

The 6th Land Administration Domain Model (LADM) Workshop

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LADM, possible standardization beyond the conceptual model?

Blockchain and ledger technologies (ISO/TC 307) for effective land administration

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Structure of Presentation

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- **Cadastre 4.0 and fintech 4.0**
- **Blockchain in Land Administration**
- **Standards in Blockchain and priority**
- **Block chain Hacks - Need for ISO**
- **TC307 and TC211**
- **Conclusion and Reference**



TLF Tech
Trade Land Finance Tech

Introduction



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**"Comparative Study of Land Administration Systems",
the World Bank (2003)**

Reviewed land titling and registration options

-Characteristics

- Accessibility

- Costs, and

- Sustainability

**based on information compiled in a number of case study
countries.**

What Could be the Fourth Generation?

- Completion of land titling/Cadastre using new technologies and adopting fit for purpose to compress time of completion from 10-20 years to 3-5 years
- Directly collect data in digital format
- PPP (Private Public Partnership) not only in cadastre construction/issuance of titles, but, in management of registry offices
- Integration of land data with other important data (zoning, taxation, financial sector, market research, utilities and development of smart cities, as part of E-Government programs.



Property Markets | 2



TLF Tech

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Introduction



Case study : Lebanon

Component A: Modernization of the digital Land Registry and Cadastre system, 15 million USD

Component B: National Spatial Data Infrastructure, 8 million USD.

Component C: Property Valuation and Taxation 12 million USD

Component D: State Land Inventory and Management, 10 million USD.

Borrower/Client/Recipient: Ministry of Finance

Source : The World Bank Land Administration System Modernization (P159692)

Cadastre 4.0



Cadastre 4.0 as a paradigm ::

- will close the circle between new technologies and automatization of processes, products and services and stakeholders, including citizen and landowners as essential partners at equal level;
- support partnership model building coalitions /symbiosis between professionals in private and public service, between citizen and users and public authorities and between technology and society;
- sets the scene for permanent communication between people, procedures and products by amending internet of things by a social aspect;
- encourage citizen engagement and greater transparency and accountability to generate more trust and support for the cadastral system;
- truly 5D and above, defined as the spatio-temporal unit against which (one or more) unique and homogeneous rights (e.g. ownership right or land use right), responsibilities or restrictions are associated to the whole entity, as included in a Land Administration system.

Case study - Ghana

- **Almost 90% of rural land in Ghana is not recorded in an official database, and many city dwellers have not yet official address..**
- **A symbiotic approach to building a cadastral register and property register for the people and made by the people.**

**-reducing human corruption in land disputes
-transparency
-wealth distribution to entire communities and property rights**

futuristic paradigm of Cadastre 4.0



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Case study - Georgia

In April 2016, the National Agency of Public Registry and the company specializes in BitFury bitcoin

- **directly and officially by the government.**

Goal : enable citizens to register their property on blockchain.

