National Digital Education Architecture **NDEAR**

Introduction and Ideas

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What is NDEAR

The National Digital Education Architecture comes with a vision to create a 'Unifying national digital infrastructure to energise and catalyse the education ecosystem'.

NDEAR Guiding Principle

- **Para 24.4 (b) of NEP 2020:** The core idea of NDEAR is to facilitate achieving the goals laid down by National Education Policy 2020, through a digital infrastructure for innovations in the education ecosystem, ensuring autonomy and participation of all the relevant stakeholders.

- It will pave the way to achieve learning outcomes by offering solutions to learners and teachers.

- Digital ecosystem of Education needs to take a long-term view of aspects like interoperability, data governance, data quality, data standards, security and privacy, besides promoting open innovation

NDEAR is	NDEAR is not
1. An **architectural blueprint** for the education ecosystem and not a system.	1. A monolith platform; or
2. That **defines** a set of	2. Portal; or
a. Principles – e.g. technology and ecosystem	3. Application; or
b. Standards and Specifications – e.g. technology and data	4. A mobile app; or
c. Guidelines – e.g. data proces, ecosystem engagement	5. An entity; or
d. Policies – e.g. data, openness, inclusion, accessibility	6. Software component(s); or
3. And **identifies the key building blocks** needed to make the architecture blueprint a reality	7. Prescriptive set of:
4. For an **ecosystem** of	a. Features Solutions
a. **Actors** to build, develop, innovate – interoperable building blocks	b. Education policies+programmes It is not a builder or developer of building blocks, solutions, programmes
b. **Applications/Innovations** in the form of Solutions, platforms, tools, assets to be developed and used	
5. To enable the **achievement of policy goals** through programmes such as – SSA, FLN Mission – etc	

Major Challenges faced by Indian Education Sector

17 crore out of 52 crore estimated population in age group 3 to 23 years is out of formal education system

Digital Divide

Challenges in Foundational Learning and Numeracy

Learning Outcomes, Assessment

Large no of School drop out (approx. 85 lakhs in a year)

Teacher Education, Teacher Management

Quality of education

Education Governance

Digital & Emerging Technologies can make a difference

Source:UDISE, Shagun

NDEAR Guiding principles

Federated Architecture
(Decentralised)

Privacy & security by design

Inclusivity

Interoperable - Seamless portability

Ecosystem Approach
(Engagement of all stakeholders)

Longitudinal Records
(records documented over time – life-long)

Learn, Help Learn and Manage Learn

BENEFITS of NDEAR

CITIZENS	STATES	EDU-TECH ENTREPRENEURS
High quality e-content at nominal prices (Rs. 500 to Rs 1000 per annum) - PAL	Adoption of open source and open standards -	Sandbox arrangement for innovation (A sandbox is an isolated testing environment that enables users to run programs or execute files without affecting the application, system or platform on which they run)
Learning Passbook	Prevent re-invention of the wheel	Access to a much larger audience
School Migration	Sharing / Learning of best practices from other states	Have the ability to offer basic solutions on a 'free' mode
Linkage between schooling – skilling – Higher Education	Data Analytics to provide information for better policy making	Offer value added ones on payment mode
Academic Bank of Credit	Training and capacity building pathways for teachers	Creation of repository with vernacular resources as envisioned by NEP 2020- a business opportunity with social purpose
Credit for successful online courses, for vocational courses	Profiling and mapping trajectory of gifted and talented student population	
21st Century Skills	Equalizer infra created for inclusive education	

Envisaged outcomes of NDEAR

The **Students** get access to on demand learning materials, videos, graphics and animations, virtual lab and different forms of assessment tools. Access to personalized adaptive learning (PAL). Transition to higher education and skilling to be tracked.

The **teachers** get access to online support for lesson plans, use of TLM, pedagogic transactions, online reference materials, competency based evaluation tools etc. They also get access to online modules for improving professional standards.

