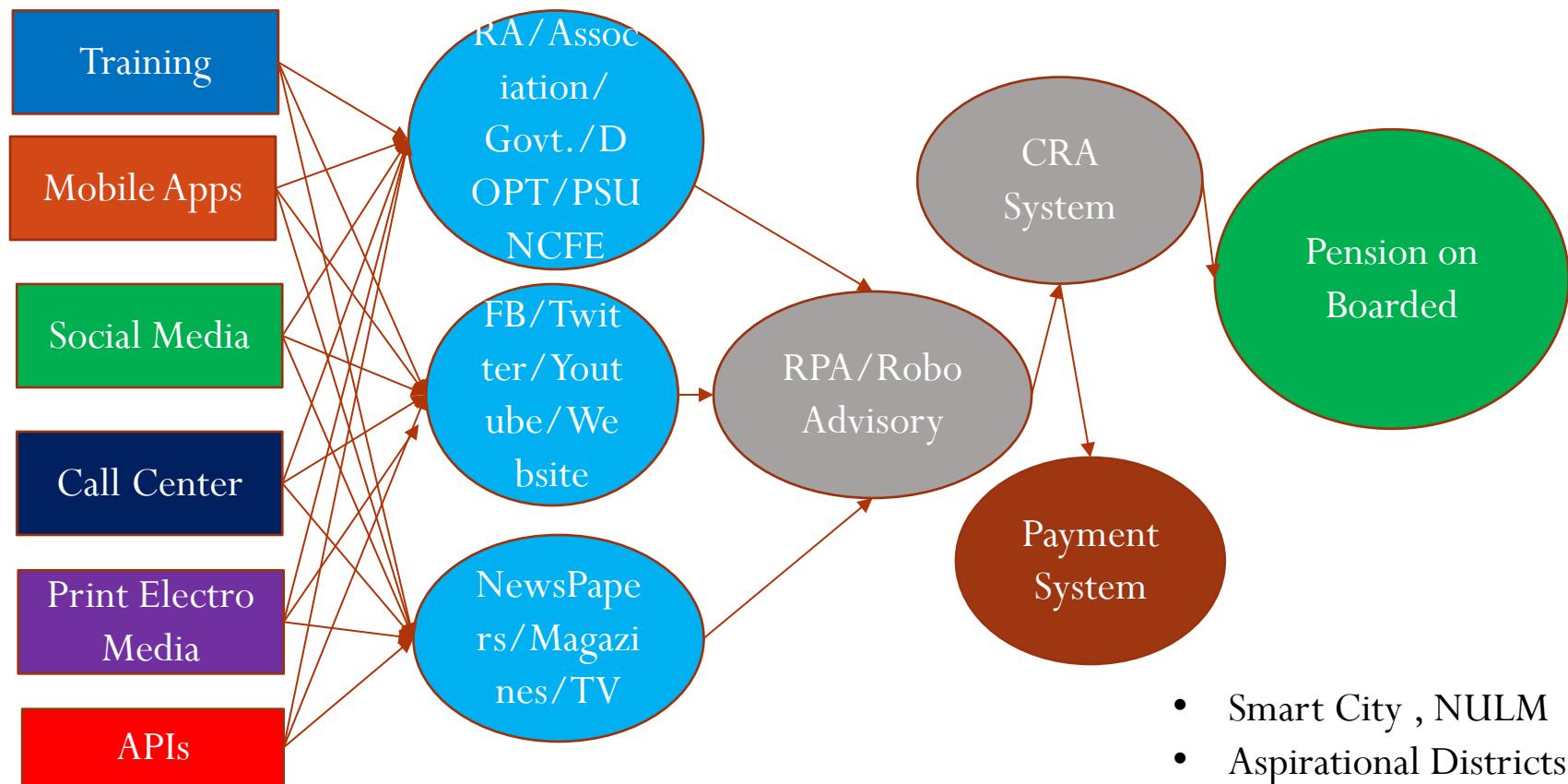
# NPS-AIPGRM -Digital Transform

## AI based Integrated Pension Grievance Redressal Management (ML/DL)



# NPS- RIOBS

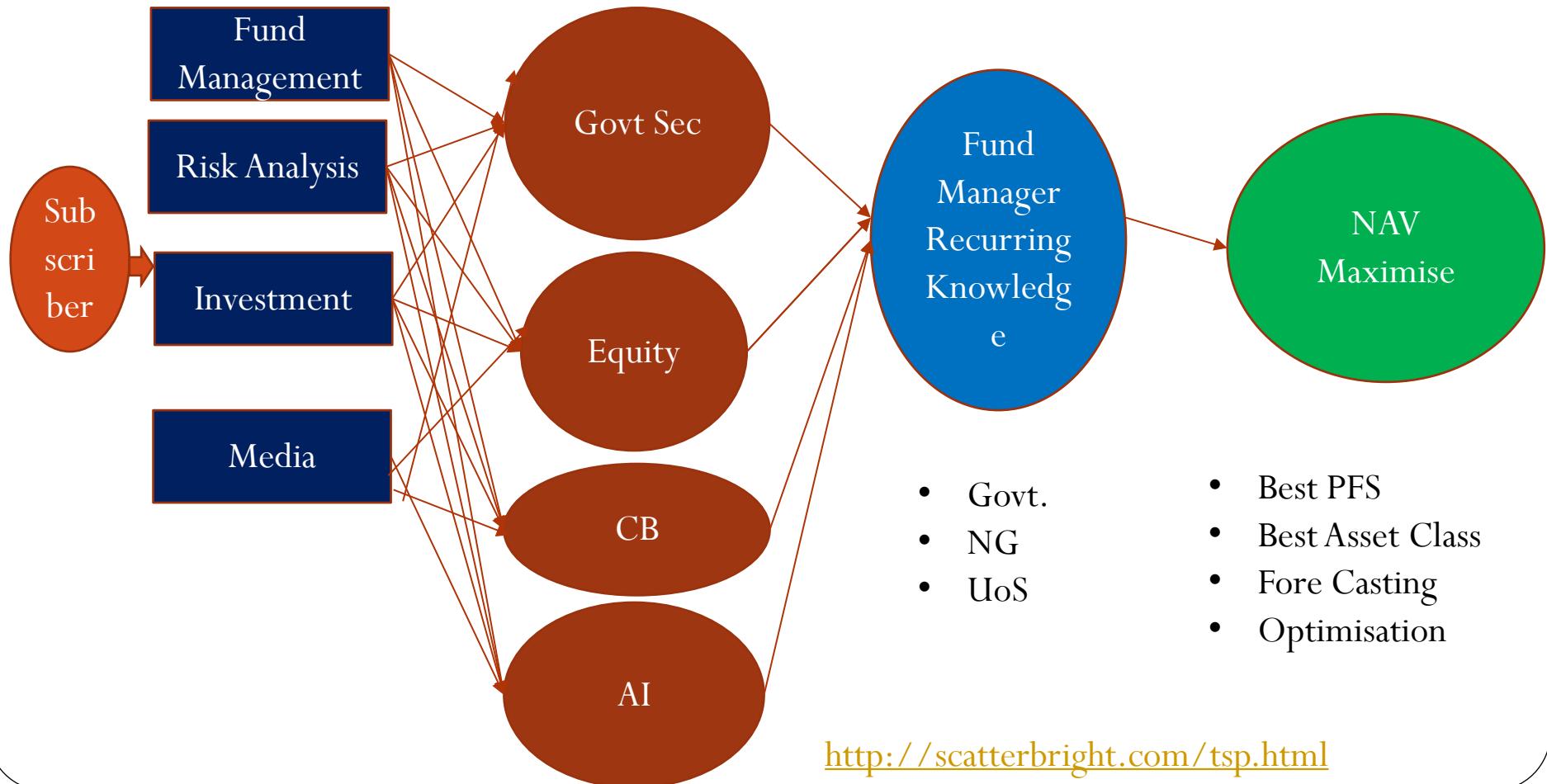
## Digital Transformation - Retirement Innovative On Boarding System (DL/ML)



