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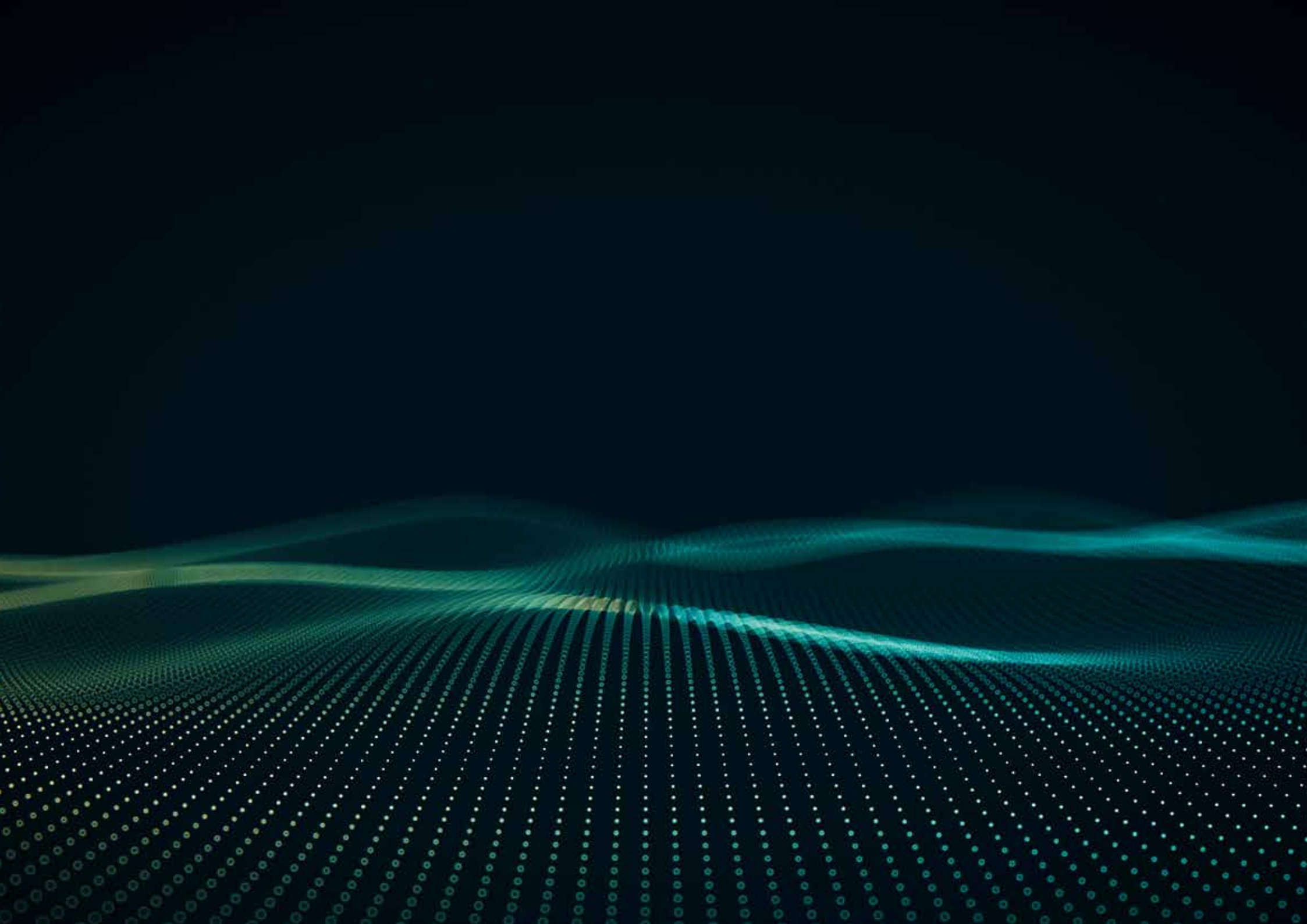
AI + DPI

Artificial Intelligence: The next frontier in Digital Public Infrastructure

September 2024



Romal Shetty
Chief Executive Officer
Deloitte South Asia

Bharat's journey in building Digital Public Infrastructure has set a global benchmark. DPIs have fundamentally changed how we, as citizens, access essential services, engage with the government, and participate in the digital economy. Projections suggest that DPIs could contribute up to 4% to India's GDP by 2030; it's clear just how indispensable this infrastructure is to our future.

The world is increasingly turning to Bharat as a leader in this space. We're seeing groundbreaking innovations emerge regularly—like the RBI's most recent announcement of the Unified Lending Interface. Bharat's growing role as a global hub for transformative and replicable digital solutions is undeniable.

DPI isn't just about tech; it's about bridging gaps in financial inclusion and resilience. It directly supports vulnerable populations in enhancing their access to essential services. It can be used to coordinate large-scale efforts to reduce carbon emissions or provide emergency health services, ultimately leading to a more sustainable and equitable future. The possibilities are endless. This is why, at Deloitte, we've made it our mission to work in this direction.

Last year, we took a notable step by launching the first DPI playbook at Arohana, Deloitte's Government Summit. We aimed to break DPI down to its core components, providing nations with a diagnostic framework to assess their strengths and development areas, helping them forge their own path.

Looking ahead, the integration of Artificial Intelligence with DPI presents unprecedented opportunities. AI could revolutionise service delivery by enabling data-driven decision-making and real-time optimisation. It can also solve language localisation challenges, making DPI more inclusive. However, with these opportunities come challenges—ensuring data privacy, managing risks, and maintaining inclusivity will be crucial to realising AI's full potential within DPI.

This Point of View by Deloitte titled "AI + DPI. Artificial Intelligence: The Next Frontier in Digital Public Infrastructure" sets the stage for exploring how AI can be integrated with DPI, creating a future where technology doesn't just connect us, but empowers us. With this publication, we hope to simplify concepts, share insights, address challenges, and inspire new ideas that will help shape a digital landscape powered by AI +DPI where every citizen can thrive. We're excited to start a new conversation with our readers about the future of AI + DPI.

NSN Murty
Partner
Government Consulting Leader

We are living in an extraordinary time of digital transformation, and India's journey in building Digital Public Infrastructure (DPI) has emerged as a shining example for the world. These efforts have made service delivery more efficient and laid a solid foundation for an inclusive and resilient digital economy. As we look to the future, it's evident that to realise the full potential of DPI, the next logical step is to harness the power of AI.

AI represents an amazing opportunity to reimagine how DPIs can improve efficiency, personalise services and expand their reach to even the most remote areas. However, it is more than just scaling existing capabilities; it's about imagining what's possible.