Schools/school management get access to school management practices, school related ERPs, learning management systems, data analytics etc.
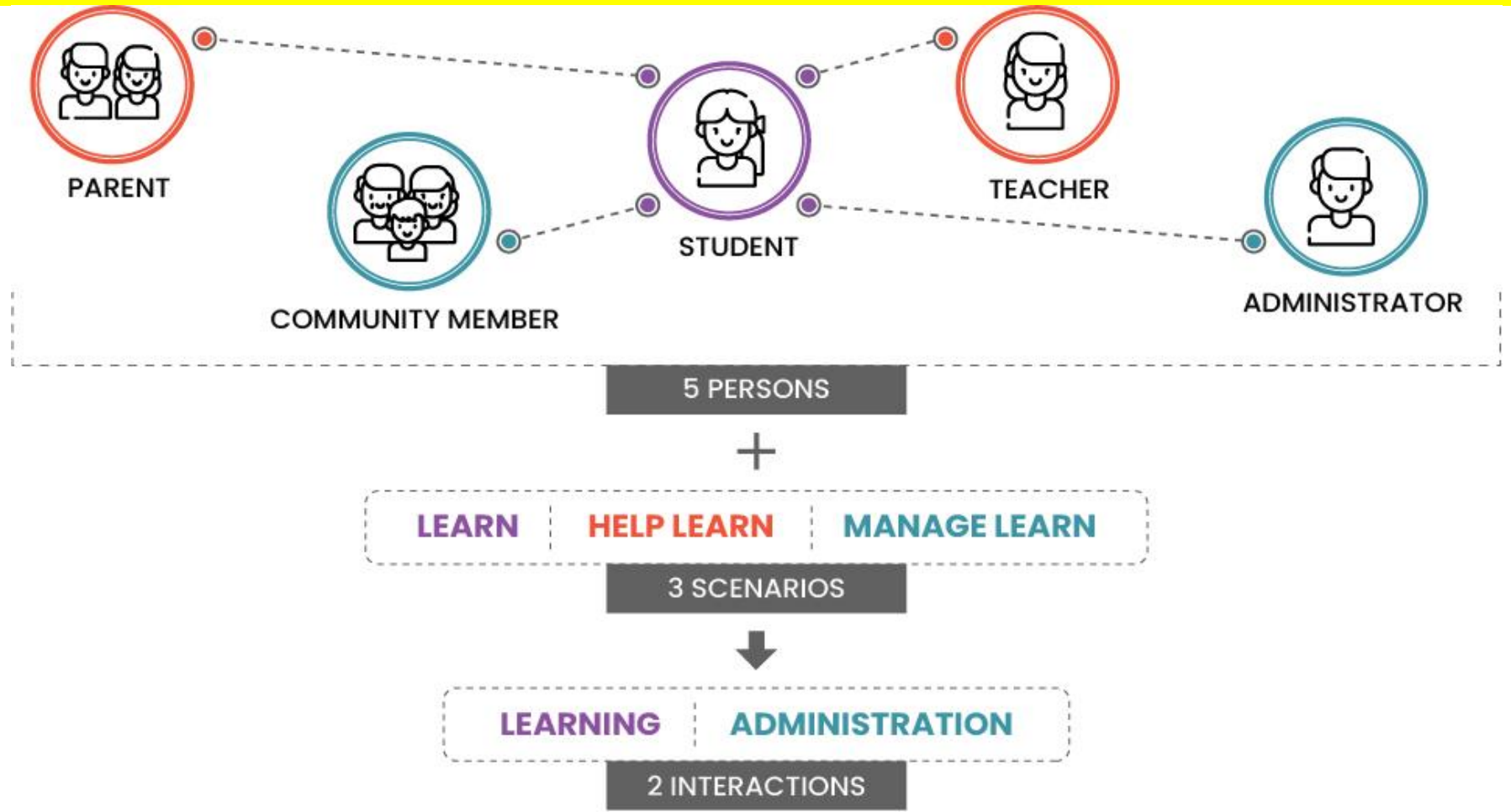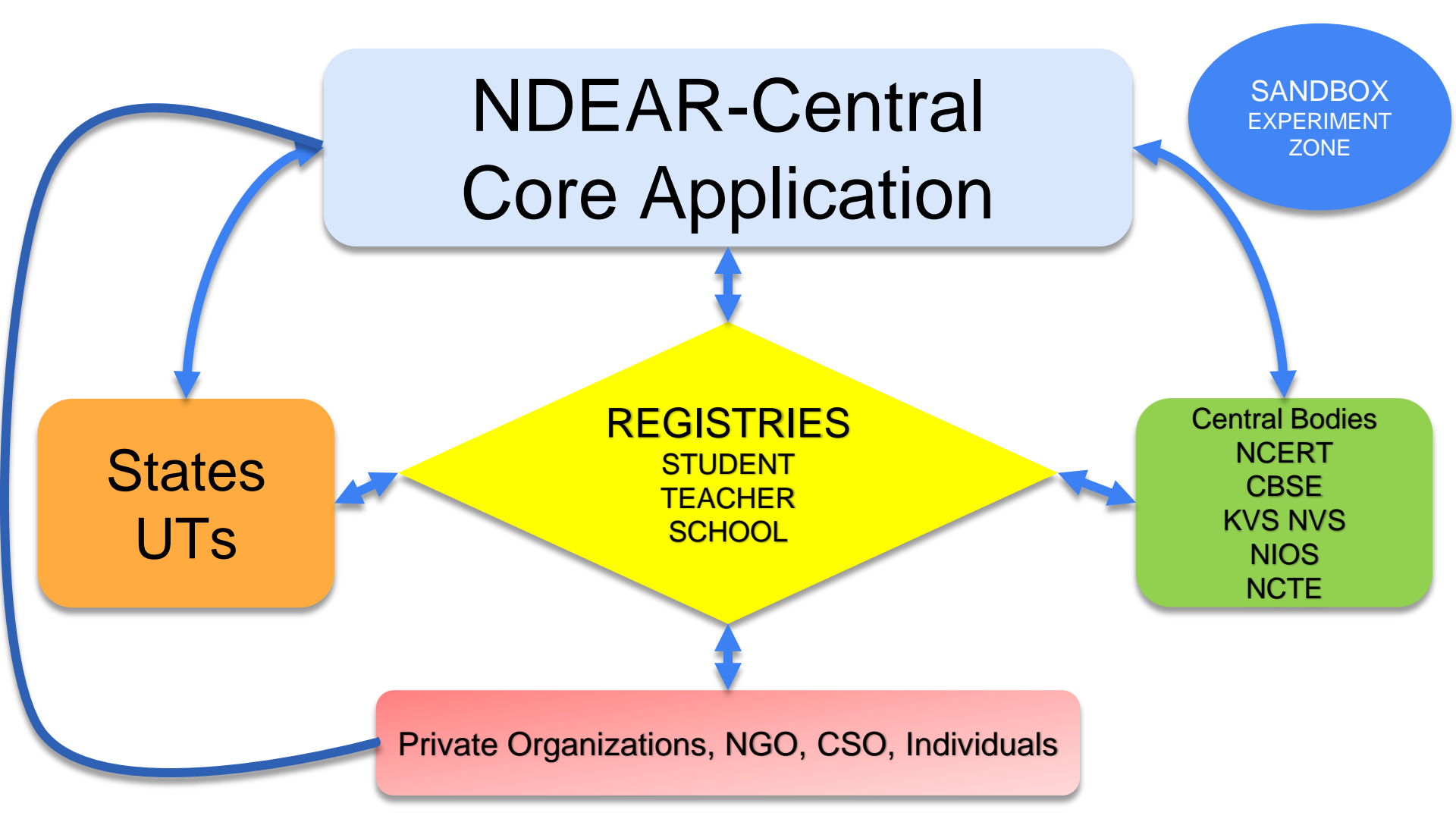
Parents get access to the child's holistic progress report, schools performance and teachers performance. **Community** place a role in voluntary engagement, CSR, mentorship etc.

