XXVII FIG CONGRESS
11–15 SEPTEMBER 2022
Warsaw, Poland

Volunteering for the future – Geospatial excellence for a better living

Digital Transformation of Land Administration

Stages, Status, and Solutions

Rohan BENNETT, **Australia**

Suren TOVMASYAN, **Armenia**

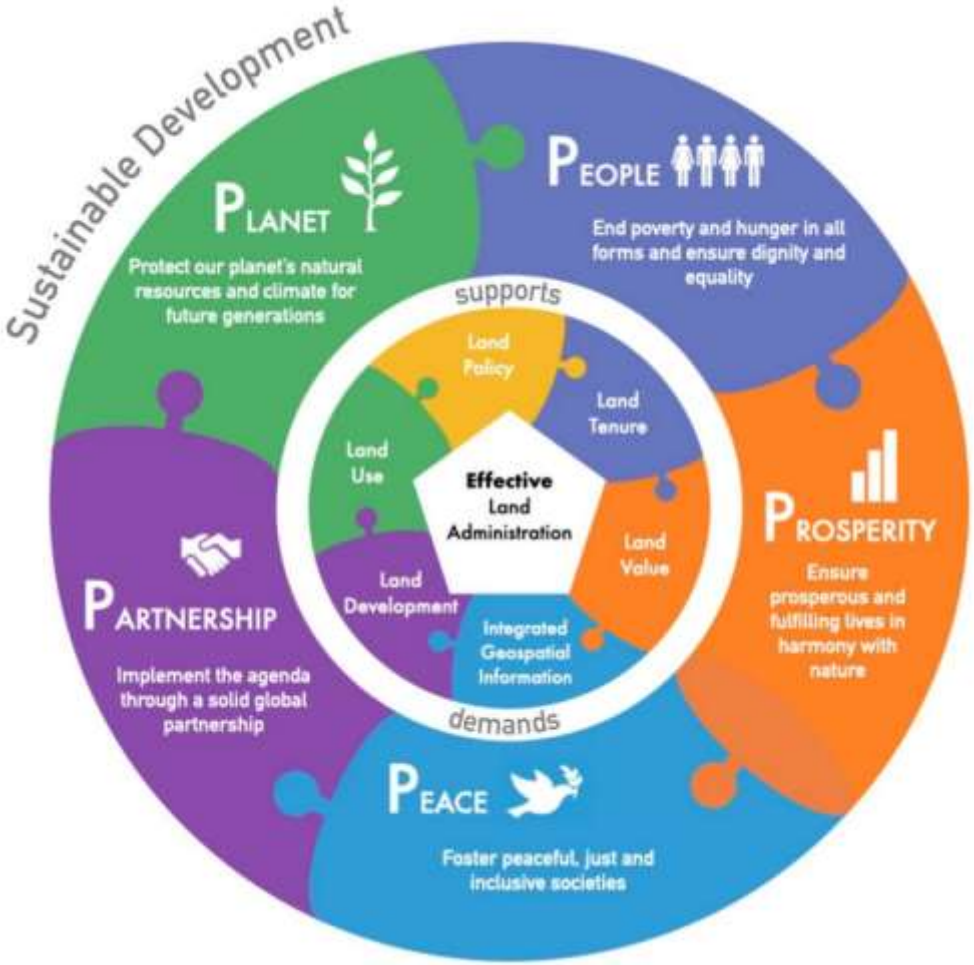
Indra HUTABARAT, Clava PATRAMA PUTRA GINTING, Aulia LATIF, **Indonesia**