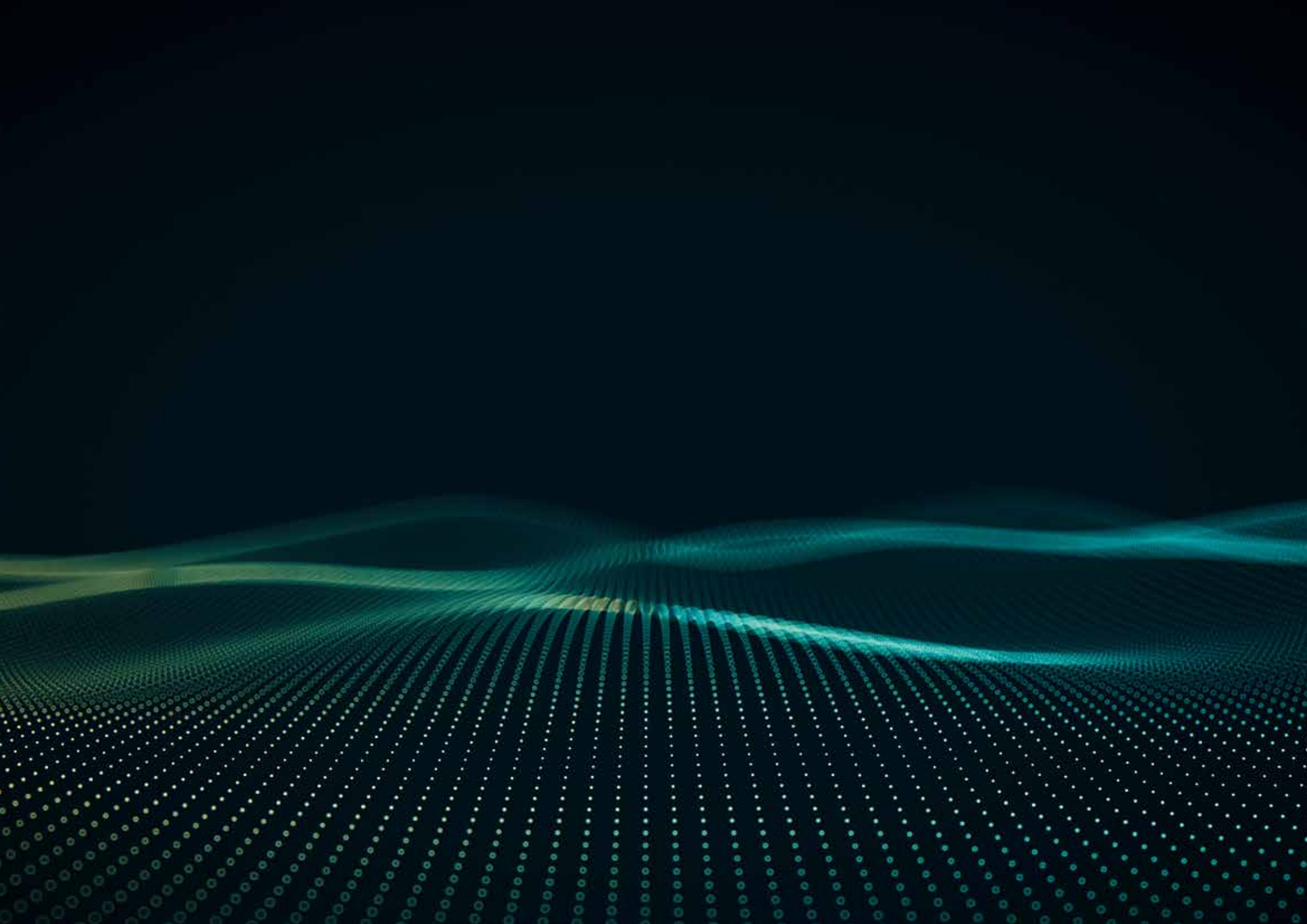
For citizens, this means access to essential services tailored to individual needs and delivered when and where they are needed most. Picture a healthcare system that can anticipate outbreaks before they occur or an educational platform that adapts to each child's learning pace, ensuring that quality education is within reach for everyone.

For policy managers, AI-based real-time data analytics can inform policy decisions, classify and make sense of huge volumes of unstructured (broken data across the country) and increase transparency, leading to a more responsive government.

The fusion of AI and DPI opens many new opportunities for the industry ecosystem. Businesses can innovate using this infrastructure, creating products and services that address the specific needs of a digitally connected population. The insights generated from AI-driven systems can help businesses better understand and serve their customers.

At Deloitte, we are committed to leading this transformation. Our latest release, "AI + DPI: Artificial Intelligence – The Next Frontier in Digital Public Infrastructure," reflects this commitment. We hope this publication sparks conversations and inspires policymakers, business leaders and citizens alike to think differently about how AI can shape our shared digital future. Together, let's work towards a world where technology serves humanity in ways we are only beginning to explore.

Contents



01

Purpose and readership

The Purpose

Hi there, gentle readers! I am SensAI (hope you enjoyed the play of words!). I am going to be your guide in this journey where we break down AI and Digital Public Infrastructure (DPI) into their simplest parts. Together, we will explore how these components can be used to build innovative products for government service delivery and how AI can amplify the power of DPI to make public services more efficient, accessible, and impactful.

At Deloitte, we believe that supporting nation-building begins with empowering governments to deliver direct, measurable, and scalable benefits to their people. Technology plays a huge role in this. When tech is interoperable and has the potential to create network effects, the impact can be even more significant. Digital Public Infrastructure in India has revolutionised governance by connecting billions to essential services, driving financial inclusion, and unlocking new growth opportunities. This is why we advocate for DPI as a critical technology. Deloitte launched the first DPI playbook for nations at the first edition of Arohana, Deloitte's Government Summit, in 2023 as a resource designed to help countries understand, implement, and harness the potential of DPIs to accelerate their digital transformation journeys. Our objective was to break down DPI as a technology to its core block and give nations a diagnostic framework to assess their strengths and development areas and forge their own path.

We're now taking it a step further by learning about AI-powered DPIs with the following objectives:
Explore what an AI-integrated Digital Public Infrastructure might look like in practice.

- Highlight the advantages of combining AI with DPI in improving public service delivery and efficiency.
- Discuss potential risks and challenges associated with integrating AI into DPI, ensuring informed decision-making.
- Inspire new ideas and use cases in the public sector using AI + DPI.
- Discuss possible roles and responsibilities each stakeholder can play for this innovation.

Hi, I am Curio and I'm here to learn with you!

Who is this meant to reach?

Government

Donors and funding agencies

Social entrepreneurs and startups

Technology and service providers

Curious citizens

02

Understanding AI

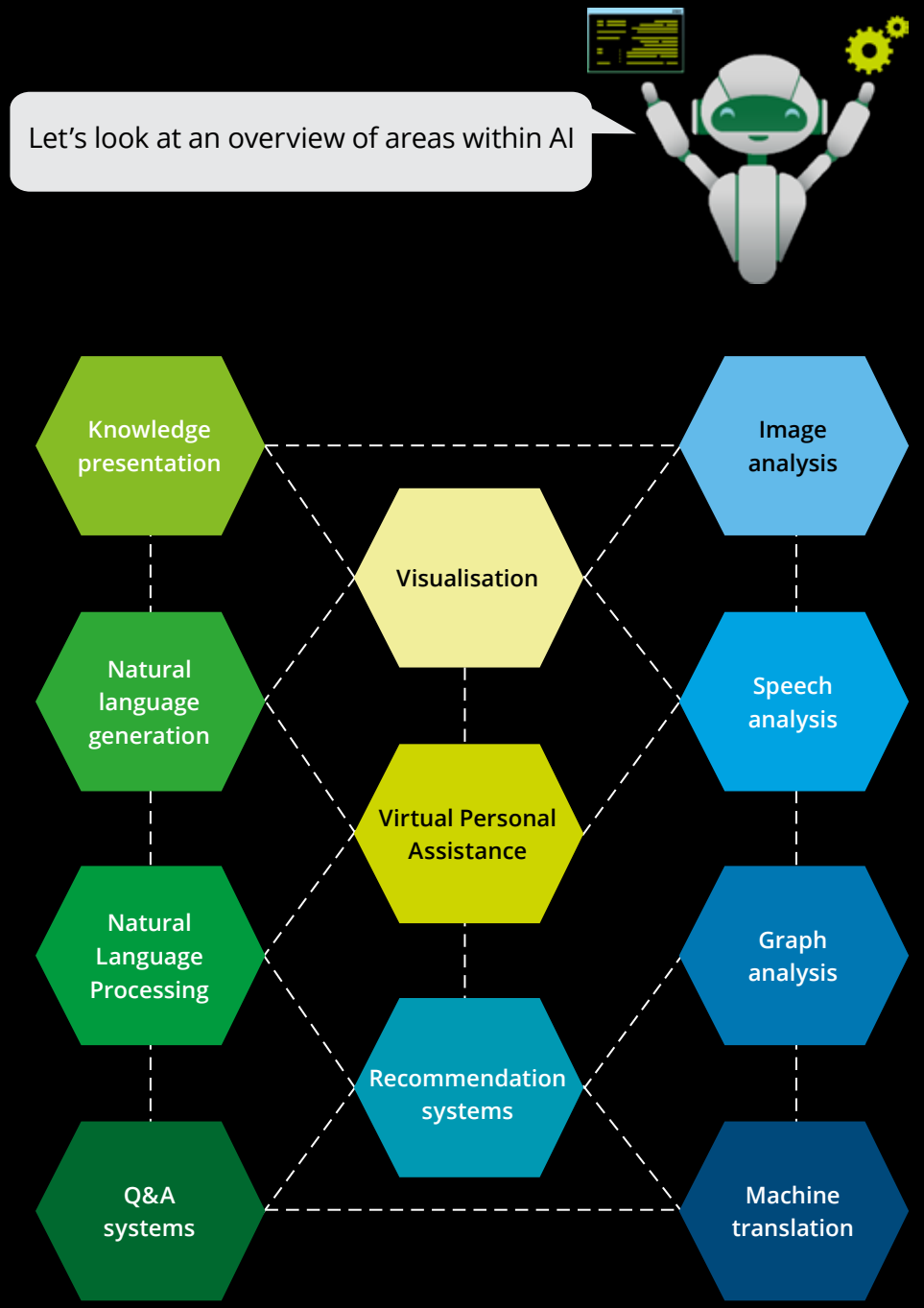
Artificial Intelligence simplified

The term artificial intelligence broadly refers to applications of technology to perform tasks that resemble human cognitive function and is generally defined as “the capability of a machine to imitate intelligent human behaviour. AI systems generally work by ingesting large amounts of labelled training data, analysing that data for correlations and patterns, and using these patterns to make predictions about future states.

