SESSION 6 · KEYNOTE · GWF 2026

Building a Trusted National Land Stack

GKI Across Cadastre, Registry, Valuation and Planning

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Vice President, Ikatan Surveyor Indonesia



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Amsterdam, May 2026

Indonesia Today

The Paradox of Progress

#28

GKI Readiness Index 2025

#4 of 5 country · Geospatial World 2025

123mil.

Registered Land Parcel

~98% target · ATR/BPN, Mar 2025

3.23

Argrarian Conflict 2015-2024

4,44mil. ha · 1,8 mil. HH · KPA 2025

40%

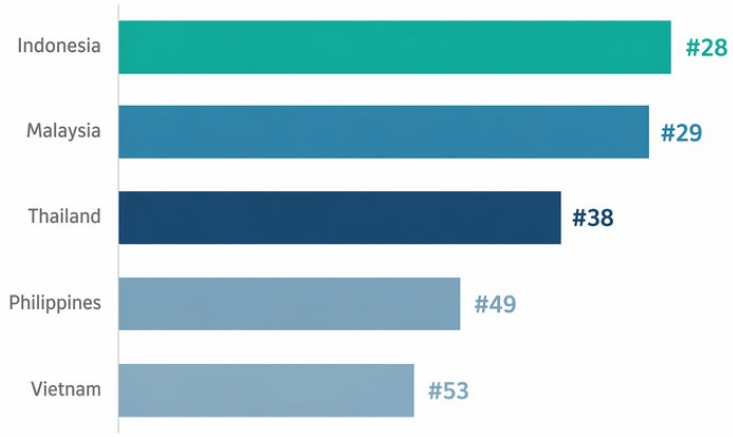
Re-Distribution Realization Target

1,8 mil. of 4,5 mil. ha · Mongabay 2025

The Paradox

Land registration is nearly complete, yet agrarian conflict is at a historic high, land distribution has barely moved, and 68% of agricultural land is controlled by just 1% of the population. Registration alone is not governance.

Indonesia Position at ASEAN (GKI 2025)



Why Do Conflicts Persist?

- Land registration alone does not guarantee legal certainty.
- A System of Nine Interlocking Failures
- Data remains fragmented, valuations are unreliable, and enforcement is weak.
- Political considerations often override rule-of-law–based approaches.
- Indonesia needs an integrated intelligence layer, not just a registration system.

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The 9 Systemic Issues

A structural diagnosis — not isolated incidents, but an interlocking system of failures

01 Registry Duplication

Institutional Fragmentation

Ministry of Agrarian Affairs and Spatial Planning / National Land Agency, Ministry of Environment and Forestry, Ministry of Energy and Mineral Resources & regional bodies each maintain independent registries — 14.4 million hectares still uncharted (ILASP 2024)

02 Weak Guarantee System

Negative Registration System

Indonesia uses a negative system, a certificate is evidence, not conclusive proof. Titles can be challenged & overturned in court

03 Partially Digitized, Opaque Processes

Online Services Underimplemented

Land services still require in-person visits; opacity creates rent-seeking channels. Rural & eastern Indonesia lag far behind Java

04 Centralized Measurement Authority

Surveyor Bottleneck

Only BPN-certified surveyors can demarcate land, far too few for 126M parcels across 17,000 islands

05 Document-Based Certification

Paper Primary System

Physical paper certificates remain the legal instrument. Vulnerable to forgery, fire & fraud. E-Sertifikat (2021) still supplementary

06 Outdated Regulatory Framework

UUPA 1960 — 65 Years Unreformed

UUPA Law No.5/1960 predates digital systems, satellite mapping & modern investment law. Omnibus Law created parallel framework creating legal dualism

07 Illegal Occupation

Corporate & Community Encroachment

154 PSN-related conflicts 2020-2024, affecting 103,000 families & 1M hectares. Only 1.8M of 4.5M hectares redistributed

08 Low Law Enforcement

Impunity for Violators

2,841 criminalizations, 1,054 assaults, 88 shootings, 79 deaths linked to land disputes (2015-2024, KPA). Court orders routinely ignored