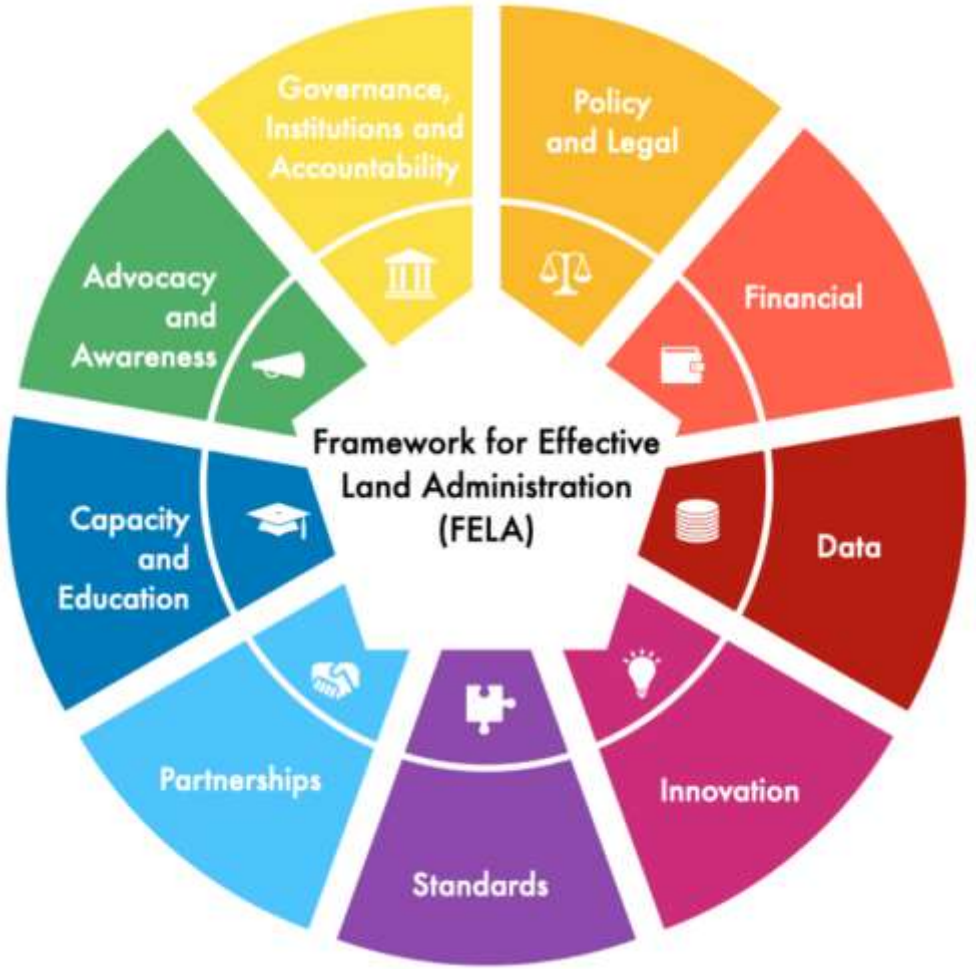
Eva-Maria UNGER, **Austria**

Vincent VERHEIJ and Haico van der VEGT, **The Netherlands**

ORGANISED BY FIG SGP

PLATINUM SPONSORS esri Trimble.


Sustainable Development
PLANET
Protect our planet's natural resources and climate for future generations
PEOPLE
End poverty and hunger in all forms and ensure dignity and equality
PROSPERITY
Ensure prosperous and fulfilling lives in harmony with nature
PEACE
Foster peaceful, just and inclusive societies
PARTNERSHIP
Implement the agenda through a solid global partnership
supports
demands
Land Policy
Land Tenure
Land Value
Integrated Geospatial Information
Land Development
Land Use
Effective Land Administration


Governance, Institutions and Accountability
Policy and Legal
Financial
Data
Innovation
Standards
Partnerships
Capacity and Education
Advocacy and Awareness
Framework for Effective Land Administration (FELA)

Armenia

- **2.9 M** population
- **Cadastre Committee**
- **2.4 M** cadastral ‘cases’
- **123 M** individual pages
- **4** territorial subdivisions
- **5** year digital transformation plan

BOX 5

FELA in action – an example of its application in digitizing archives

IGIF and FELA ensure a holistic perspective on LAS digital transformation. For example, a country-level digital policy priority may envisage removing all paper-based services to reduce corruption. For LAS, this requires converting paper archives into digital records while FELA and IGIF ensure the required broad range of questions are answered.

KEY QUESTIONS TO CONSIDER

Governance and institutions

Who governs the digitization process? Which agency is responsible for the new digital archive? Where will it be housed? Who is responsible for the old paper-based archive and its storage? How will accountability be guaranteed?

Policy and legal

Which records need to be scanned, only contemporary ones or all historical records? Can the old paper records be destroyed or archived for a limited time period? Does digitalization require legislative changes to ensure the new digital archive is legal? Are digital records or paper documents the legal point of truth? What happens if there are discrepancies between paper and digital records? What is the impact on other land administration laws?

Financial

How will the archive digitization be funded and sustained? What is the size and scale of the investment needed? What is the long-term business model? Does storage of the old paper archive also need sustainable financing?

Data

How will the data be captured? How much will be created? How will data be organized and stored? What about the underlying data model? What are the data quality requirements? What does this mean for scanner and technology specifications? How will the data be disseminated and shared?