- Smart City , NULM
- Aspirational Districts
- NIRD

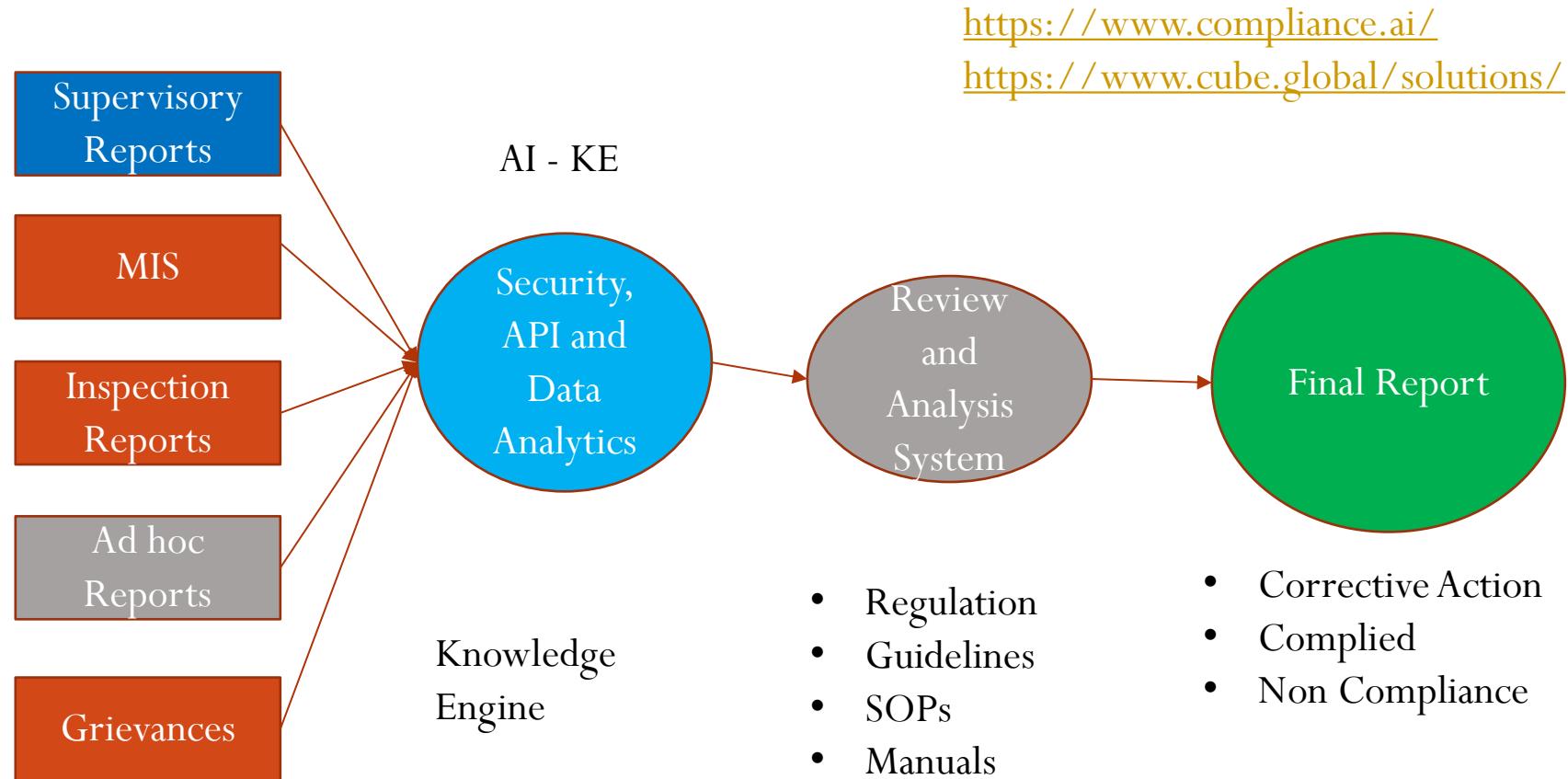
# NPS- AI based NAV Prediction

## Digital Transformation - Investment and NAV Prediction (ML/DL)



# NPS- SupTech/RegTech Transform

## Digital Transformation - Reg Compliance Improvement