Educational administrators use data analytics to bridge infrastructure gap, teacher availability gap, address dropouts and make informed policy choices.
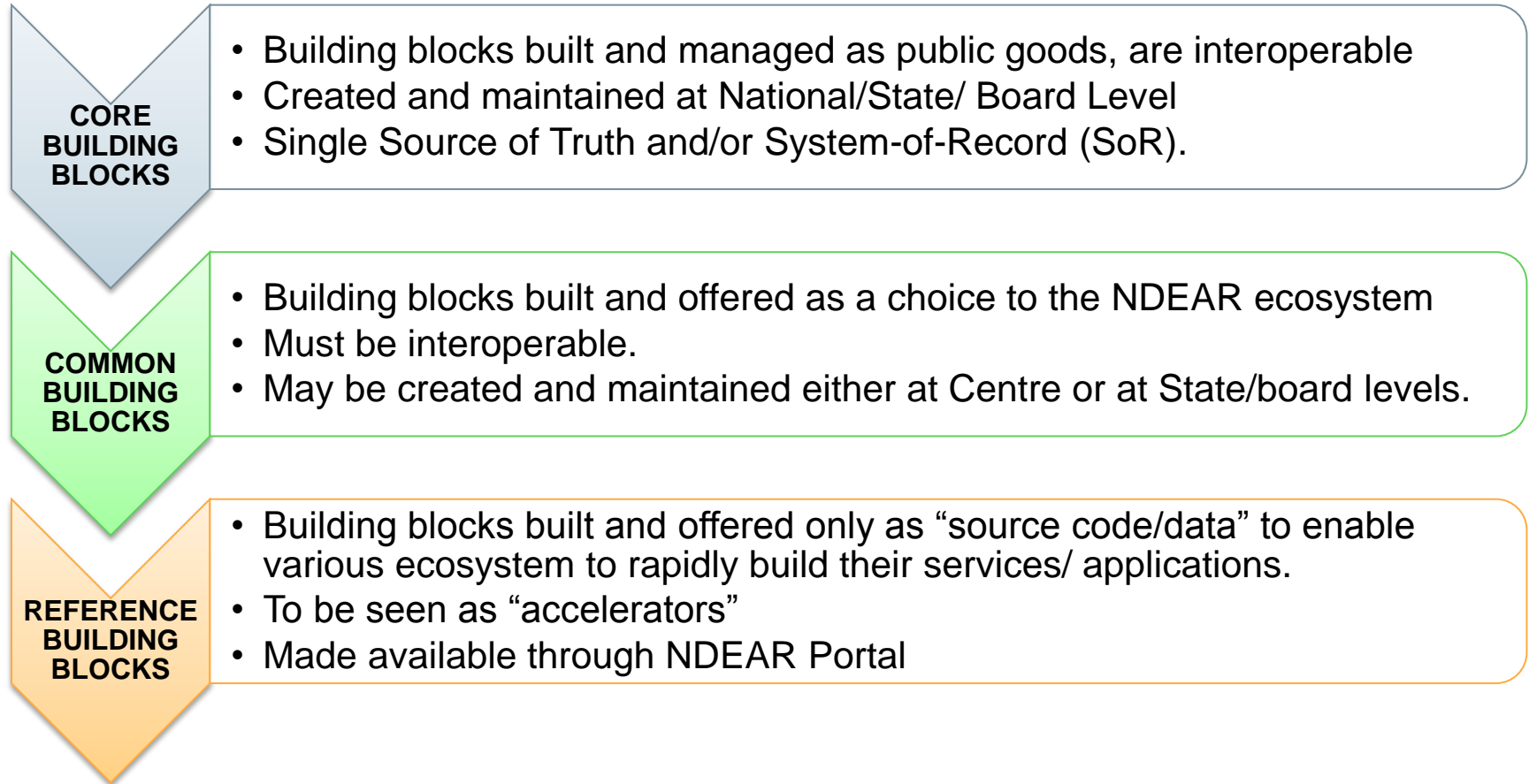
NDEAR caters to...