Innovation

Which technologies are most relevant to complete the digitization? Are optical character recognition (OCR) or intelligent character recognition (ICR) relevant here? How will the archive be future proofed against obsolescence from new technologies?

Standards

Which national and international standards will be used to preserve the old paper archive and create and maintain the new digital archive? Which data formats will be used? How will the process ensure interoperability with national spatial data infrastructures (NSDI) standards? What are the security and risk management standards?

Partnerships

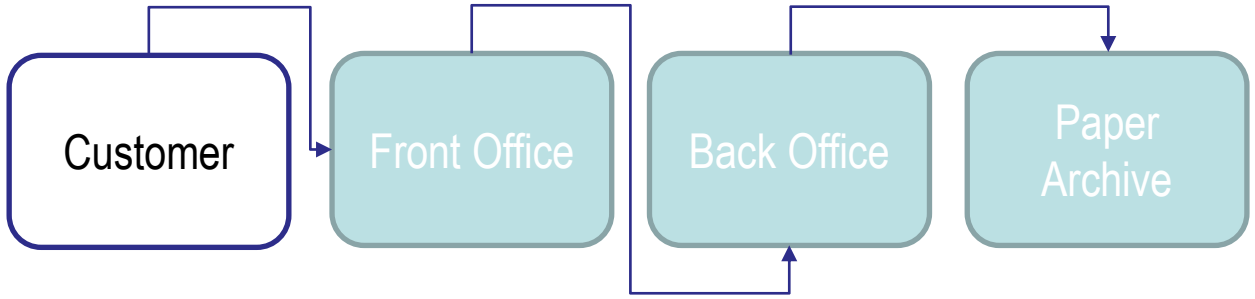
Will external donors support creation of the digital archive? Will it be available to the private sector or academia? What are the baseline service level agreement (SLA) requirements? Will external partners have access to the archive to create value-added services?

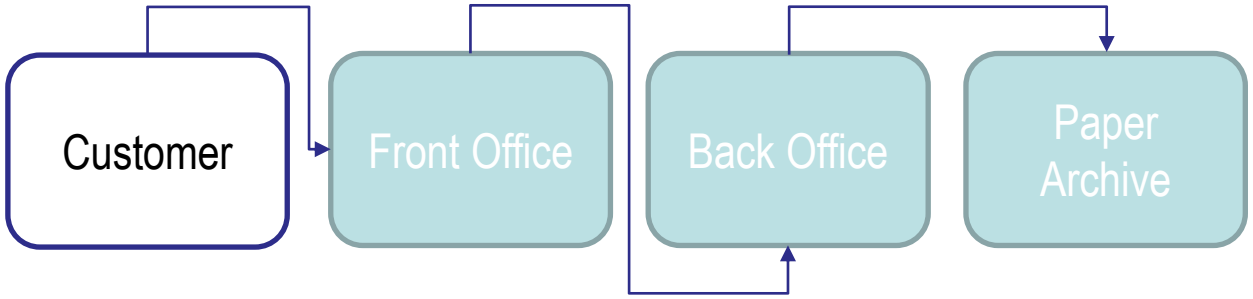
Capacity and education

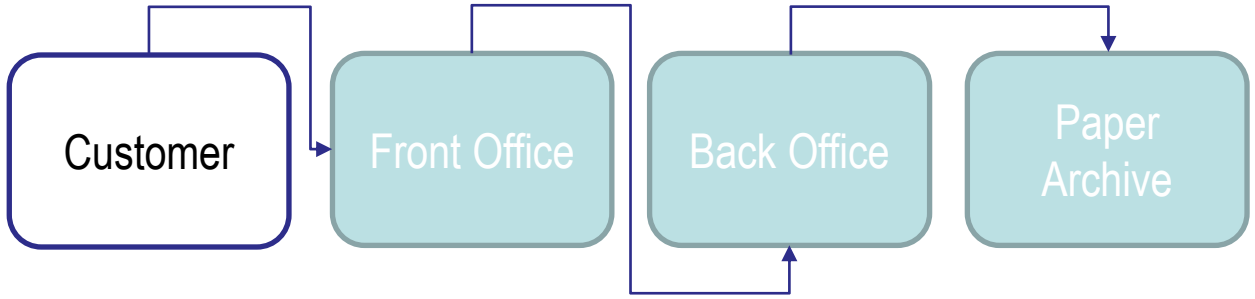
How many people are needed for the initial archive digitization and ongoing maintenance of both the paper and digital archive? Which skillsets are required? What kind of training and upskilling are needed, including private sector actors (e.g. notaries)? Who can provide these?