09 Political Considerations Overriding Legal Frameworks

Political Economy of Land

PSN expanded from 89 to 204 projects between 2019 and 2024, overriding community rights. Land redistribution announced at elections, underdelivered after

TheJakartaPost
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INDONESIA • SOCIETY

Navy taking down 'mysterious' sea fence that sparked reclamation debate

Radhiyya Indra (The Jakarta Post)
Jakarta
PREMIUM • Mon, January 20, 2025

Gift Full Article



A plane passes over residential high-rises on Jan. 9, 2025, behind a mysterious bamboo fence of 30 kilometers in length in the coastal waters of Tangerang, Banten. (Antara/Sulthony Hasanuddin)

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Land Mafia and Its Legal Consequence in Indonesia

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January 22, 2024 | 10:58 am

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The Broken Chain

From Systemic Issues to Real-World Consequences

Causal Chain of Systemic Land

01 

Unreliable Data

Duplicate Registries · Incomplete Surveys · Physical/Paper-Based Systems

02 

Unguaranteed Rights

Negative Titling System · Cancellable Certificates · UUPA 1960

03 

Inaccurate Valuation

NJOP Significantly Below Market Value · PMK 85/2024

04 

Ineffective Enforcement

Court Rulings Routinely Ignored · Systemic Impunity · Political Override of Legal Process

05 

Fragmented Systems

Data Silos · Manual Processes · No 3D/Digital Twin Framework

Tangible Impact



Investment Barrier

3,234 agrarian conflicts recorded 2015–2024 · 7.4 million hectares in dispute. Legal Uncertainty Over Land Rights as the Primary Barrier to Foreign & Domestic Investment

KPA, Mongabay 2025



Widespread Social Conflict

1.8 million households affected · 2,841 criminalizations · 1,054 cases of physical violence · 79 deaths (2015–2024)

KPA via Tempo, Sept 2025



Environmental Degradation

154 conflicts linked to National Strategic Projects (PSN) 2020–2024 · 20 million hectares of forest earmarked for food estate conversion

Mongabay, Jan & Mar 2025



Erosion of Fiscal Potential

68% of agricultural land held by 1% of the population · NJOP-to-market value gap unresolved · PBB/BPHTB revenue chronically sub-optimal

JHCLS 2025; PMK 85/2024

The answer requires more than registration, it requires an integrated intelligence system that connects data, rights, value, and policy into verifiable decisions.

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The Government Response

WORLD BANK · PRESS RELEASE · 30 SEPTEMBER 2024

…nd Reform

Integrated Land Administration and Spatial Planning (ILASP)

$653M IBRD Loan · 5 Years (2025–2029) · Signed 5 Dec 2024

Implementing: ATR/BPN (lead) + BIG + Ministry of Home Affairs

$105M

Climate-Informed Spatial Planning

500+ RDTR spatial plans with climate resilience integration

$177M

Strengthening Land Tenure

Accelerating agrarian reform & systematic registration

$45M

Land Information System & Valuation

Modernizing LIS, NJOP alignment, property valuation

$292M

Large-Scale Base Maps for Climate

BIG national basemap, mapping 14.4M ha uncharted land

$34M

Project Management & Capacity Building

21,500 stakeholders trained, 20% female target

Why ILASP Alone Is Not Enough

- ILASP focuses on registration & spatial planning, it does not build decision intelligence or simulation capability
- No AI/machine learning component for conflict prediction or land-use change detection
- No financial intelligence layer, NJOP-to-market alignment, fiscal optimisation, investment feasibility are out of scope
- No Digital Twin framework - 3D modelling, scenario simulation, policy impact assessment require a separate platform

ILASP builds the foundation. InaTwin builds the intelligence layer on top of it, connecting data, rights, value, and policy into decision-ready governance.

Roadmap To Digital Twin

Based on Indonesia's 9 Systemic Issues & Governance Readiness - 5 Phases of Transformation

Indonesia is already in Phase 1 & 2. **PTSL** (Complete Systematic Land Registration Program) nearing completion, One Map Policy underway, World Bank ILASP $653M approved Sept 2024. 14.4M ha still uncharted.