CORE APPLICATIONS

- DIKSHA- STANDARD LEARNING PLATFORM
- DIKSHA PAL- PERSONALISED ADAPTIVE LEARNING (Learning Outcome based)
- DIKSHA-Virtual School
- TEACHER EDUCATION VERSION 2.0
- ASSESSMENT (Proctored examination tests)
- SCHOOL GOVERNANCE, ADMINISTRATION MODULES
- AFFILIATION, SCHOOL BOARD MANAGEMENT etc.

This is built for all requirements of KVS, NVS, CBSE, NIOS, NCTE which will serve as example for country and States will be motivated to adapt and adopt the applications
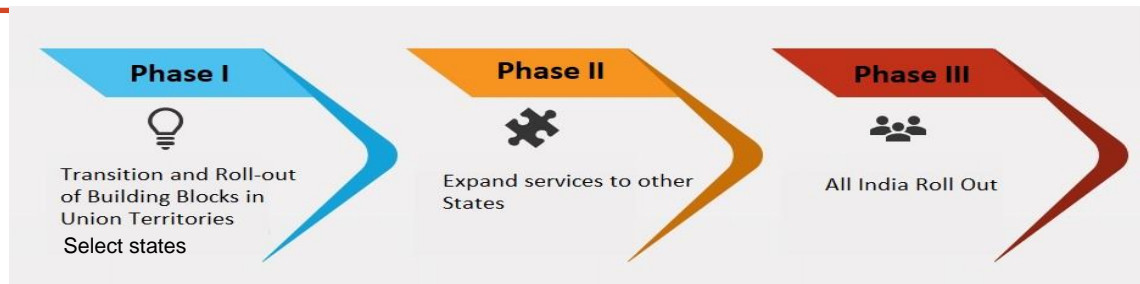
Classification of NDEAR Building Blocks- Building block is simply a package of functionality

CORE BUILDING BLOCKS
- Building blocks built and managed as public goods, are interoperable
- Created and maintained at National/State/ Board Level
- Single Source of Truth and/or System-of-Record (SoR).

COMMON BUILDING BLOCKS
- Building blocks built and offered as a choice to the NDEAR ecosystem
- Must be interoperable.
- May be created and maintained either at Centre or at State/board levels.

REFERENCE BUILDING BLOCKS
- Building blocks built and offered only as "source code/data" to enable various ecosystem to rapidly build their services/ applications.
- To be seen as "accelerators"
- Made available through NDEAR Portal

NDEAR has 12 CATEGORIES
of building blocks with 36 BUILDING BLOCKS across these categories

OPEN STANDARDS & NDEAR PORTAL	FEDERATED IDENTITIES	REFERENCE DATA
Community driven open standards protocols, specifications, knowledge Made available as Open source via NDEAR Portal	Student Teachers Educational Institutions	Master Data/Codes Directories Registries (school teachers students etc.)
INFRASTRUCTURE	**TECHNOLOGY**	**GOVERNANCE**
Education Network & Cloud Messaging & Video / Audio Conferencing Education Data Exchange Open School Hardware	Locker & Consent Management Open AI Services Shared UX Services Language Assets & Services	School Affiliation Awards Recognition Examination, results, Certification Schemes, Programs, Scholarships
ADMINISTRATION	**CONTENT**	**LEARNING**
Personnel & Payroll Admissions, Tests School Management, Attendance Mentoring, Counselling	Contribution & Curation Taxonomy & Tagging Language & Translation Discovery & Personalization	Learn, Do & Practice, Sense & Assess Interaction & Collaboration Credentialing & Boding Learning Infra, Telemetry & Analytics
REFERENCE	**OPEN DATA & ANALYTICS**	**ECOSYSTEM SANDBOX**
Multi-channel, Unified, Coherent, Accessible UX (Mobile, Web, TV, Phone, Radio, Chat, Voice, Etc.)	Open Data, Data Analytics GIS Infra, Visualizations AI/ML	Rules, Tools, Policies, Governance Processes, Certifications

NDEAR: Adoption by States / UTs

Phase I - Roll-out in Select states and UTs:
- Transition and enhancement of already developed building blocks in pilot phase as follows:-
  - a.   Student ID
  - b.   Teacher Registry
  - c.   School Registry
  - d.   Education records
- Enhancement of existing building blocks & Development of new Building Blocks

Phase II - Expansion – States & Services:
- Building Blocks enhanced in Phase I to be rolled out in other States
- Expand additional Building Blocks in these States.

Phase III: Nation-wide rollout & implementation
- This phase will target nation-wide roll-out of all building blocks of NDEAR.

One man BAND- Trying to do all

ORCHESTRA- Synchronous work

Image courtesy: Wikipedia

End of presentation
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