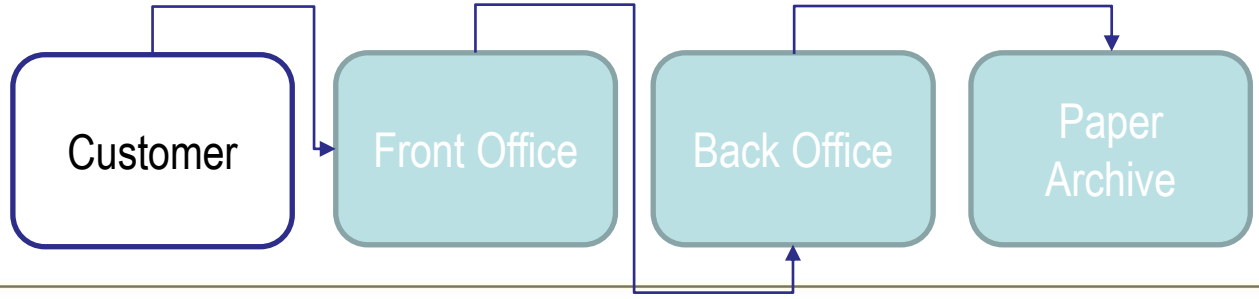
Communication and engagement

Can citizens participate and contribute to the system design? How will the new archive be introduced and explained to staff and external stakeholders? Are awareness campaigns and specific resources needed?