AI works by learning from lots of information, just like how we learn new things at school. For example, if you show an AI thousands of pictures of different types of food, it will start to recognise what each type of food looks like. So next time you show it a picture of a pizza, it will know it's a pizza and will also be able to differentiate it from noodles. This process is called "machine learning”.

One of the most common is the virtual assistant (VA) on your phone. When you ask VA, "What's the weather like today?" It understands your question, looks up the weather information, and tells you the answer tailored to your precise location. It feels almost like talking to a helpful friend, but it's actually AI at work.

AI is also behind the recommendations you see on content streaming websites. When you watch a movie or buy a product, AI learns about your preferences and suggests other things you might like. It's like having a personal shopper who knows your tastes very well.



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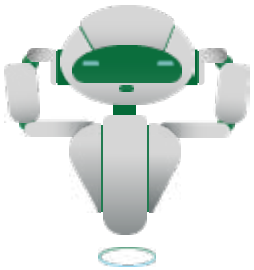
https://www.techtarget.com/searchenterpriseai/definition/AI-Artificial-Intelligence

What’s the buzz around Generative AI?

"I am a cyborg, and I can read minds! You're probably thinking, ‘Alright, AI is cool, but what's all this buzz about GenAI?' How is it different from traditional AI? What implications could GenAI have on DPI? And most importantly, is there anything specific I should be aware of when it comes to GenAI's integration with DPI?“ So let’s jump right into it..



AI

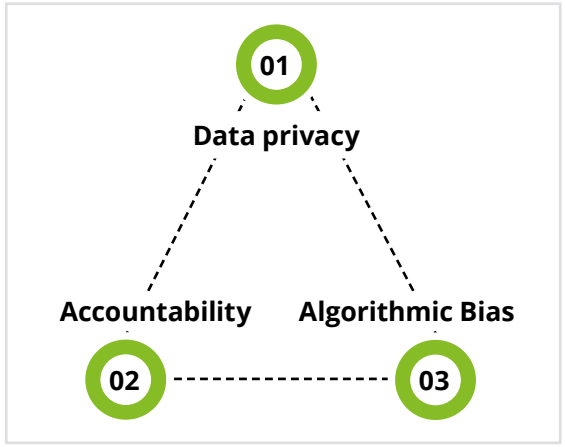
AI is typically designed to recognise patterns, make predictions, or automate specific tasks based on pre-defined rules.

- Typically, outputs decisions, classifications, or predictions
- Often trained on labeled data

GenAI

GenAI is a subset of AI that can create new content, whether it's text, images, audio, code, or even complex simulations, by learning patterns from existing data.

- Outputs original content
- Trained on large datasets to understand and replicate the pattern



IMPLICATIONS OF GEN AI

ETHICAL CONSIDERATIONS

- It can be used to create personalised content and services, improving the overall user experience of DPI systems.
- It can rapidly scale services to meet growing demand without a proportional increase in human resources.
- It can automate content creation for government portals, educational resources, or communication materials.
- It can drive innovation within DPI by enabling the creation of new, AI-driven services. AI could simulate different policy outcomes, helping policymakers make more informed decisions.

https://www2.deloitte.com/content/dam/Deloitte/nl/Documents/deloitte-analytics/deloitte-nl-data-analytics-artificial-intelligence-whitepaper-eng.pdf

03

Unbundling AI

Core components of Artificial Intelligence

Knowledge processing

Representation and reasoning: Machine readable structures, logic and inference from facts, probabilistic reasoning for uncertain information

Sub-sets

Understanding and interaction	Image generation	Noise reduction and enhancement	Model evaluation & optimisation
Language generation	Motion analysis	Speaker identification and verification	Reinforcement learning
Semantics	Object detection and recognition	Speech synthesis	Unsupervised learning
Text processing	Image processing	Speech recognition	Supervised learning

Core components of AI

Natural language processing	Computer vision	Speech comprehension and synthesis models	Machine learning*

*Although a component, machine learning can contribute towards enhancement of several other AI components including NLP, image analyses etc.

NLP in public service delivery: A practical breakdown

Let's break down NLP and understand what it is in simple terms, explore its abilities in governance, and see some practical use cases in public service delivery....

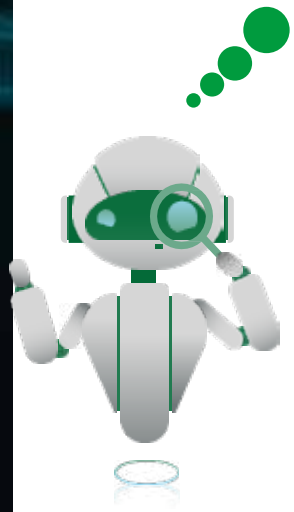
Natural Language Processing (NLP) is a technology that helps computers understand and use human language. It enables machines to read, listen, and communicate with people in a way that feels natural.

Broad practical applications of NLP

- Process, analyse, classify and archive large documents
- Run chatbots for automated public service delivery
- Analyse citizen feedback or call center recordings
- Answer who-what-when-where questions

	Understanding and interaction	Semantics	Language generation	Text processing
Input	Citizen query-“Can you help me apply for unemployment benefits?"	Social media posts regarding public health campaigns like tweets, Social Media comments	Transcripts of a government meeting	Scanned land records and property deeds
Output	Automated response -“Sure, please tell me since when have you been without a job"	Analysis report -"Positive sentiment: 65%, Negative sentiment: 20%, Neutral sentiment: 15%"	Summary report highlighting key points and decisions made during the meetings	Digitised and organised records accessible through an online government portal

Computer vision in public service delivery



Unpacking computer vision! We'll demystify it with easy explanations, uncover its powerful uses in governance, and showcase real-world examples. Ready to explore?

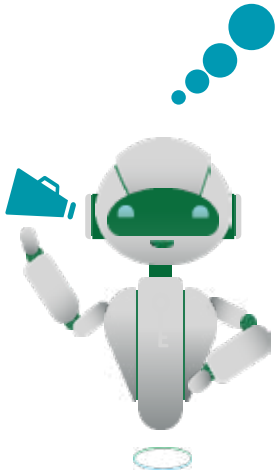
Computer vision lets machines see and understand the world, transforming them into smart helpers that keep our cities safe, traffic smooth, and public spaces clean. It's like giving technology the eyes and brains to make life easier and safer for everyone!

Broad practical applications of computer vision

- Activity detection and surveillance
- Biometric and facial recognition
- Pattern recognition and anomaly detection
- Geospatial analysis and land mapping

	Image processing	Object detection and recognition	Motion analysis	Image generation
Input	Old physical copy of a government document	Surveillance cameras for a city park	Traffic lights on a route	Plan for a new community health centre
Output	Enhanced quality of scanned documents for better machine readability and digital archiving	Track objects in the park, identify unattended bags and alert the relevant authorities	Identify peak pedestrian and vehicle timings to suggest peak timings and appropriate signal durations	3D renderings of the proposed community health centre, including interior and exterior views based on defined requirements

Speech comprehension and synthesis in public service delivery



Let's break down speech comprehension and synthesis into practical elements

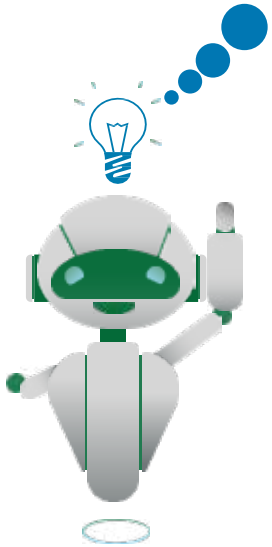
Speech comprehension is like teaching a computer to understand what people say, while speech synthesis is like teaching it to talk back. Imagine having a smart assistant that can listen to your commands and respond with helpful information, just like a human!