System (ML/DL)

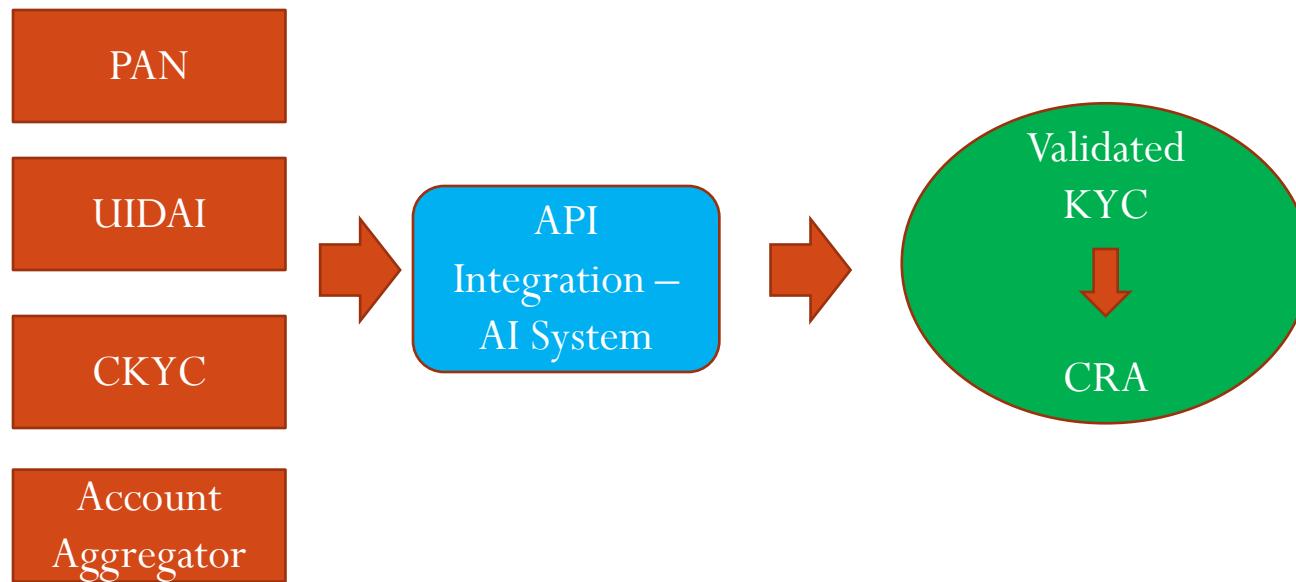


# NPS – State Govt.

## Digital Transformation - eKYC (ML/DL)

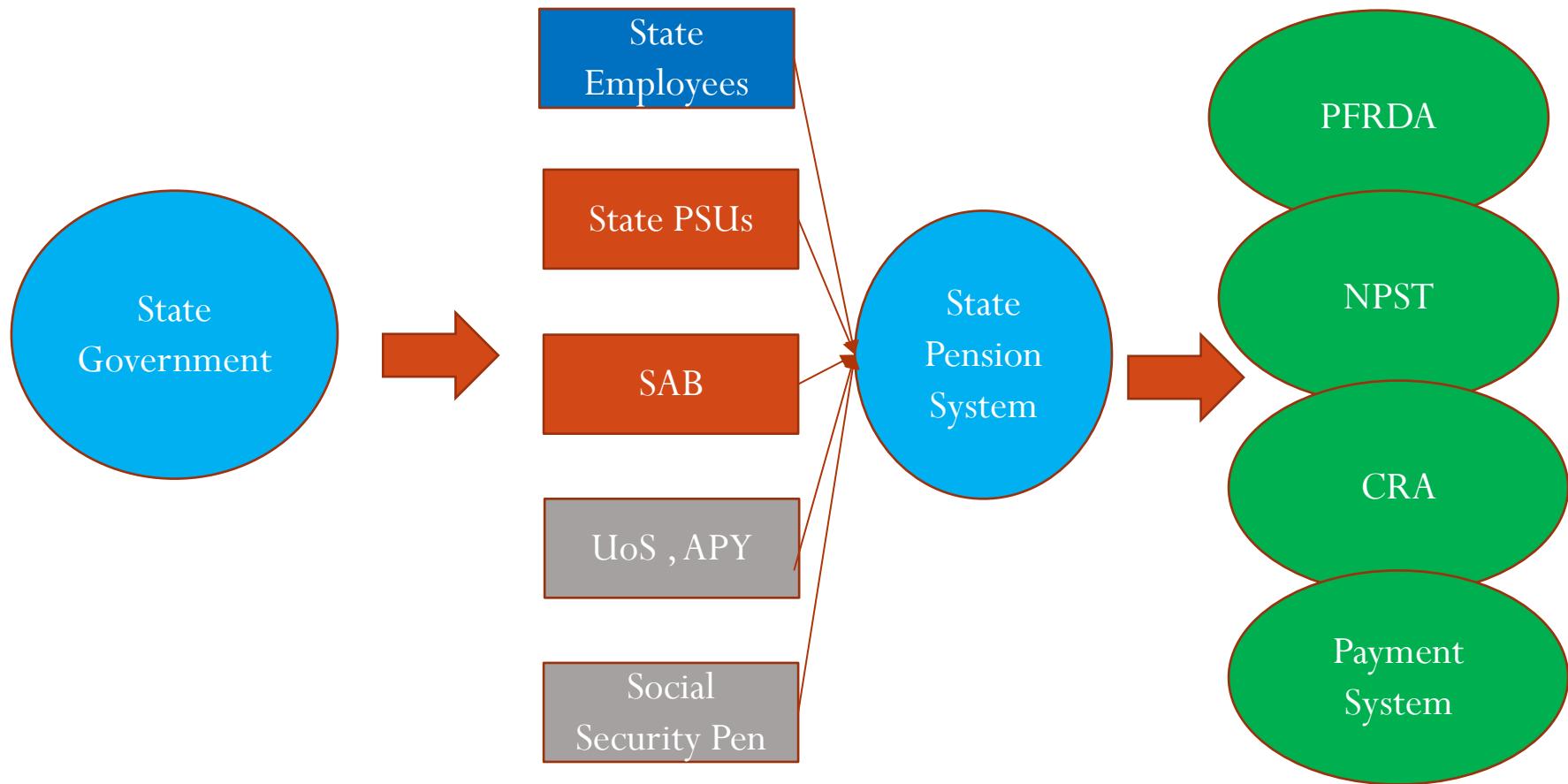
Out of 776 rejected forms, 577 forms were rejected due to following reasons which consist of Top 5 Rejections:

- 301 Rejection Pertaining to Incorrect form submission (Not opted for PRAN generation through FC)
- 88 Rejection pertaining to CERSAI details not provided
- 76 Forms rejected due to "Duplicate form submitted". For example: PAN/Passport etc.
- 70 Rejection pertaining to Bank Supporting Documents not provided
- 42 Rejection pertaining to mobile number not provided/invalid



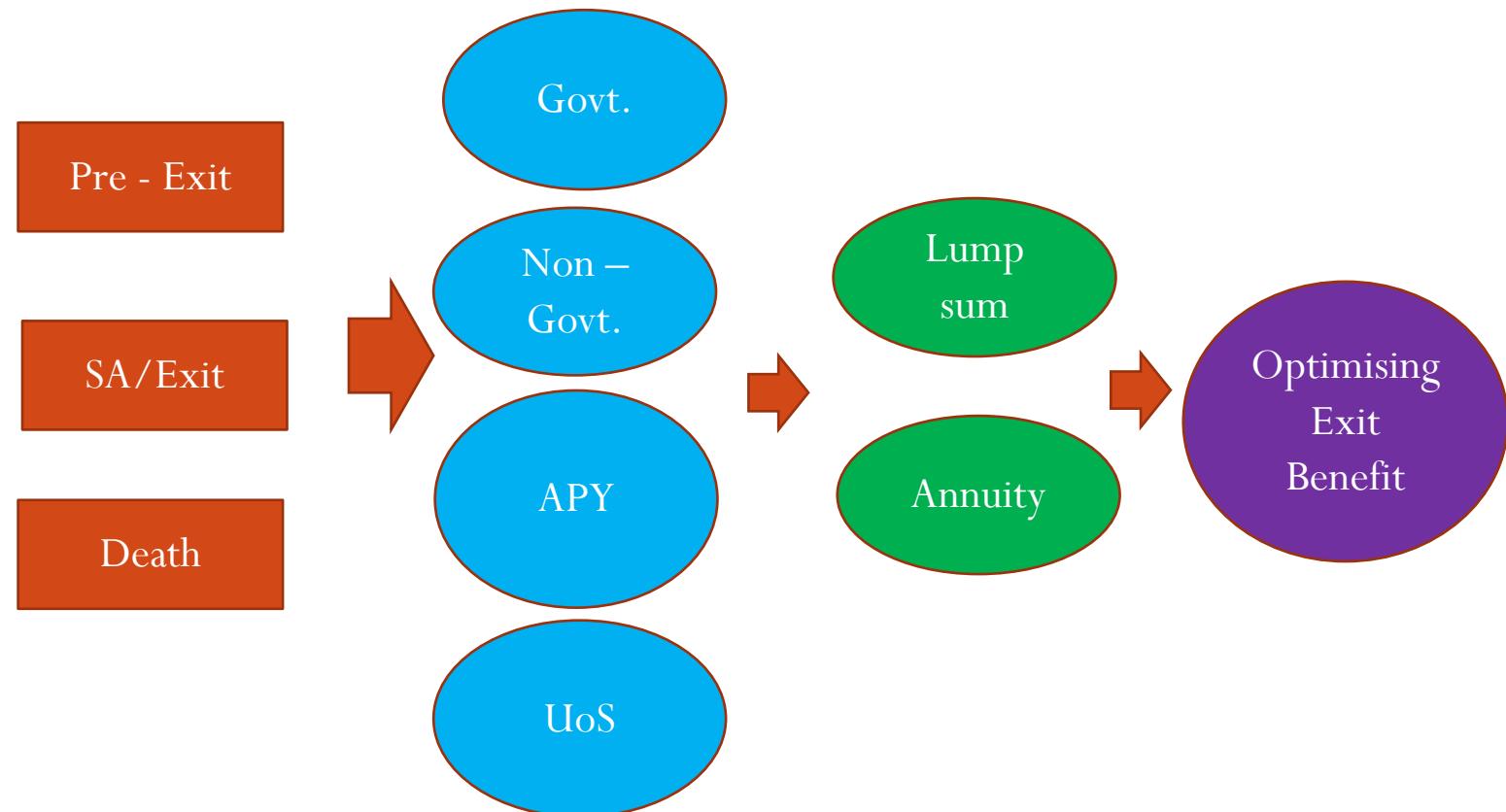
# NPS – SPS

## Digital Transformation - State