Customer
Front Office
Back Office
Paper Archive

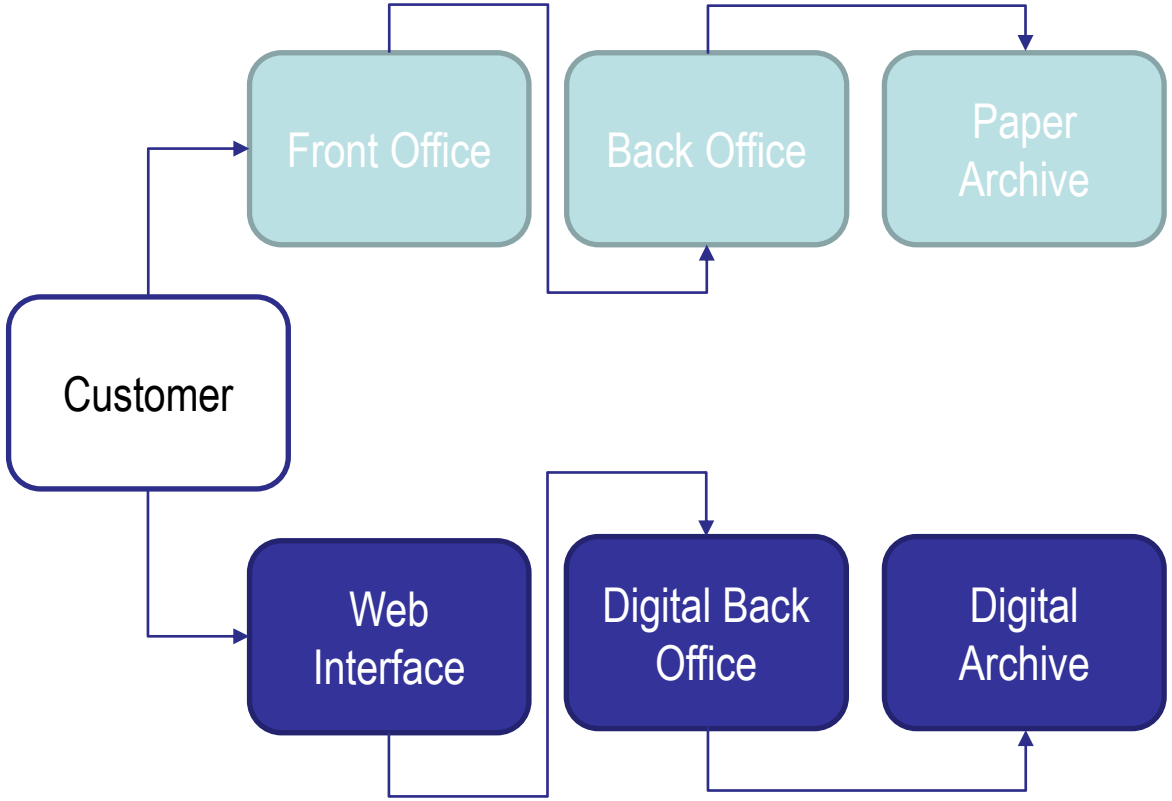

Customer
Front Office
Back Office
Paper Archive


Customer
Front Office
Back Office
Paper Archive

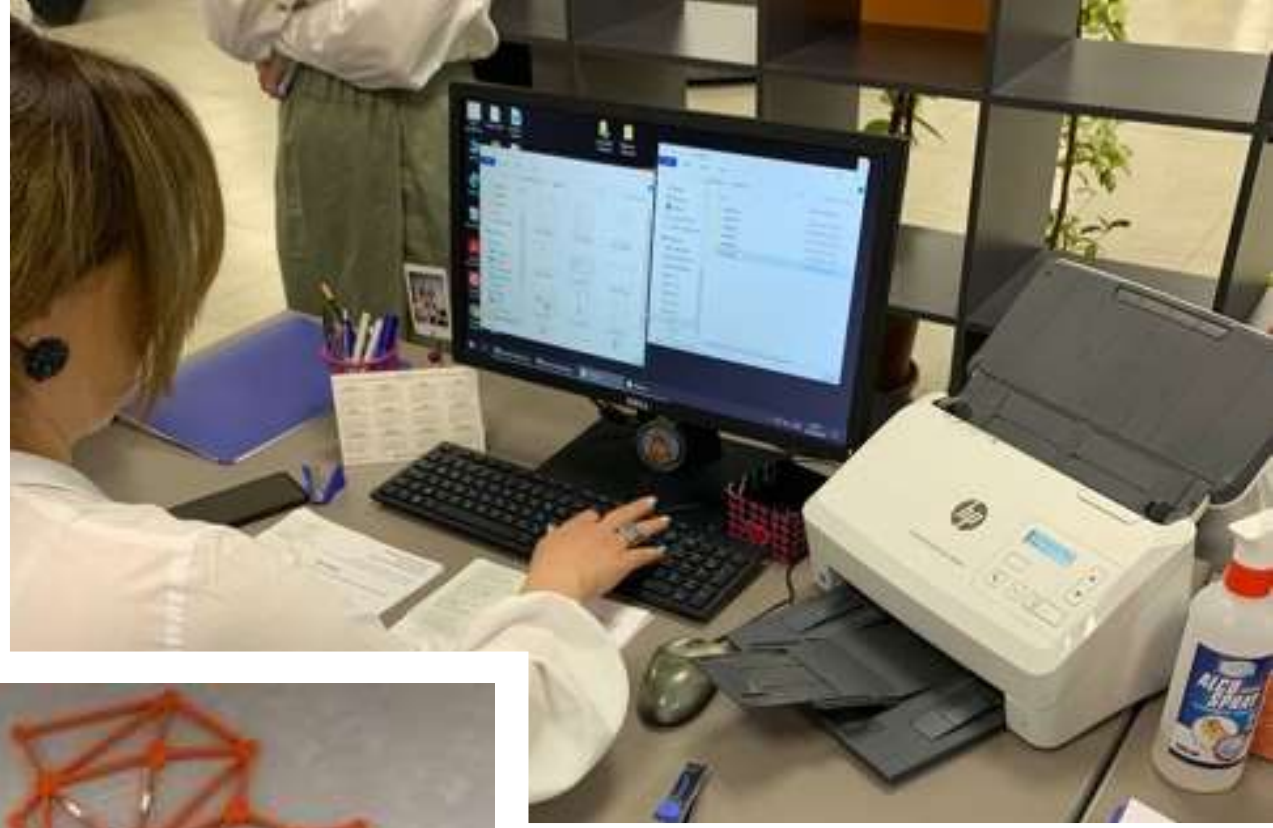

Customer
Front Office
Back Office
Paper Archive

Scenario 1

Parallel Systems (2021~2024)



- Paper archive digitization
- **Paper archive storage and maintenance**
- Digital identities
- **Differences between digital and paper**
- Financing two systems
- **Data Quality** (40K disputes)