In Progress

01 Data Refresh

Trusted, complete & interoperable national geospatial data foundation

Complete PTSL · Harmonise BPN, BIG, KLHK & ESDM · LiDAR & drone surveys · Map remaining 14.4M ha

Fixes: Issues 01, 02, 05

In Progress

02 Geospatial Integration

Unified, trusted source of truth across all land data

One Map Policy 2.0 · SPBE API integration · National Geospatial Portal · Single parcel schema

Fixes: Issues 01, 03, 05

Planned

03 3D Built Environment

Deeper spatial intelligence through 3D & subsurface modelling

City-scale LoD2/LoD3 · BIM-GIS integration · Underground mapping · 3D cadastre framework

Fixes: Issues 04, 06

Planned

04 Connected Data Ecosystem

Living spatial model powered by IoT, sensors & live data

Satellite AI change detection · Concession boundary monitoring · Dynamic cadastral updates

Fixes: Issues 07, 08

Vision

05 End-to-End Digital Twin

Predictive, decision-ready land governance at national scale

Scenario simulation · Conflict-risk prediction · Policy impact assessment · Full GKI integration

Fixes: Issues 07, 08

Each phase directly addresses specific systemic issues, and each is an entry point for collaboration.

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Introducing

inaTwin

Building Indonesia's first end-to-end geospatial decision platform, connecting the National Land Stack across cadastre, registry, valuation, and spatial planning into one AI-powered, policy-aligned intelligence system designed to resolve all 9 systemic issues.



What we've built

Property Tax Analytics Dashboard

Operational dashboard integrating NJOP spatial data with market analytics, directly addressing the valuation gap mandated by PMK No. 85/2024.

What we're building

National Digital Twin Platform

End-to-end geospatial decision intelligence- Spatial, AI, Financial & Policy layers, built specifically to solve Indonesia's 9 systemic land governance issues.

Spatial

AI

Finance

Policy

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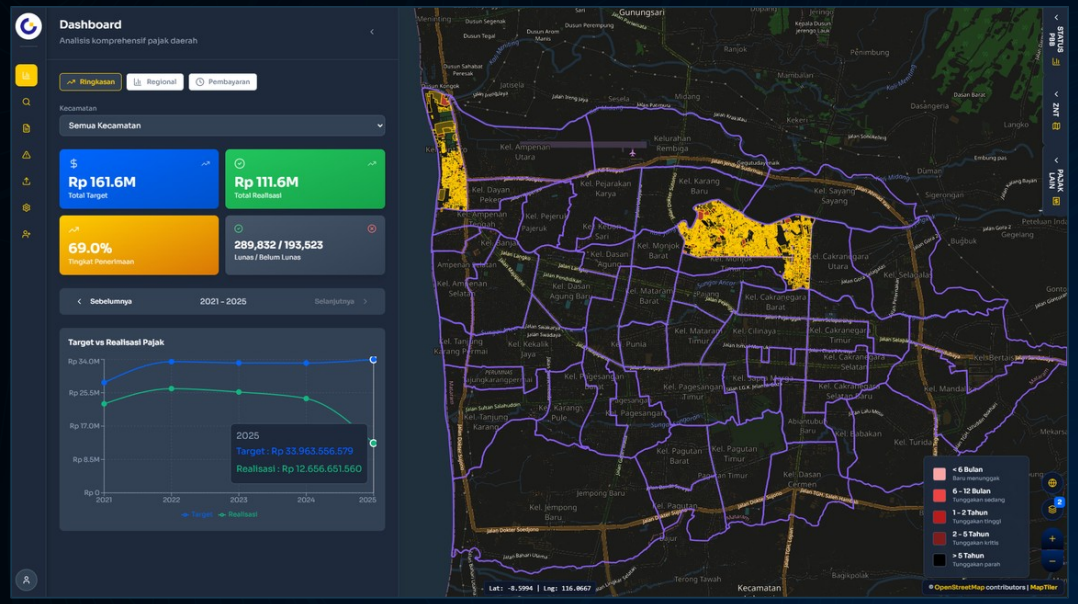
InaTwin in Pratice