Broad practical applications of speech comprehension and synthesis

- Interactive voice response
- Content delivery
- Accessibility solutions
- Training and education

	Speech recognition	Speech synthesis	Speaker identification and verification	Noise reduction and enhancement
Input	In-person community forum discussing local issues	Accessing government services online	Voice sample of citizens applying for social benefits	Emergency response call
Output	Providing accurate records of the discussion for public records allows government officials to review citizen concerns and suggestions in detail.	Assisting citizens, especially those with visual impairments, in navigating online government services through clear audio guidance.	During remote interactions with citizens, Voice Assess can verify the authenticity of the individual, ensuring that public funds are disbursed only to those who are truly eligible.	Improving the clarity and intelligibility of emergency communications, ensuring that critical information is accurately captured.

Machine Learning in public service delivery



Decoding Machine Learning! Let's break it down, explore its wide-ranging uses, and dive into real-world examples.

Machine learning is like teaching a computer to learn from experience, just like humans do. It uses data to recognise patterns, make predictions, and improve over time without being explicitly programmed. Imagine a smart assistant that gets better at helping you the more you use it!

Broad practical applications of machine learning

Predictive analytics and forecasting	Personalisation and recommendation system	Process optimisation and workflow automation	Clustering and classification of data

	Supervised learning	**Unsupervised learning**	**Reinforcement learning**	**Model evaluation and optimisation**
Input	Historical crime data with labeled outcomes (e.g., type of crime, location, time)	Survey responses and feedback from citizens on various public services	Routes and schedules of waste collection trucks	User interaction data with a government service chatbot
Output	Predict where crimes are likely to occur in the future, helping law enforcement allocate resources more effectively	Identifies patterns and clusters in the data without predefined labels, helping government agencies understand community needs and tailor services accordingly	Optimise routes for waste collection by balancing factors like fuel consumption, travel time, and coverage, ultimately leading to more efficient waste management	Evaluating the chatbot's performance helps identify areas where it can be improved, such as better understanding user queries or providing more accurate information

04

A Recap of DPI

Looking back at the DPI playbook for Nations

DPI Playbook for Nations, published by Deloitte in 2023, is a comprehensive resource designed to help countries understand, implement, and harness the potential of DPIs to accelerate digital transformation with inclusive and sustainable economic development. This playbook highlights the role that DPI infrastructures play in enabling interoperability, scalability, and growth across sectors.

How to imagine Digital Public Infrastructure?

The User is here

Apps Layer

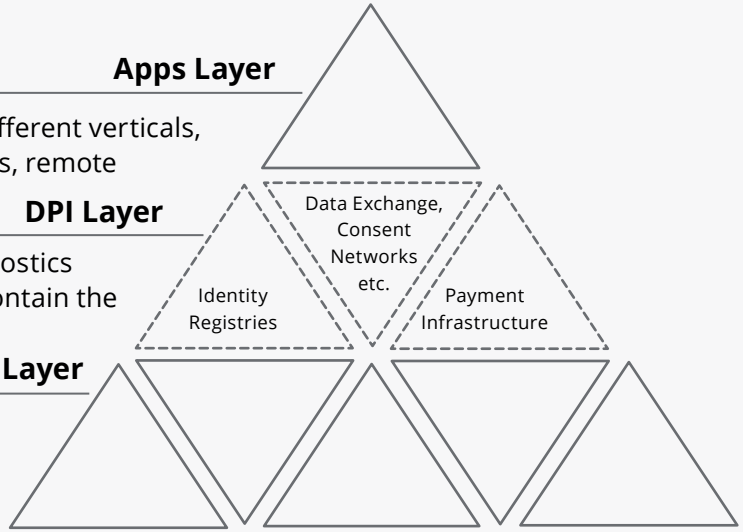
Information solutions to different verticals, e-commerce, cash transfers, remote education, telehealth, etc.

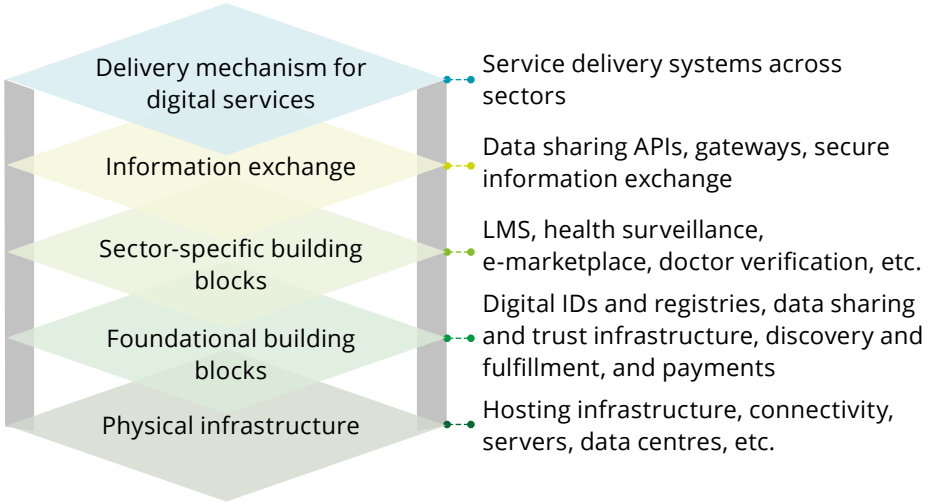
DPI Layer

The connecting, sector agnostics intermediate later which contain the following blocks and more

Physical Layer

The physical layer includes connectivity, devices, servers, data centers, routers, etc.





This architecture can be used by any institution across sectors to build new services without having to redesign the basic infrastructure

DPI Design Principles

Reusable | Integrable | Cost Effective | Customisable | Scalable | Interoperable

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Foundational DPI Building Blocks

IDs and electronic registries | Credentials & Data Sharing | Digital Signature | Discovery & Fulfillment | Digital payments

Deriving inspiration from countries who have done and experienced DPIs

India's DPI story

India's DPI journey has taken massive leaps in the last decade

2.5 billion
Vaccines delivered with digitally verifiable certificates through CoWIN

US$322 billion
Transferred through G2P infrastructure

99%
People in India have a digital identity number in the form of Aadhaar

~6 billion
Secure digital credentials through Digi Locker

Education

The Digital Infrastructure of Knowledge Sharing (DIKSHA) built using Sunbird, is a free-to-use school platform with multiple solutions for students, teachers, and administrators. DIKSHA offers over 8,900 courses and 200,000 pieces of content across 30 Indian languages from 11,500 contributors, reaching approximately 180 million students and 7 million teachers.

Skilling

Since the underlying technology for DIKSHA is available as building blocks, it is being used not just in primary education but also in skill development for COVID-19 training for doctors, nurses, and other health workers.

Health

India built its vaccine distribution and management platform CoWin, built using DIVOC, to scale up vaccine delivery using DIVOC, an open-source software for digital certification. DIVOC was also deployed in four other countries (Indonesia, Philippines, Sri Lanka, and Jamaica) to help facilitate their vaccination programmes.

Finance

Digital payment systems for inter-bank peer-to-peer and person-to-merchant transactions. UPI currently connects more than 50 million merchants as part of its network.

Other areas of DPI intervention

ONDC: Open network for digital commerce built using Beckn protocol

ONEST: Open network for education and skilling transactions built using Beckn protocol

BHASHINI: AI-led language translation platform built using Sunbird and AI4Bharat

National urban stack built using DIGIT

Account aggregator framework built on DEPA to enable secure transfer of financial data

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https://ekstep.org/
https://sunbird.org/
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05

Why do I need AI for my DPI

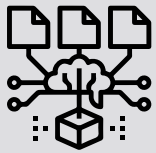
From foundation to future: how AI can enhance our Digital Public Infrastructure

Why pair AI with DPI? Teach me SensAI!

The world is moving towards an experience where every interaction is seamless, whether it's accessing essential services or making financial transactions. This world is powered by DPI, the backbone that supports our daily digital lives.