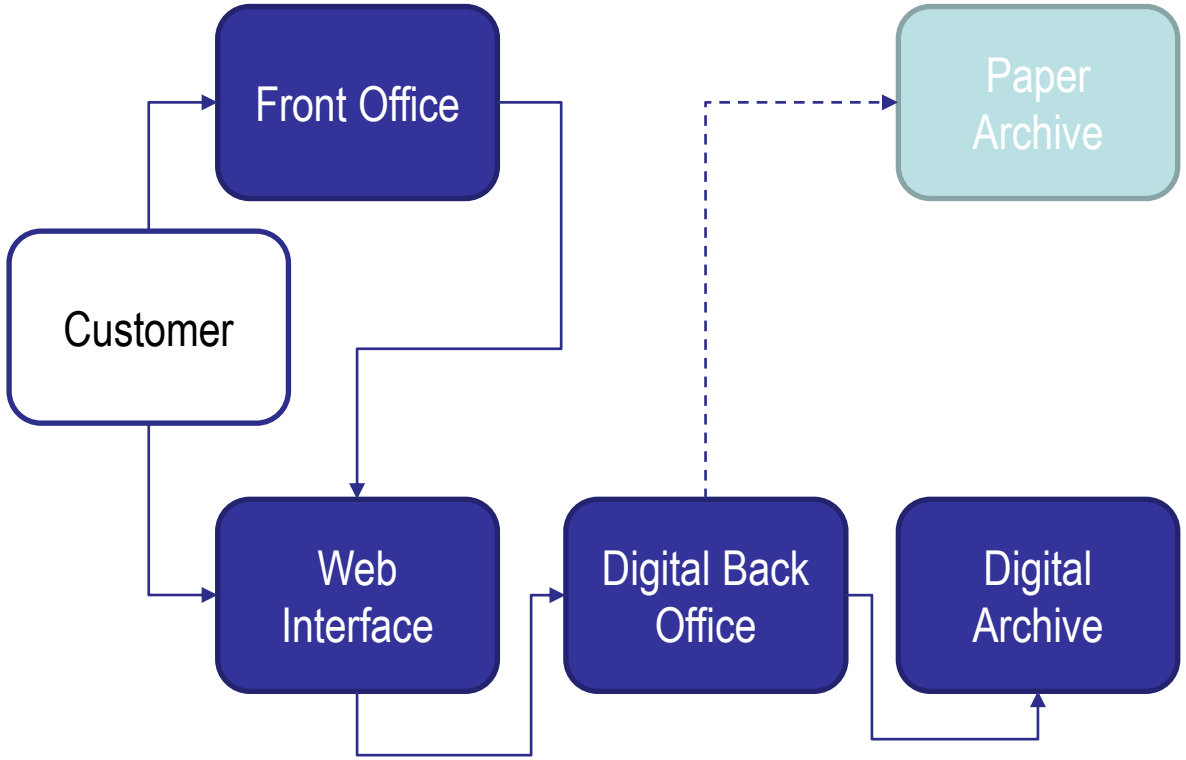



Կադաստրի
կոմիտե

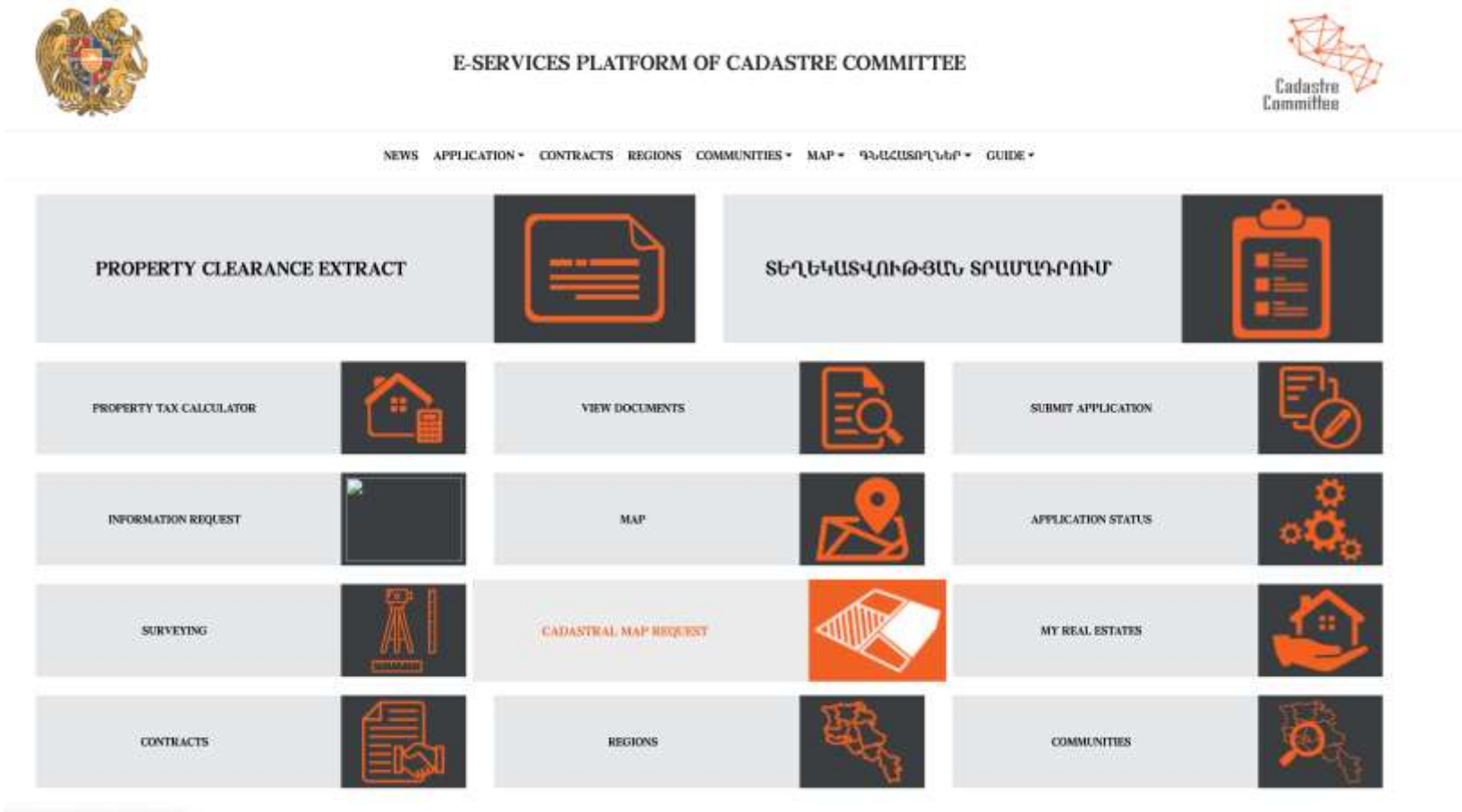

20

Scenario 2

Fully Digital (~2030)



- Legal changes needed
- **Digital standards (data and processes)**
- Retirement of paper system
- **Citizen awareness**
- Leveraging off the data (sharing and exchanging)
- **Partnering with other agencies**
- Training and capacity (IT)


E-SERVICES PLATFORM OF CADASTRE COMMITTEE
Cadastre Committee
NEWS
APPLICATION
CONTRACTS
REGIONS
COMMUNITIES
MAP
ԳՆԱՀԱՏՈՒՄՆԵՐ
GUIDE
PROPERTY CLEARANCE EXTRACT
ՏԵՂԵԿԱՏՎՈՒԹՅԱՆ ՏՐԱՄԱԴՐՈՒՄ
PROPERTY TAX CALCULATOR
VIEW DOCUMENTS
SUBMIT APPLICATION
INFORMATION REQUEST
MAP
APPLICATION STATUS
SURVEYING
CADASTRAL MAP REQUEST
MY REAL ESTATES
CONTRACTS
REGIONS
COMMUNITIES