Government Pension (ML/DL)



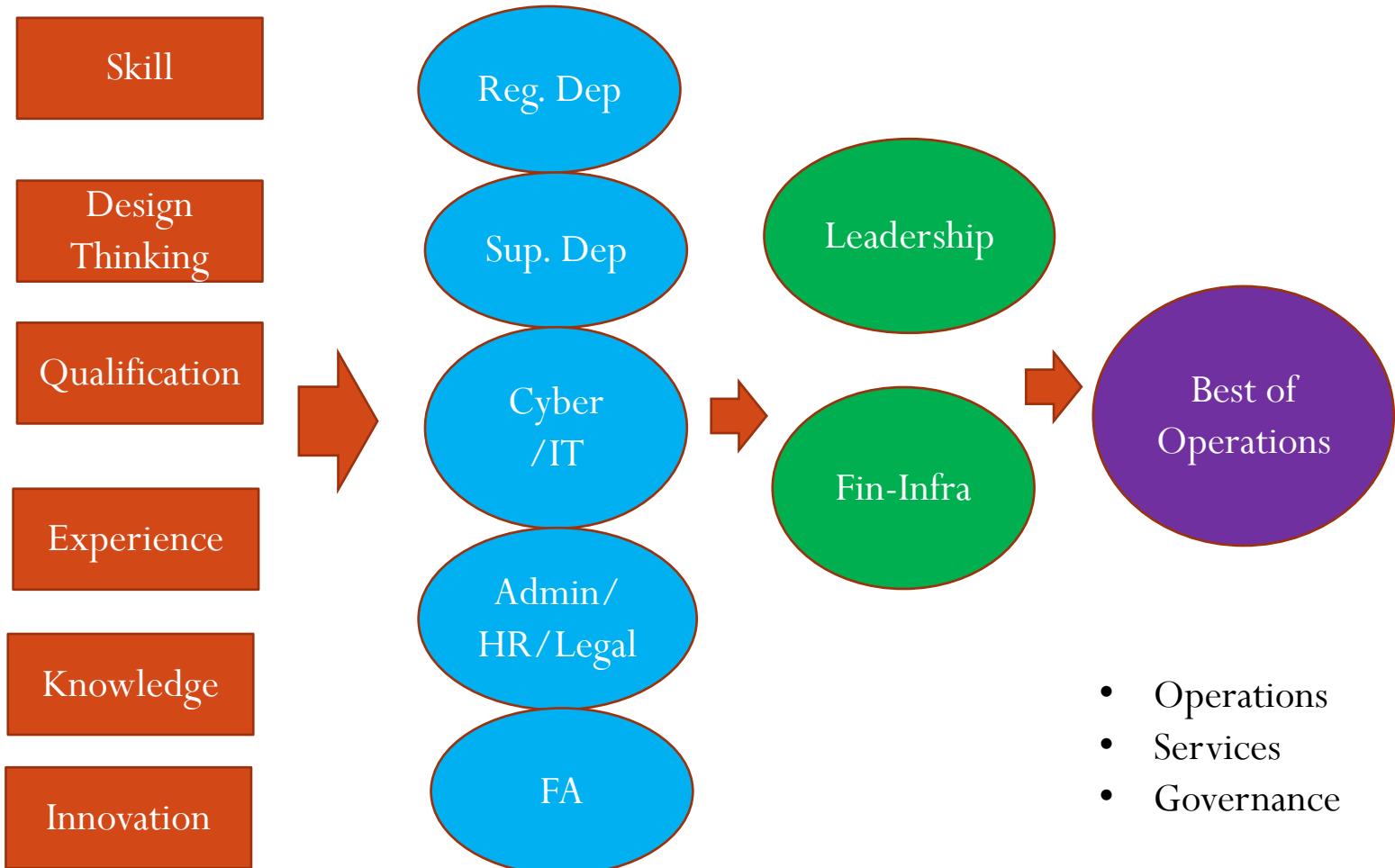
# NPS – Exit/Withdrawal

## Digital Transformation - Exit/Withdrawal Use case (ML/DL)



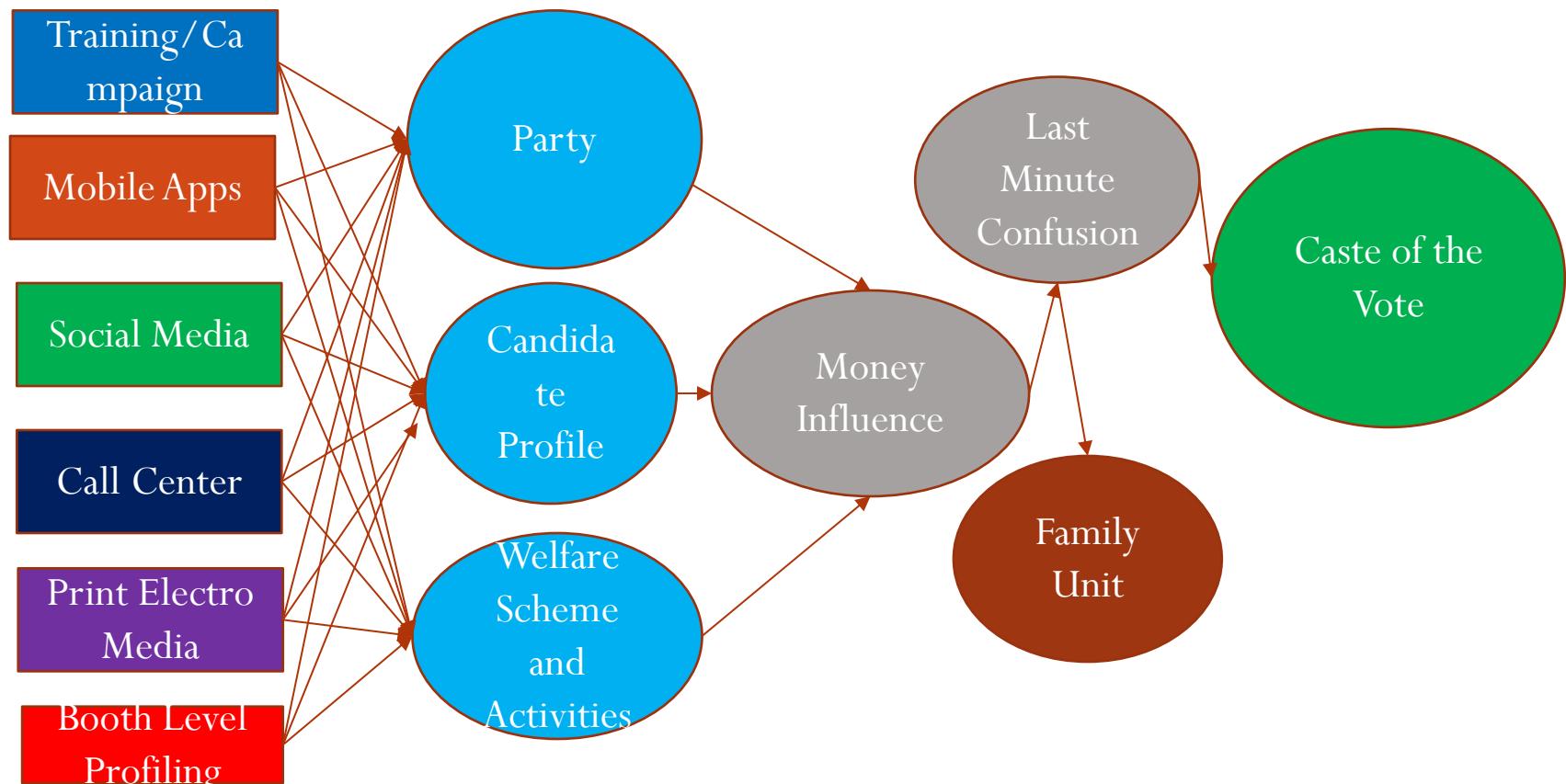