But as the demand for this infrastructure grows, so do the challenges. The system is powerful, yet it is bound to struggle under the weight of ever-increasing data and complexity. It is like a sophisticated engine running at full capacity but without the ability to foresee problems, adapt to new demands, or optimise its performance in real time.

Now, imagine adding a layer of Artificial Intelligence to this system.



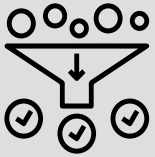
Anticipate needs

Detect inefficiencies

Learns to improve

Personalise services

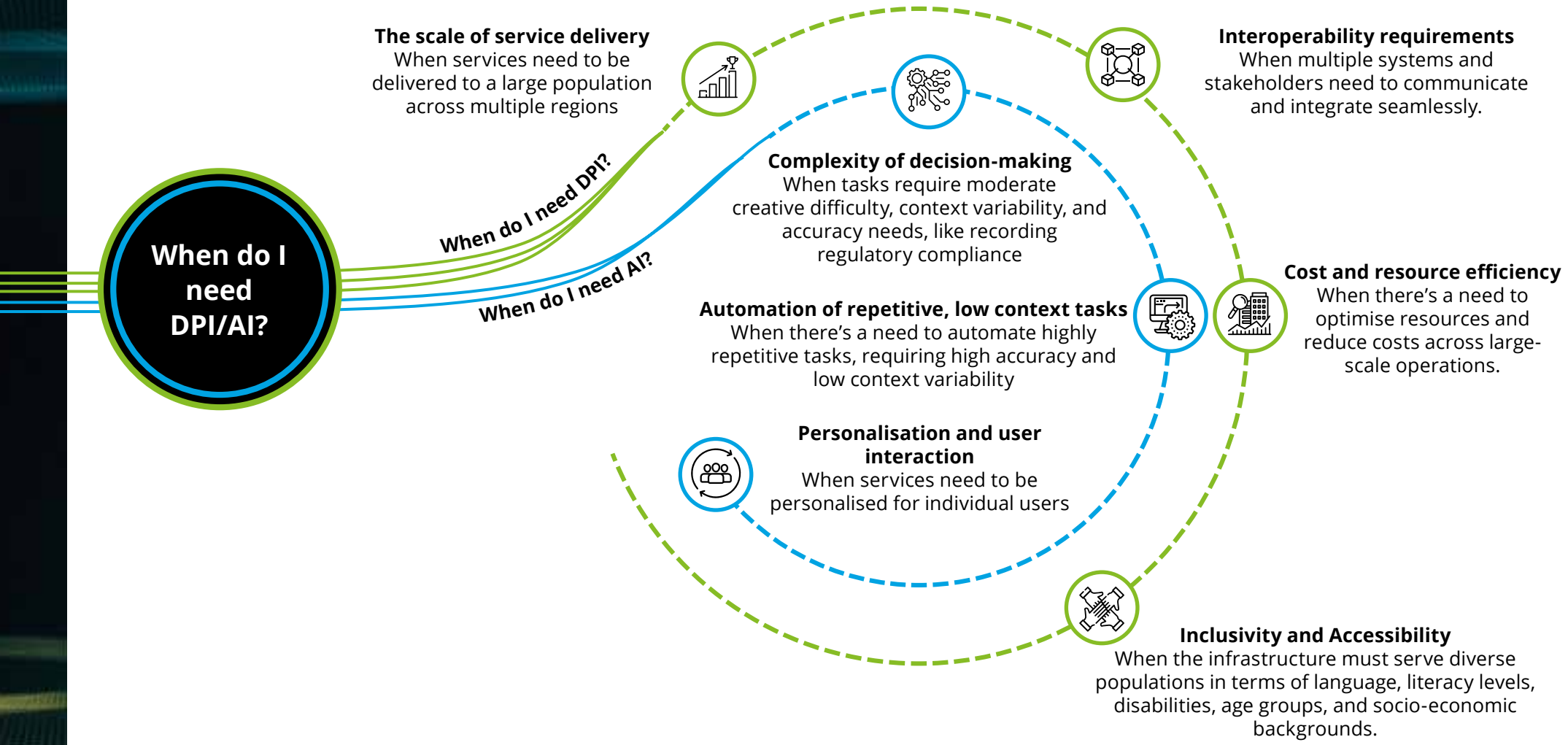
Risk readiness



Data intelligence

With AI, decisions are no longer delayed by the limits of human analysis—they're made in the moment, informed by vast amounts of data processed at lightning speed. Services aren't just provided—they're personalised, adapting to the unique needs of each individual. Risks aren't just managed—they're anticipated and mitigated before they can cause harm. The infrastructure is ready, but AI will allow it to reach its full potential.

When should DPI and AI join forces?


When do I need DPI/AI?
When do I need DPI?
When do I need AI?
The scale of service delivery
When services need to be delivered to a large population across multiple regions
Interoperability requirements
When multiple systems and stakeholders need to communicate and integrate seamlessly.
Complexity of decision-making
When tasks require moderate creative difficulty, context variability, and accuracy needs, like recording regulatory compliance
Automation of repetitive, low context tasks
When there's a need to automate highly repetitive tasks, requiring high accuracy and low context variability
Cost and resource efficiency
When there's a need to optimise resources and reduce costs across large-scale operations.
Personalisation and user interaction
When services need to be personalised for individual users
Inclusivity and Accessibility
When the infrastructure must serve diverse populations in terms of language, literacy levels, disabilities, age groups, and socio-economic backgrounds.


06
Imagine with AI + DPI

The future of traffic management

Scenario

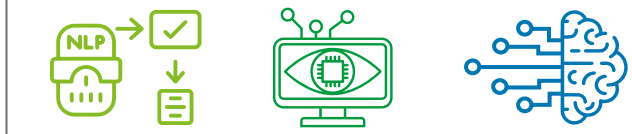
A crowded bus stop with long queues. Buses arrive irregularly, and commuters look frustrated.

With DPI

A mobile app showing bus locations in real time. Passengers can book their tickets in advance. Buses arrive more punctually, and queues start to shorten.

With AI +DPI

AI dynamically adjusts bus routes and dispatches extra buses during peak hours. Commuters board buses with ease. Any bottlenecks and challenges are predicted, and the relevant authorities are alerted in advance.



The future of healthcare

Scenario

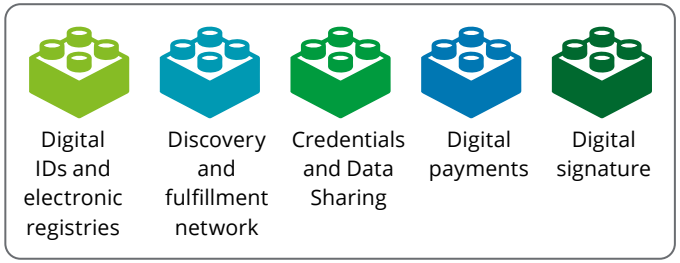
A crowded clinic with long waiting lines. Patients look frustrated as they wait hours for basic consultations. The medical staff is overwhelmed, and resources are stretched thin.

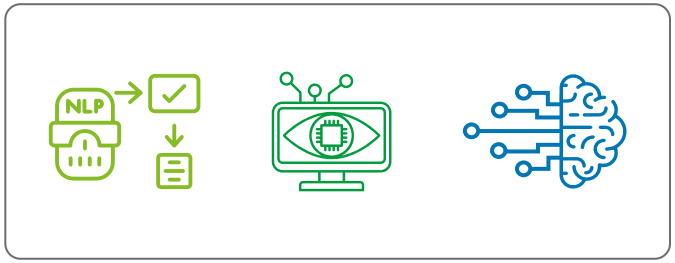
With DPI

A mobile app shows all clinics with available slots in real time. Patients book appointments easily, reducing wait times. Clinics operate more smoothly, and patients are seen promptly.

With AI +DPI

AI-driven systems dynamically adjust appointment schedules and predict patient inflow. Telemedicine options are offered for non-critical cases. Patients receive timely care, and the clinic operates efficiently, ensuring a better experience for everyone.