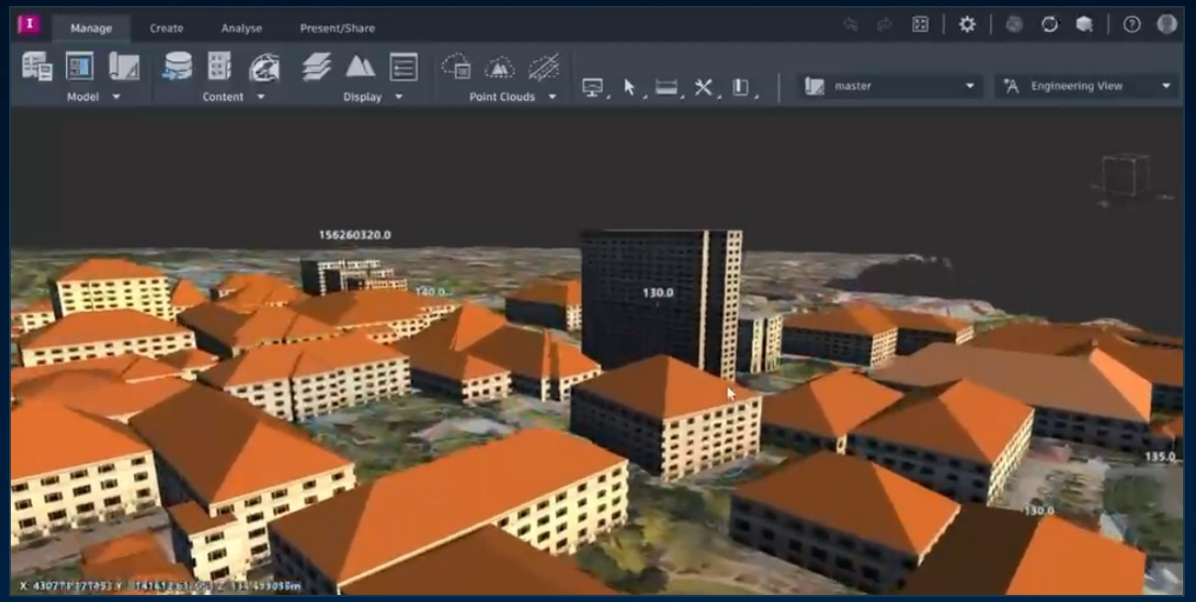
Today and Tomorrow

TODAY — Property Tax Analytics Dashboard



- Spatial visualisation of property tax objects per zone - Issues 01 & 03
- NJOP vs market value gap analysis, directly addressing PMK 85/2024 - Issue 03
- PBB/BPHTB revenue potential dashboard for regional government - Issue 03