# PFRDA – Internal Transformation

## Digital Transformation Internal Transformation

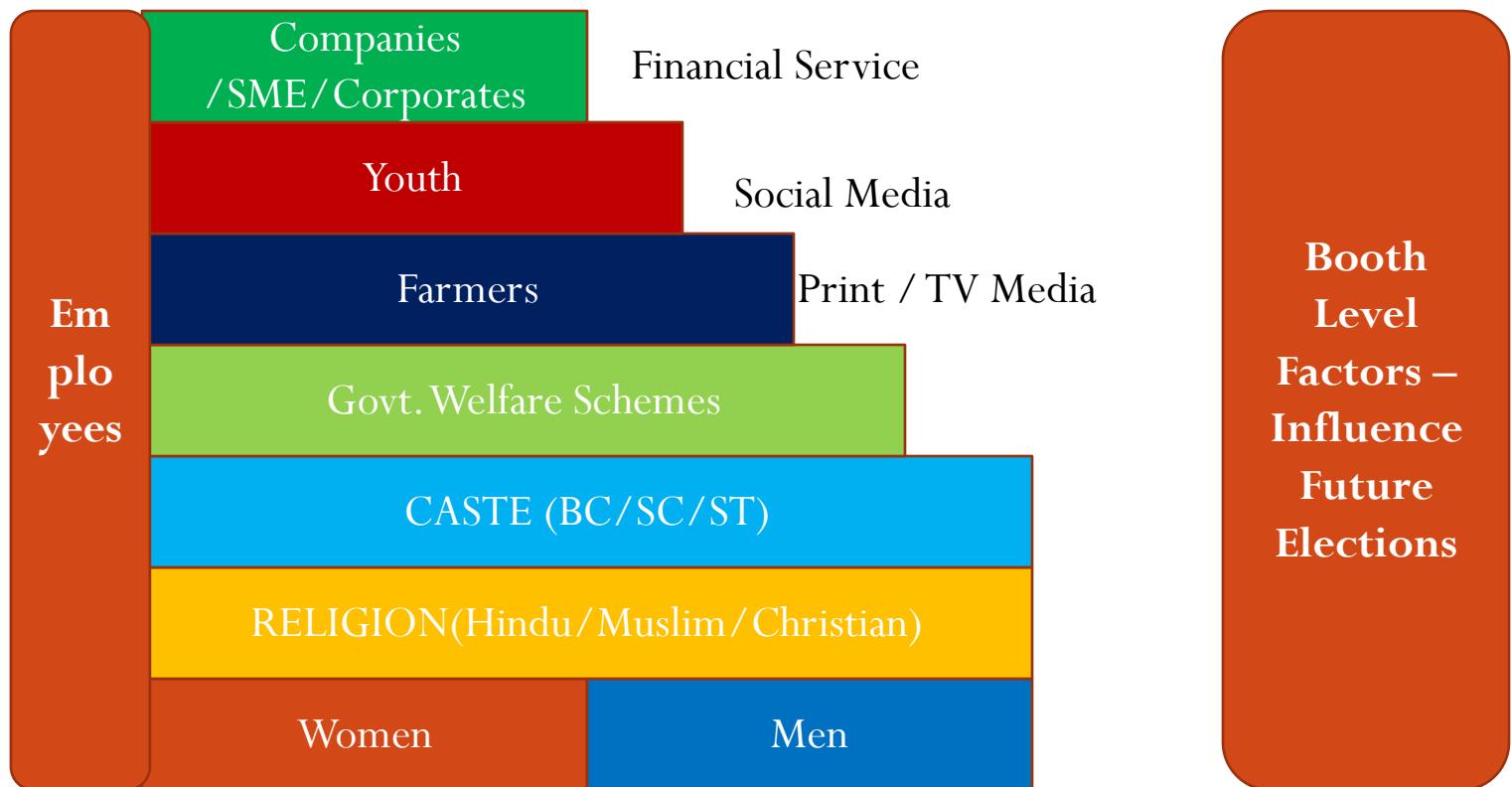


# Voter Social Sentiment Engineering

## Digital Transformation - Voting Social Engineering



# Booth Level Voting for Future



Thank you