The future of schools

Scenario

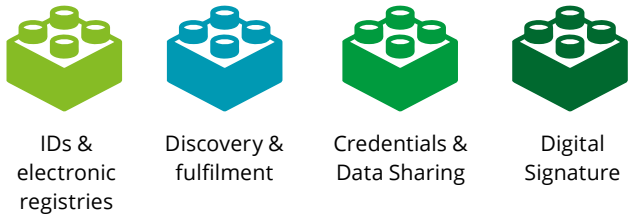
A rural classroom with outdated materials and an overwhelmed teacher. The students are confused and disengaged, struggling to learn in an environment that lacks resources and support.

With DPI

The same classroom is now connected to a digital public infrastructure. Students can access digital learning platforms that offer updated, standardised educational content. The teacher, can provide lessons consistent with national education standards, even in a remote setting.

With AI +DPI

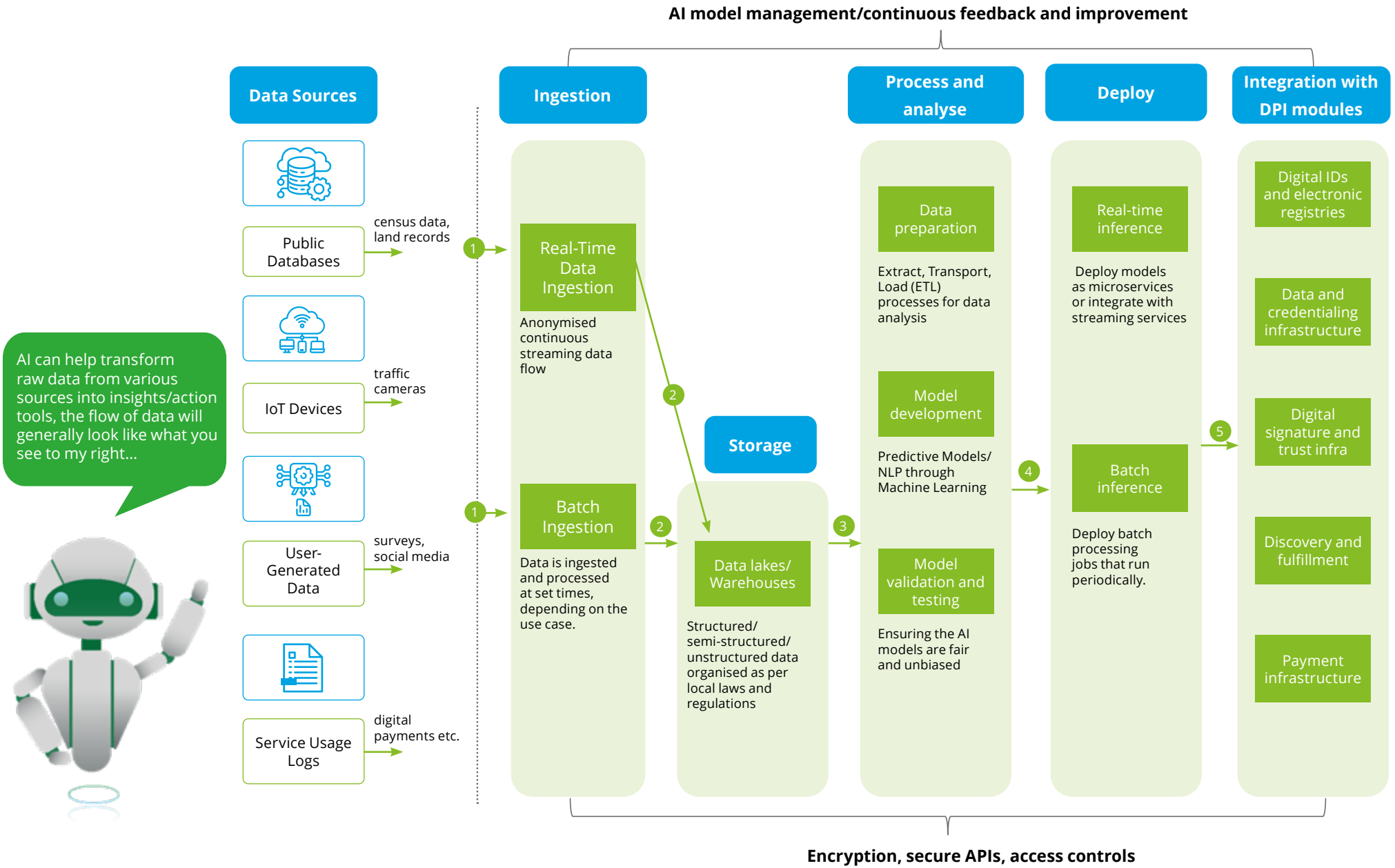
Building on the AI+DPI foundation, each student receives tailored exercises based on their progress and needs, and real-time feedback. The teacher monitors overall progress through AI-driven insights, allowing them to address specific challenges quickly.



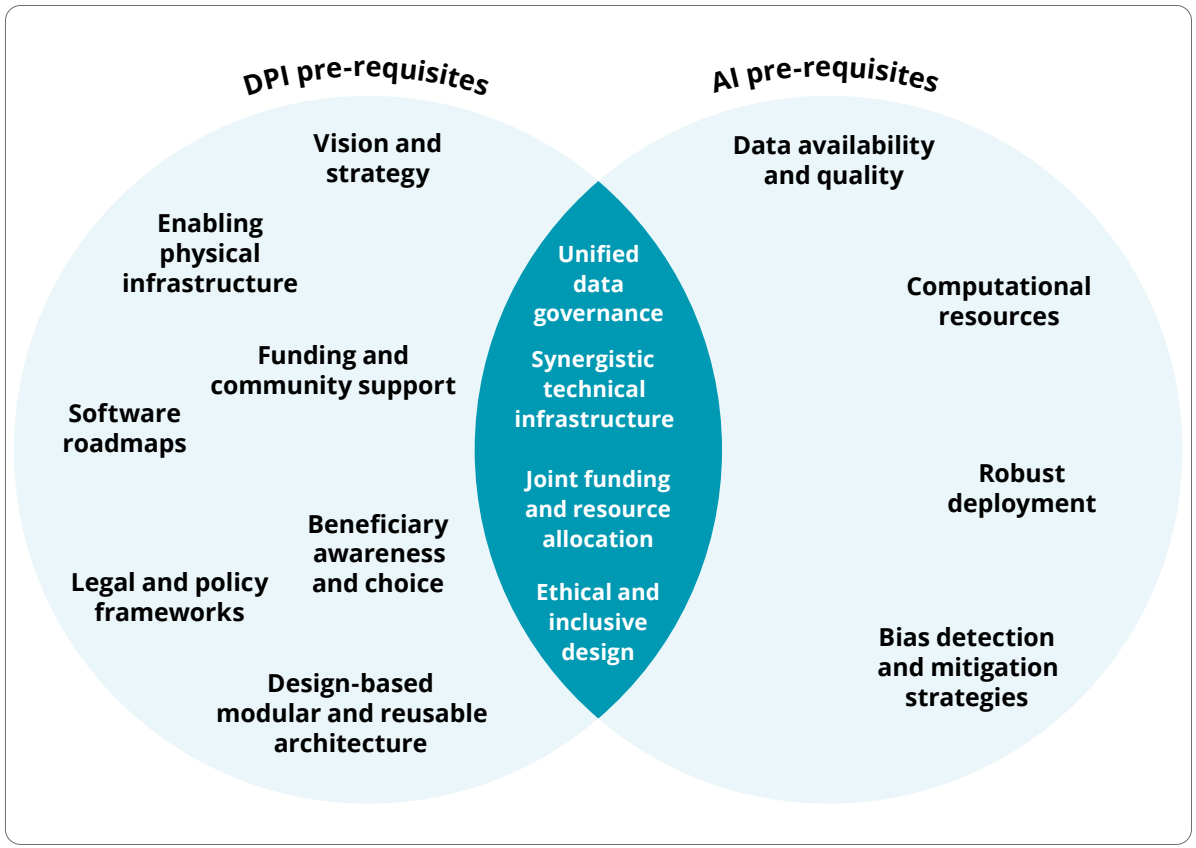
07

How AI components interact with DPI building blocks

A modular breakdown of AI's interaction with DPI



The prerequisites for AI+DPI



Unified data governance: DPI integrates data from various sources, like hospitals and clinics, which may initially use different data standards. If integration isn't well-managed, discrepancies in formats—can lead AI to misinterpret or miss critical data.