TOMORROW — National Digital Twin Platform



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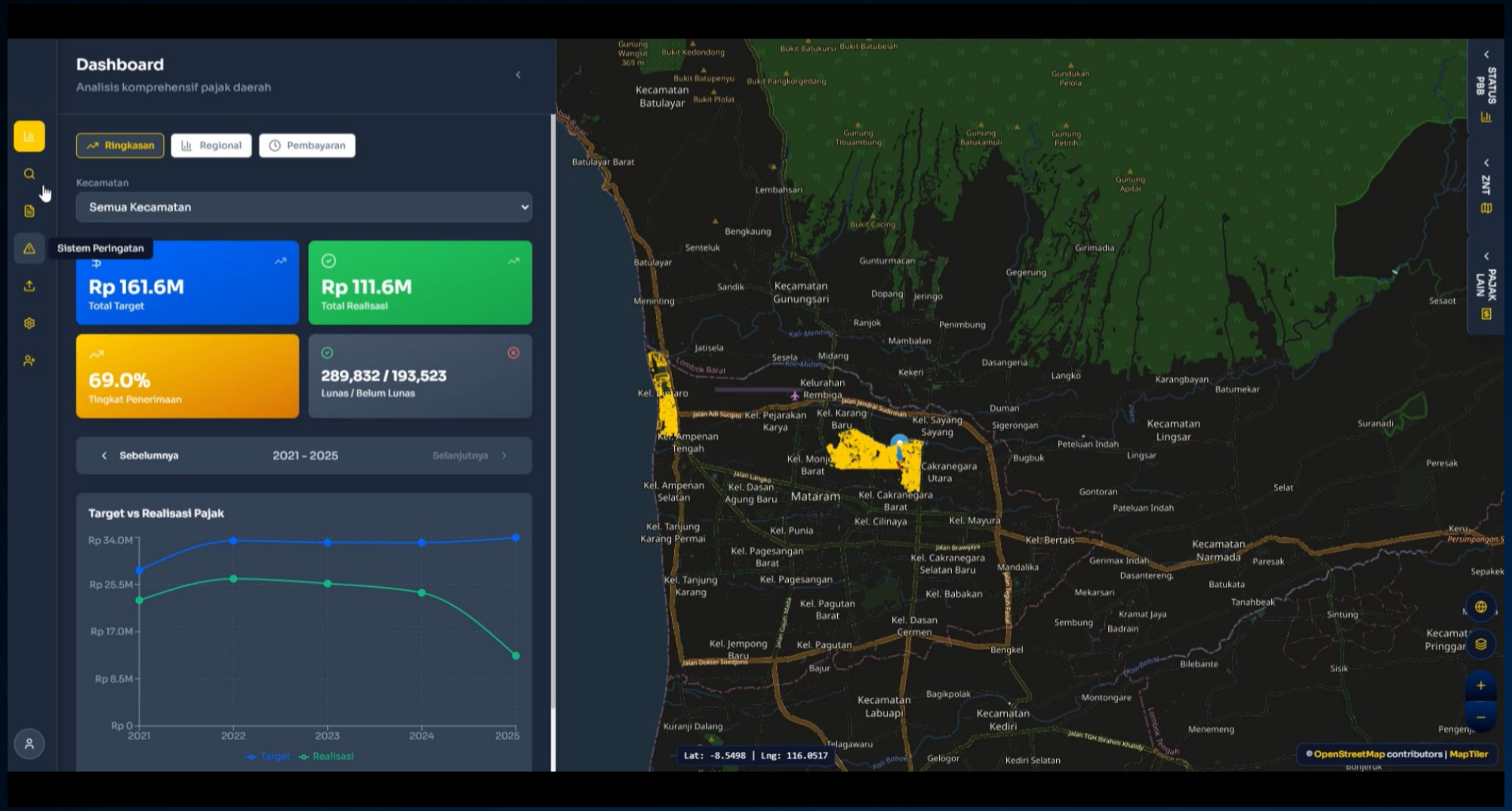
Dashboard
Analisis komprehensif pajak daerah
Ringkasan
Regional
Pembayaran
Kecamatan
Semua Kecamatan
Sistem Peringatan
Rp 161.6M
Total Target
Rp 111.6M
Total Realisasi
69.0%
Tingkat Penerimaan
289,832 / 193,523
Lunas / Belum Lunas
Sebelumnya
2021 - 2025
Selanjutnya
Target vs Realisasi Pajak
Rp 34.0M
Rp 25.5M
Rp 17.0M
Rp 8.5M
Rp 0
2021
2022
2023
2024
2025
Target
Realisasi
STATUS PBB
ZNT
PAJAK LAIN
Kecamatan Batulayar
Kecamatan Gunungsari
Kecamatan Lingsar
Kecamatan Narmada
Kecamatan Labuapi
Kecamatan Kediri
Mataram
Lat: -8.5498 | Lng: 116.0517
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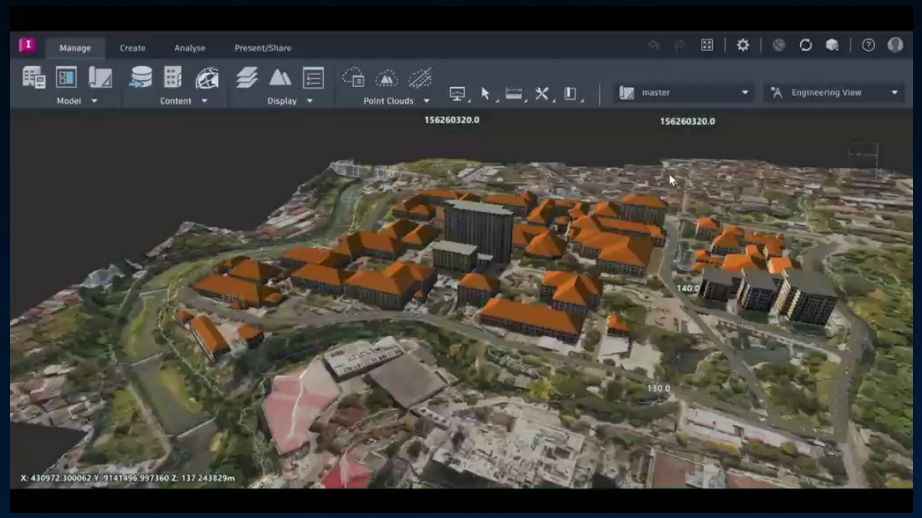