**Objective :
global transparency of the titles rights of the property cannot be misrepresented.**

Cadastre 4.0 - Fintech

The first phase actually overlaps with Cadastre 3.0 stage

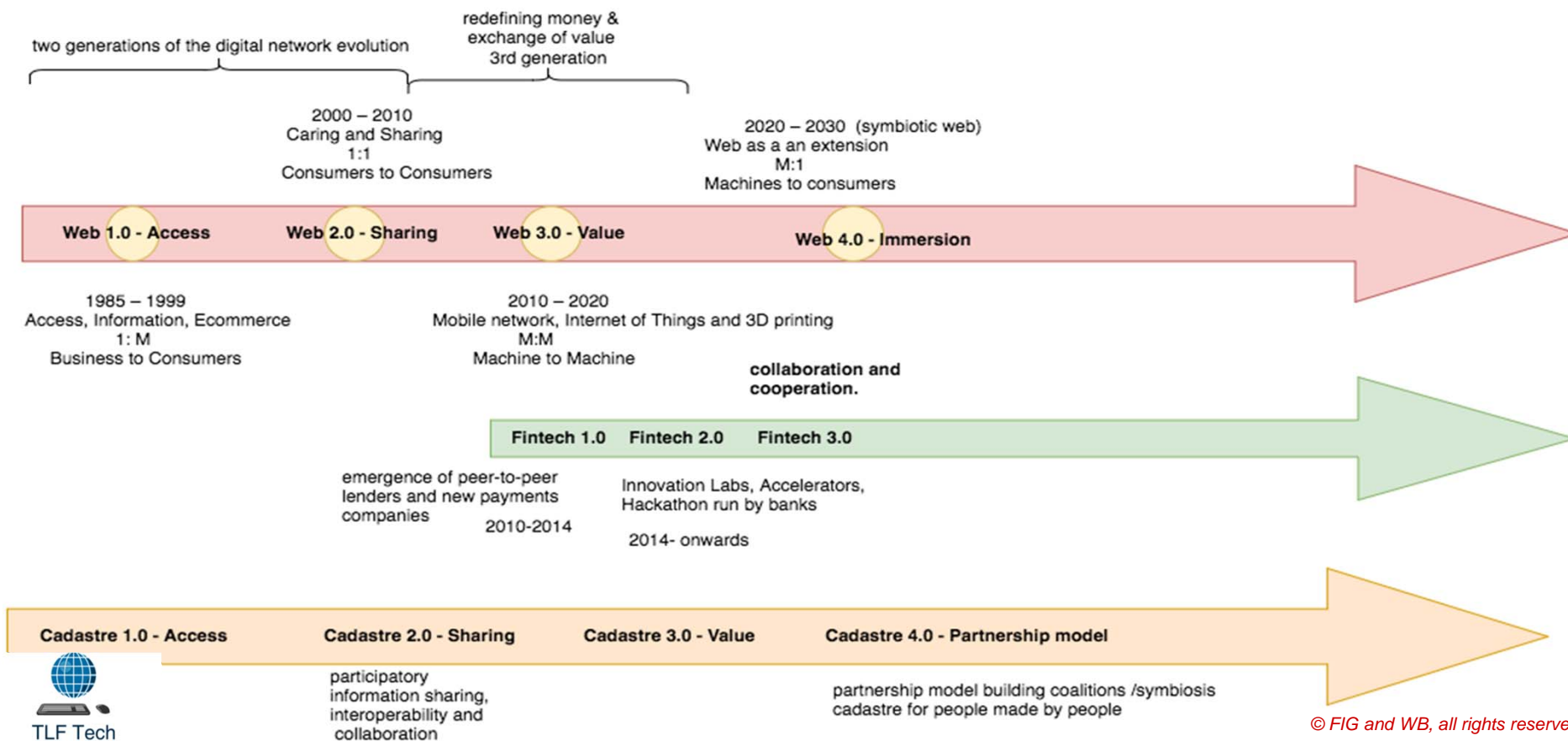
- First wave directly has only started creating the stage for a disruption even in real estate management practices
- “Second Wave”: incumbent players created leverage on business models through their existing expertise, innovation centers to remain competitive amongst startups while leveraging their established brands and infrastructure and by fostering on the cultural mentality of fin-tech startups .
- Third wave Fin-tech 3.0 will aggressively use blockchain to distribute digital data globally,

So the Cadastre 4.0 will leverage on such distributed ledger systems. It also uses Internet of things to enable a value chain defined by effective use of data.



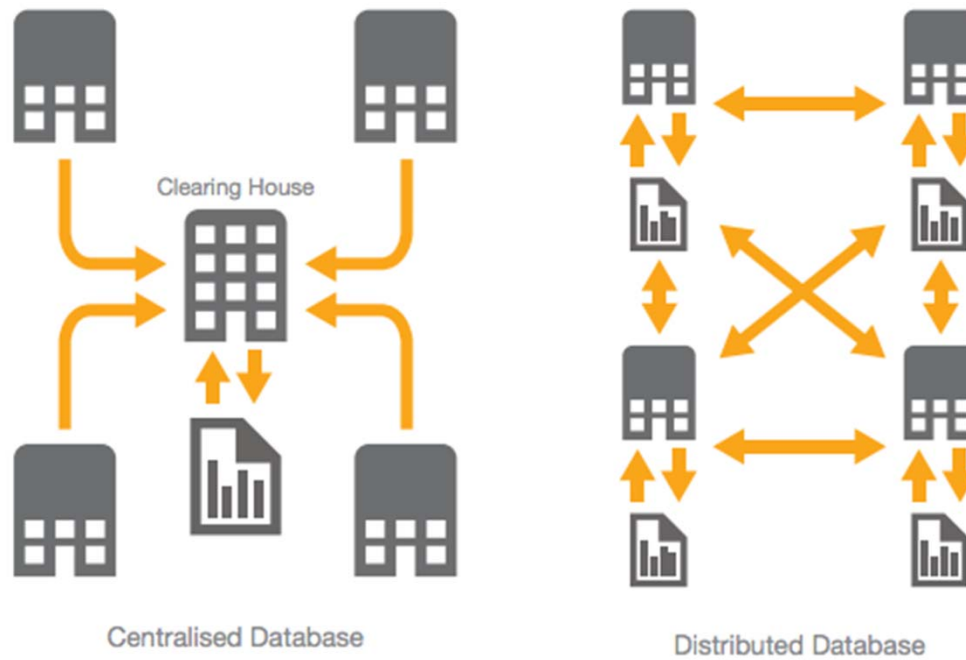
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Land reforms and Fintech