Synergistic technical architecture: If the DPIs are not interoperable with AI tools, an AI designed to analyse patient data might face delays or errors because it can't access real-time data from hospital databases. This lack of seamless integration hinders efficient and accurate AI performance.

Joint funding and resource allocation: If DPI and AI projects are funded separately without coordination when AI integration becomes essential, the system might need costly redesigns and upgrades, thus doubling the expense and delaying implementation.

Ethical and inclusive design: If an AI within a DPI is not designed with inclusivity, it might only support major languages, excluding minority language speakers from accessing public services. This lack of ethical design can lead to exacerbated digital divides.

Unlocking value: A cross-section between AI and DPI building blocks

DPI Blocks / AI Blocks	Digital IDs and registries	Discovery and fulfilment	Payments	Digital signature	Credentials and data sharing
Natural Language Processing	• Multilingual identity management • Context-aware citizen assistance	• Conversational product/service discovery • Automated customer-assistance	• Conversational payments • Automated customer support	• Automated document analysis and signing suggestions	• Smart data querying • Multi-language credential access • Dynamic consent management through simple commands
Computer vision	• Biometric based access control • Multi-factor biometric authentication	• Image-based product/service Matching	• Biometric authentication • Document scanning & data extraction	• Biometric signature verification • Document forgery detection	• Automated credential verification • Secure document sharing • Bio-metric linked access
Speech comprehension and synthesis models	• Identity verification via voice biometrics • Voice enabled document signing	• Real-time voice guidance to navigate through catalogues	• Voice-activated payments • Interactive voice response	• Interactive document review and verbal consent	• Hands-free data sharing • Real-time credential verification via speech input
Machine Learning	• Anomaly detection in identity usage • Adaptive identity validation	• Personalised product/service Recommendations • Predictive demand-based fulfillment optimisation	• Fraud detection • Personalised user experience	• Adaptive signature workflow management	• Proactive credential expiry management • Anomaly detection in credential sharing networks

08

Managing AI + DPI

Artificial Intelligence is far from perfect

Bias and discrimination

AI favouring/discriminating against certain Gender/race/religion: Bias in algorithms can result in AI systems favouring one biological or social strata over the other like,

- Men over women
- Not identifying/misrepresenting people of colour
- Unfairly targeting people from one neighbourhood for crimes

Accuracy and reliability

AI hallucination: AI can generate incorrect information, leading to misinformation and harm in areas like healthcare, legal advice, or government services.

Overfitting: AI models may perform poorly on new data, resulting in unreliable predictions in public services like healthcare or social welfare.

Privacy and ethics

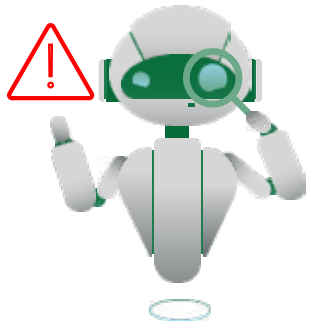
Privacy violations: AI data aggregation can inadvertently expose sensitive personal information.

Accessibility and transparency

Bias in language translation: AI translation might perpetuate cultural biases especially harmful for multilingual societies.

Lack of Transparency: AI models learning methodologies are famously referred to as "black boxes," making it difficult to understand how exactly decisions are made.

AI is a mirror of society; it reflects what we teach it, both the good and the bad. Just like any tool, it's not perfect and comes with its own set of weaknesses. In this slide, we'll explore some of these weaknesses and see how they might play out when AI is combined with public service delivery through DPI.



https://www.jugalbandi.ai/
https://hbr.org/2023/06/managing-the-risks-of-generative-ai

What could be the risks of combining DPI with AI?

Health

A country's interoperable digital health platform integrated with artificial intelligence may generate unfair results, including:

- If the AI model is trained on a dataset that underrepresents certain ethnicities, it might misdiagnose diseases common in those populations or fail to recognise symptoms altogether.
- Patients in remote regions might be offered less-effective treatments due to a lack of data representing their specific health conditions

Law & Justice

A legal network can scale the access of L&J; however, risks associated with adding an AI layer are real. Some of the instances may look like the following:

- AI may not be explicitly and rigorously trained on the specific and contextualised legal context of a region, exposing it to the threat of hallucination.
- AI might recommend harsher penalties for minority groups based on biased precedents leading to discriminatory outcomes.

Policy framework for AI + DPI

Sector specific guidelines

Action: Develop guidelines tailored to sectors like healthcare and agriculture, focusing on transparency, accountability, and human oversight.

Why it's important for AI + DPI: Integrating AI with DPI means these systems will be deeply embedded in public services that millions rely on daily. Clear and sector-specific guidelines ensure that AI enhances the reliability and fairness of DPI, protecting citizens' rights while also fostering innovation that can improve public services.

Infrastructure and data accessibility

Action: Government investment in open cloud computing infrastructure and support for creating inclusive datasets, especially for underrepresented languages and communities.

Why it's important for AI + DPI: DPI relies on robust infrastructure and data to function effectively. Investing in open cloud infrastructure and diverse datasets ensures that AI tools integrated into DPI are scalable, reliable, and inclusive.

Grounded in Indian context

Action: Develop regulations that reflect the maturity, complexity, and aspirations of the Indian AI and DPI market, considering unique challenges like access to foundational models and geopolitical risks.

Why it's important for AI + DPI: India's digital infrastructure must cater to its unique socio-economic context. Tailoring AI regulations to India's specific needs ensures that DPI can leverage AI effectively, addressing local challenges while driving national growth.

AI + DPI policy as a societal reflection

Action: Engage with stakeholders to understand their hopes, fears, and expectations regarding AI. Use this understanding to develop norms and guidelines relevant to the lived experiences of people in India.

Why it's important for AI + DPI: DPI affects every citizen, so AI policies must be shaped by the people who will be most impacted. By involving a broad range of stakeholders, we ensure that AI in DPI is developed in a way that is socially acceptable, equitable, and aligned with public needs.

Enabling environment AI + DPI

Action: Invest in key enabling factors like compute infrastructure, data availability, and talent development. Use broader economic policies to support AI growth beyond just governance.

Why it's important for AI + DPI: For DPI to effectively integrate AI, the underlying infrastructure must be strong and capable of supporting AI's demands. By addressing barriers in compute, data, and talent, we create a fertile environment for AI to enhance DPI, leading to better public service delivery.

Incentivise AI + DPI for good

Action: Develop policies that incentivise the creation of AI tools and solutions aimed at solving market failures and promoting equity.

Why it's important for AI + DPI: AI has the potential to address deep-rooted inequalities in society. By directing AI development towards social good in cohesion with DPI, we can ensure that the benefits of AI are shared widely and help build a more inclusive future.

https://peopleplus.ai/blog/dpi-to-the-power-of-ai
https://coda.io/@peopleplusai/people-ai-projects

How do we ensure responsibility and accountability?

Managing AI liability is not just about ensuring compensation; it's about building trust in the digital age. To protect both consumers and businesses, we must adapt our legal frameworks to the realities of AI, where traditional concepts of fault and responsibility are often blurred. By creating clear and consistent rules, we can foster innovation while safeguarding the rights and safety of all.

CLEAR ASSIGNMENT OF RESPONSIBILITY

- Define roles and liability
- Assign responsibility appropriately

SECTORAL LIABILITY

- Tailor liability guidelines
- Stricter rules in high-risk sectors

HUMAN OVERSIGHT

- Necessitate human intervention
- Provision to override AI decisions whenever necessary

LEGAL AND REGULATORY CLARITY

- Establish consistent legal standards
- Create/Amend AI-specific laws

Partnership ecosystem for AI-enhanced DPI

As nations get ready to integrate AI into their Digital Public Infrastructure, the success of this transformation relies on a dynamic partnership ecosystem. This ecosystem unites strategic decision-makers, tech innovators, implementation partners, and ethical watchdogs, each contributing their expertise to create AI-enhanced systems that are secure, efficient, and aligned with public needs. By fostering these collaborations, countries can build a future where AI and DPIs work together to revolutionise public service delivery globally. This model provides a base roadmap for understanding and categorising these partnerships, laying the groundwork and providing direction to any country willing to start their AI + DPI journey.