Indonesia

200 M Population

126 M Parcels

ATR/BPN

OneMap Program + Project

+450 Local Land Offices

1 National Data Centre

5000 transactions / **30** min

Paper → Digital

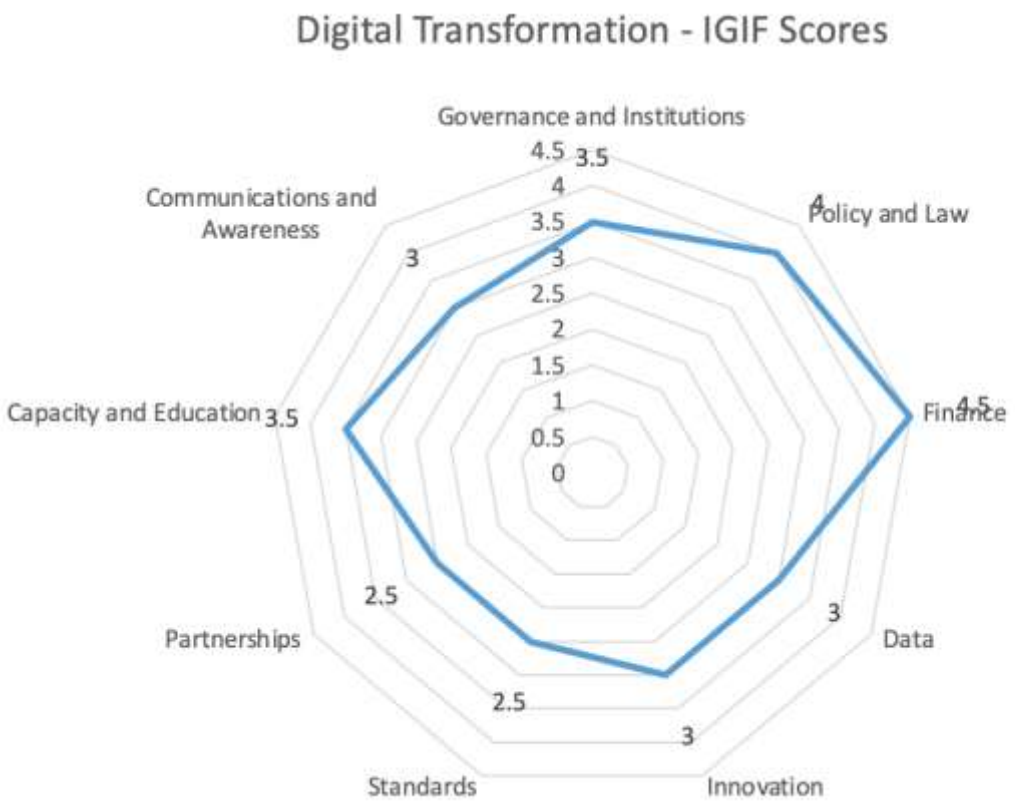
Digitize | Digitalize | Transform

Cadastre, Land Registry and Mapping Agency
Kadaster International

Improving Modern Land Registration in Indonesia
IMLRI

Result 1.3
Digital Transformation State-of-Play and Forwarding Strategy

DRAFT



Pathway	Opportunities and Challenges
Governance, Institutions and Accountability	Vision for ATR/BPN digital transformation that is holistic Digital transformation champions at multiple levels Alignment of digital strategies withi ATR/BPN and with external stakeholders
Law and Policy	Legislative and regulatory harmonisation Assessment of a positive system of land registration Ensuring workable, enforceable, and are adequately resourced law
Finance	Sustainable business model post-2025 Government business enterprise model exploration Audit and assessment of PPP service models Performance metrics redesign around benefits realisation and SDGs
Data	Vision for data governance across ATR/BPN, post-2025 R&D audit and review on cadastral and land registration data Fast-tracking mapping 126M parcels by 2025 (keep going!) Developing and implementing better quality assurance standards Ensuring a robust federated database infrastructure is developed
Innovation	Formalised innovation bench making program across ATR/BPN Incentive schemes at all levels Formalise R&D collaborations across sector Digital divide audit
Standards	Audit governance of standards in ATR/BPN Assess range of technology and data initiatives in terms good practices Development of both internal and industry-wide certification protocols Fostering of a community of practice to support awareness raising
Partnerships	Reviewing partnership and establishment new partnership ecosystem (NGOs) Assess PR 38/2015 with regards to land sector PPPs PaLaR (i.e., FFPLA) review on embeddedness into PTSL Donor-working group creation for optimisation
Capacity and Education	Plan for keeping capacity in ATR/BPN Fast-tracking skill areas for maintaining the data Support professional bodies and encourage self-accreditation
Communications and Awareness	Revisit key stakeholder lists and related communications plans Ensure World Bank project comms are institutionalised Examining the current monitoring and evaluation mechanisms

SWOT Strategies

Strength-Opportunity Strategies

- 3D cadastre: Use financial capacity strength to fund R&D on 3D cadastre
- Fund Engagement of LADM 2.0: Use internal capacity around LADM and funding capacity to engage and further develop ISO 19152 LADM
- Bridge spatial planning and land registration and so strengthen collaboration and partnerships with other ministries

Strength-Threat Strategies

- Fund review of digital transformation, land registration and digital divide
- Use ending WB project to trigger processes to develop a sustainable business model.
- Fund campaign for further awareness raising in regions
- Fund staff internal training and development program

Weakness-Opportunity Strategies

- Use Engagement on LADM and 3D cadastre internationally to develop local standards
- Fund data quality audit and standards devleopment
- Embed PaLaR standards into PTSL to support DT
- Use PPPs focus of central Government to support wide partnership agenda

Weakness-Threat Strategies

- Use partnerships to improve land registration digital divide understandings
- Use the digital divide issue to Lobby for improved funding and external perceptions

Thanks for your time.

The authors would like to thank colleagues at:
Kadaster Netherlands
Cadastre Committee Armenia, and
ATR/BPN Indonesia