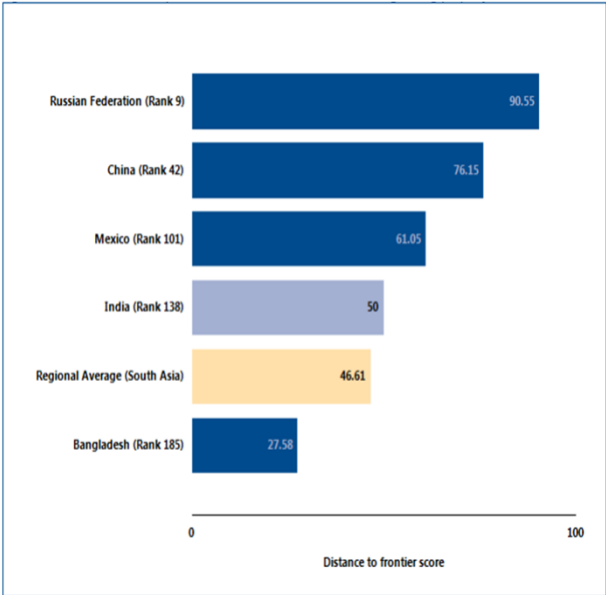
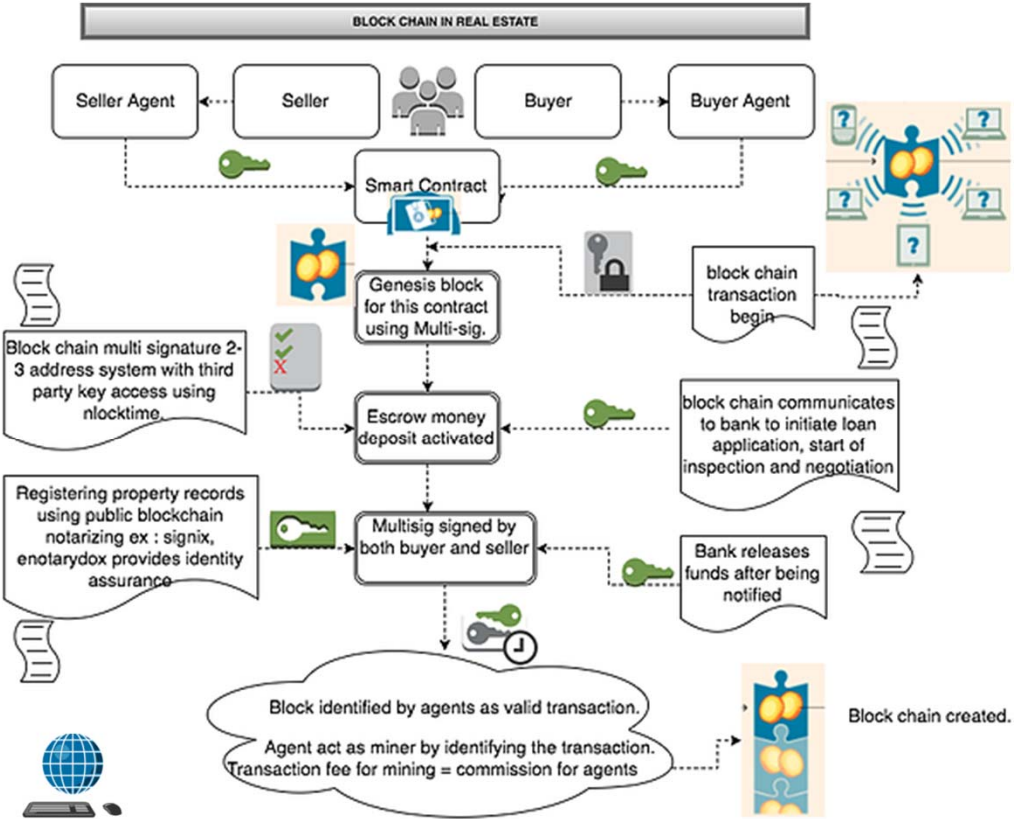


Why Blockchain?