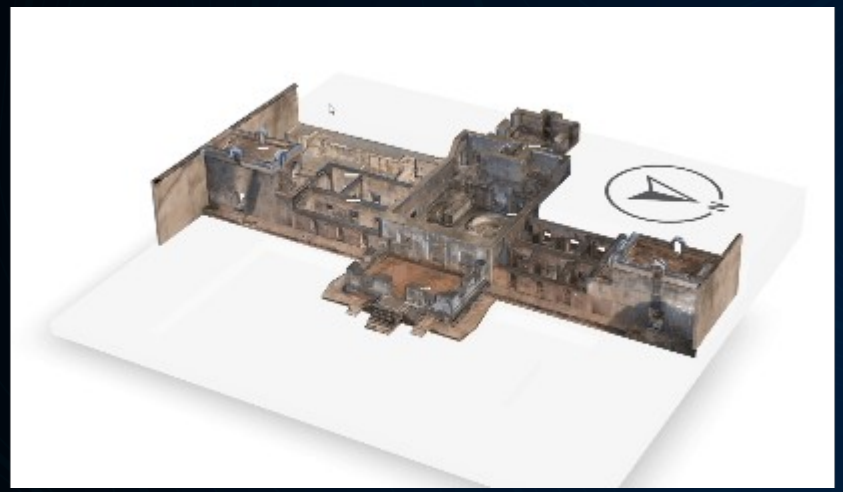





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Big Vision

From Land Data to Spatial Sovereignty

Trusted Land Systems Create Trusted Societies

3,234 agrarian conflicts in 10 years. 1.8 million households affected. Every parcel with a verified digital identity, rights confirmed, value known, use governed, is a conflict prevented.

Indonesia as a Global Proof-of-Concept

If the Digital Twin land governance model works at Indonesia's scale - 1.9M km², 17,000 islands, 126M parcels, it can be replicated for any developing nation facing the same structural challenges.

An Open Invitation to Build Together

Every phase of this roadmap is an entry point. We seek partners with technology depth, international experience, and conviction that land governance is foundational to prosperity and justice.



"Land is the most fundamental asset of a nation.
Managing it wisely is the starting point of all good governance."

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Trusted land systems create trusted societies.

Data Sources

GKI Readiness Index 2025 (Geospatial World) · ATR/BPN, Maret 2025 · KPA Catatan Akhir Tahun 2024 (Feb 2025) · KPA via Tempo, Sept 2025 · Mongabay Feb & Mar 2025 · World Bank ILASP Project (Sept 2024) · PMK No. 85/2024 (Kemenkeu) · Oxford Insights Government AI Readiness Index 2023 · Journal of Human Rights, Culture and Legal System 2025 · Indonesia Law Review 2024 · Astute Analytica via Hexagon 2025 · SLA/GovTech, Virtual Singapore

Thank You

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