01 **IDENTIFY** the key outcomes, such as improving service delivery, enhancing security, or increasing accessibility

02 **EVALUATE** current DPI capabilities and identify gaps that AI can fill with most impact

03 **MAP** the stakeholder ecosystem guided by the given model based on their respective roles

04 **SECURE** strategic and financial support. Consider their alignment with the country's objectives and their willingness to invest in long-term projects

STRATEGIC DECISION MAKERS

- National Govt. and Govt. Agencies
- International orgs and development banks
- Intergovernmental bodies and regional alliances
- Philanthropic foundations

TECHNOLOGY INNOVATORS

- Tech giants and cloud service providers
- AI startups and specialised tech firms
- Telecommunication and networking companies
- Research institutions and universities

IMPLEMENTATION PARTNERS

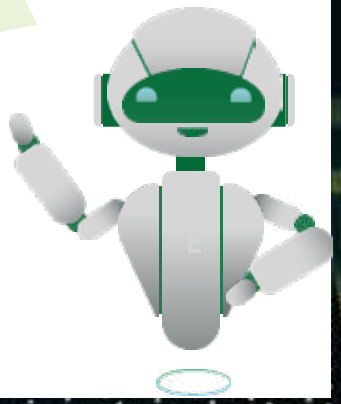
- Public-Private Partnerships
- System integrators and IT consulting firms
- Government contractors and vendors
- Logistics and supply chain partners

ETHICAL OVERSIGHT BODIES

- Civil society organisations and NGOs
- Ethics committees and advisory boards
- Data protection and privacy regulators
- Standards bodies and certification authorities

Key considerations while choosing your partners:

- Assess the experience of partners in handling similar large-scale public sector projects.
- Choose partners who can offer scalable solutions that can grow with your country's evolving digital needs.
- Ensure that the partner's technology and solutions are interoperable with existing systems. This is critical for seamless integration into your current DPI.



09

AI as a DPG

AI as a DPG

What are DPGs?

- Platform independent
- Open approved licenses
- Have clear ownership
- Adhere to data privacy and security guidelines
- Documented source code

The concept of DPGs offers a compelling framework to envision AI in a way that prioritises public interest, accessibility and ethical standards. Here's how AI can meet the standards of a DPG:

Deeper implications of AI as a DPG

Catalyst for global digital inclusion

Scalable solutions that bring digital literacy, connectivity, and technology to underserved populations

Global environmental stewardship

Monitor climate change and optimise resource usage by developing open-source AI tools that aid in environmental conservation.

Crisis management and disaster response

Manage crises, such as natural disasters, pandemics, or conflict situations by processing vast amounts of data in real-time

Shape future economic models

Support cooperative economic systems, where communities collectively own and manage resources

https://digitalpublicgoods.net/AI-CoP-Discussion-Paper.pdf

10

Notable case studies

Jugalbandi AI

Jugalbandi (or JB) is an **AI-powered LLM stack** built as a part of OpeNyAI Mission, that can be used as both an **information and action** tool for citizens/users of all scales.

Sample user journey with JB

Ministry of Rural Development's Jugalbandi Powered Chatbot Grameen Sahayak has information on all schemes of the ministry

Lata has a social networking app at her disposal but is unaware of any schemes she qualifies for.

Lata sends a VN in Kannada with a vague question – "What benefits am I eligible for?"

Bot understands her query and through a set of conversational questions, leads her to all the schemes she is eligible for and clarifies any question she has on it

Through WA based form, she can also apply for the scheme she is eligible for

Salient features

- **Multilingual-** Can be operated in 12 languages supported by BHASHINI speech models
- **Multimodal-** Can receive and send text and VN, both benefiting low literacy population
- **Scalable-** Can be scaled to millions of users
- **Customisable-** Customise every aspect, including language model and LLM
- **Interoperable-** Works with any protocols and standards such as ONDC protocol, PULSE protocol
- **Cloud agnostic-** Easy to customise On-Premise
- **Open source and easy to deploy and run**
- Can be integrated with action tools **used in governance such as e-kyc, e-sign, payments, wallets, etc.**

What makes Jugalbandi an AI

- Jugalbandi stack is built on open-source technology, with most of its components freely available. This enables a seamless integration with translation tools like Bhashini or any other such tool of one's choice. It is also interoperable with open networks like ONDC or any future networks that may arise in India or globally.
- It lowers barriers to accessing essential services and information, including for the underserved communities. By enabling communication in native languages through simple, user-friendly interfaces, it makes digital services more inclusive and accessible.
- The stack's adaptability allows it to be scaled and customized for different contexts. Communities can easily tailor Jugalbandi to meet their unique needs.

https://github.com/OpenNyAI/Jugalbandi-Manager
https://www.jugalbandi.ai/

AI applications in Singapore's Digital Public Services

The Singapore government has been actively investing in the development and deployment of AI and is being recognised as a global leader in AI.

JumpStart Job Portal

AI Tools

Help residents find jobs, review career options and explore new job opportunities. The self-help online portal also matches local job seekers with local employers. Machine learning enhancements allowed the system to recommend potential job candidates, including those who met the requirements but applied to jobs in other areas. Seven months after JumpStart's launch, more than 5,000 job seekers had secured jobs through Jumpstart-enabled recommendations.

Safe Distance @ Parks

AI Tools

During COVID-19 Singapore created a tool that combines input from the parks' video streams with data about car park occupancy to determine how many people are in green spaces across Singapore in near real time. In 2020, monthly traffic to the app peaked at 620,000 visits per month. In 2021, this traffic stabilised to around 400,000 visits per month. The app automated people-counting, reducing the need for human enforcement staff by two thirds.

FASTER: Urban Transit

AI Tools

FASTER is an AI-powered data fusion platform that mines data from IoT sources, including video streams, WiFi and cellular signals, farecard data, train engineering and flow data, and taxi and other transport data to immediately warn of potential rail anomalies. The system makes the entire urban rail network visible around the clock. Initially, FASTER was able to predict about 40% of impending incidents. By 2019, it could predict 80%, and by the end of 2021 it approached 90%.

https://mbrjournal.com/2023/07/25/singapores-ai-applications-in-the-public-sector-six-examples/

11

Call to action

Call to action

Government

- Develop a clear strategy for AI in DPI, focusing on transparency and inclusivity.
- Allocate resources for infrastructure and inclusive datasets.
- Establish ethical regulatory frameworks and enhance digital literacy through training.
- Empower communities with skills to engage with AI-powered DPI.

Donors and funding agencies

- Provide targeted funding for AI-DPI integration projects, prioritising initiatives that enhance inclusivity and sustainability.
- Support research and development of AI solutions tailored to public needs.
- Collaborate with governments and other stakeholders to ensure effective deployment of AI technologies.

Social entrepreneurs and startups

- Create AI solutions that serve marginalised communities.
- Advocate for ethical AI use and fairness.
- Create communities with skills to engage with AI-powered DPI.

Technology and service providers

- Develop and offer AI tools that integrate seamlessly with existing DPI systems, ensuring scalability and interoperability.
- Focus on creating solutions that address public sector challenges, such as improving efficiency and accessibility.
- Work closely with governments and other stakeholders to tailor technologies to local needs and contexts.
- Empower communities with skills to engage with AI-powered DPI.

Empowered citizens

- Engage with AI-powered digital public services and provide feedback.
- Advocate for transparency, data privacy, and demystification of AI-driven DPI.
- Enhance digital skills to benefit from AI-powered DPIs.

"To unlock full potential of AI + DPI we must ensure equitable access to its building blocks and foster an environment where innovation thrives across all sectors. Together, we can drive growth, enhance governance, and create opportunities for all, while maintaining strategic autonomy."

A pledge

- Civil society, policy makers and industry ecosystem each to work towards clear and understandable explanations of how AI systems are integrated into DPI
- Inform users when they are interacting with AI-powered public services or AI-generated outputs within the DPI framework, ensuring they understand the context and the role AI plays.
- Robust grievance redressal mechanisms specifically designed for AI-driven public services, addressing concerns or complaints promptly and fairly.
- Actively monitor and update our AI systems within the DPI to prevent misuse and encourage users to report potential issues.
- Commit to transparency and accountability through regular external oversight and reporting, especially after significant developments, to ensure public trust.

Connect with us

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