How blockchains, with a distributed database, eliminate the need for third parties among entities



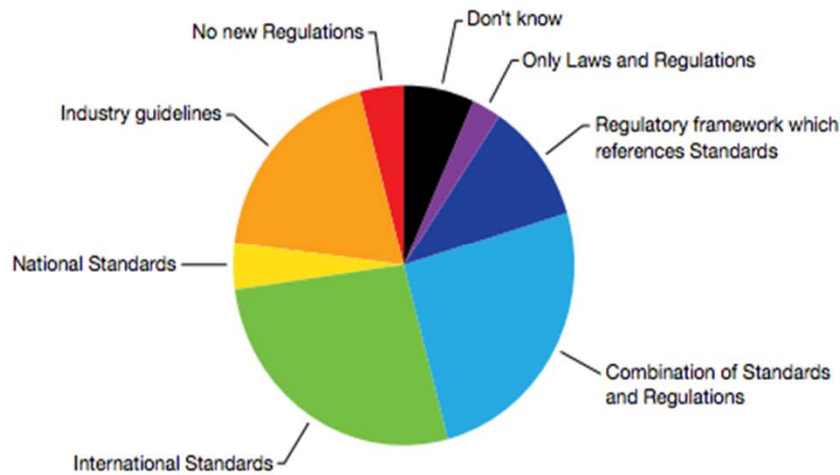
Blockchain in Land registration



Source: Doing Business database.

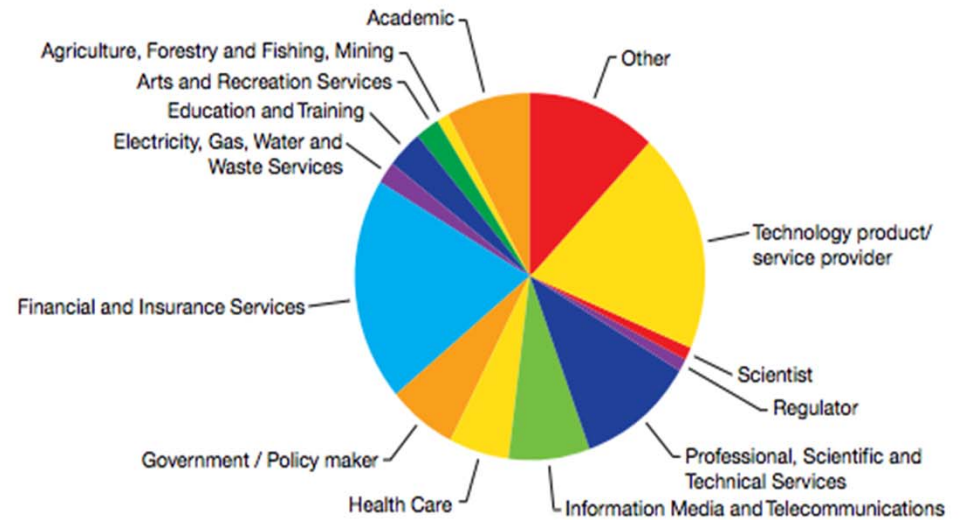
Survey on Standards for Blockchain

The optimum standards and regulatory framework to ensure we are fostering innovation and entrepreneurship



More than 88% of respondents indicate a role for standards in supporting the roll out of blockchain technologies. Source: Blockchain survey, Standards Australia analysis

Respondents by sector of economic activity



Source: Blockchain survey, Standards Australia analysis

Liaison committees

Liaison Committees to ISO/TC 307

The committees below can access the documents of ISO/TC 307 :

| Reference | Title | ISO/IEC |
|---------------------------------|---|---------|
| ISO/IEC JTC 1 | Information technology | ISO/IEC |
| ISO/TC 154 | Processes, data elements and documents in commerce, industry and administration | ISO |
| ISO/TC 184/SC 4 | Industrial data | ISO |
| ISO/TC 292 | Security and resilience | ISO |

Organizations in liaison

|  TLF Tech | Title | Liaison type |
|---|---|--------------|
| | Society for Worldwide Interbank Financial Telecommunication | A |

Priority standards for Blockchain

The priority order for standards development activities relating to blockchain according to respondents of the survey:

- 1. Need for consistent and agreed terminology**
- 2. Privacy**
- 3. Governance**
- 4. Interoperability**
- 5. Security**
- 6. Risk**

Secretariat Australia - Standards Australia (SA)

Participating Members (17)

Observing Members (16)

<https://www.iso.org/committee/6266604.html?view=participation>

Blockchain technologies to efficiency

Government services that survey respondents would like to see using blockchain technologies to improve efficiencies and public access

| | |
|---|-------|
| Land Transfers and Property Title registrations | 72.1% |
| Personal Identification and Passport Documentation | 68.9% |
| Management of Health Records | 65.6% |
| Vehicle Registrations | 54.1% |
| Welfare Distribution and Monitoring | 37.7% |
| Urban planning; wider pedestrian sidewalks, increased times for crossings | 21.3% |
| Public Transport Scheduling | 16.4% |

Source: Blockchain survey, Standards Australia analysis

TC 307 and TC 211



September 2016 - ISO announced that Australia will manage the Secretariat of ISO/TC 307
International Organization for Standardization (ISO) approved Standards Australia's proposal

The ISO 19152:2012 Land Administration Domain Model (LADM), as an international land administration standard focuses on legal requirements, but considers out of scope specifications of external information systems including valuation and taxation databases

Possible joint working group under FIG Commission 7 (Cadastre and Land Management) and FIG Commission 9 (Valuation and the Management of Real Estate) in collaboration with other relevant international bodies.

There has been no contact between the two committees, ISO/TC 211 and ISO/TC 307, in the period where Standards Norway had the TC 211 secretariat

a list of names has been forwarded to the ISO/TC 307 with our agenda to the committee secretary liaison team



Conclusions and further research

Challenge : transferring online functionality to physical world

Industry standards are also a concern

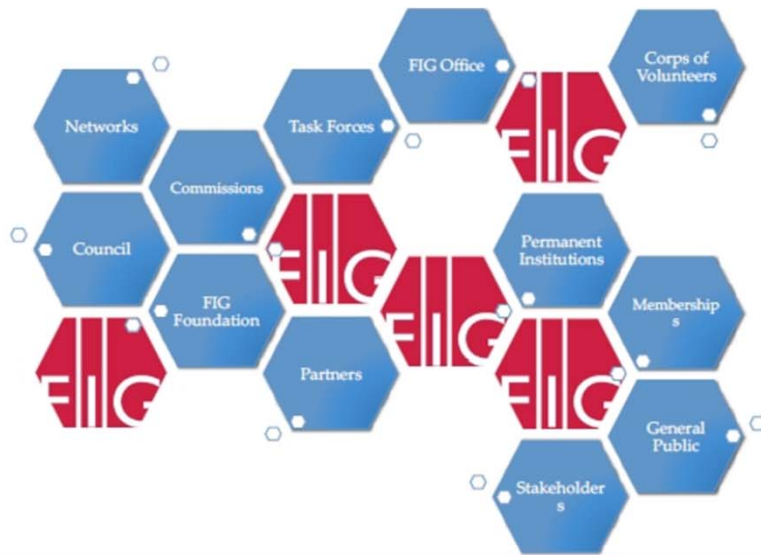
Security standards of the technology may be questionable

Privacy - *act of user providing personal data to cadastral engine*

References

- *ROADMAP FOR BLOCKCHAIN STANDARDS Report – March 2017*
- *Varant Meguerditchian, Australia : Blockchain & Electronic Distributed Ledger Technologies New Field of Technical Activity*
- *Manohar velpuri, Denmark : Cadastre 4.0 as a paradigm towards a Fin-tech enabled Real estate management, FIG commission 7 annual meeting 2016 on Geoconference on Cadastre 4.0, Coimbra Portugal.*
- *Manohar Velpuri, Denmark & Anusha Pidugu (India) : Big Data for Disaster Management and Real estate Management in Smart Cities (7987), FIG Working week 2016, New Zealand*
- *Manohar Velpuri, Anusha Pidugu, Maringanti Chetan, Aman Sharma Madhu: Developing Sustainable Financing to Encourage Private Investment through Block Chain and CrowdFunding in Real Estate, High-Level Joint FIG / World Bank Conference Sustainable Real Estate Markets Policy Framework and Necessary Reforms 19 & 20 September 2016, Greece*

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- International Association of Geodesy (IAG)
- International Cartographic Association (ICA)
- International Federation of Surveyors (FIG)
- International Geographical Union (IGU)
- International Hydrographic Organization (IHO)
- International Map Industry Association (IMIA)
- International Society of Photogrammetry and Remote Sensing (ISPRS)
- International Steering Committee for Global Mapping (ISCGM)

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- **The European Group of Valuers' Associations, TEGoVA**
- **The African Real Estate Society, AfRES**
- **Asociación Panamericana de Profesionales de la Agrimensura, APPA**



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