Title: **RE-OS: Towards an Interoperability Architecture for Real Estate**

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Executive Summary

The Real Estate Industry has an interoperability challenge: Building design, construction, lease, use, adaptation, operation, financing and reuse generate millions of decisions, rely on still more millions of property specific and market conditions, laws and regulations, and determine still more millions of facts, inferences and decisions used by real estate investors, lenders, insurers, tenants and regulators.

Up through the Industrial Age, analog processing of such decisions, facts, conditions, laws and inferences was professionalized such that architects, contractors, developers, engineers, subcontractor trades, tenants, owner/occupants, property managers, lawyers, brokers, regulators, taxing and land use authorities, bankers, insurers and others recorded on paper the rules for making decisions, their decisions and summaries of their decisions (think about building, tax or zoning codes and filings, or deed, mortgage and security interest registries). With the Digital Age, such analog processes, while justifiable in history, have grown complexity and frustrate collaborative advantages. Worse, the legacy of decisions, their rationale, and how to use them to adapt the built environment innovatively has been lost in the morass of paper filings, a maze of places to look for them, and the rights and duties to see or change them.

This paper proposes a sharable digital information operating system for the built environment, interoperable across all stakeholders needing access to reading or writing decisions that real estate professionals generate or rely upon. A key feature of this architecture is that it becomes a language platform for building in computer code the next generation applications that the Digital Age requires to serve the needs of all parties having a legitimate interest in what is built where, why, how and to what effect.

Outline for this paper:

1. **Where we are**
    a. How is real estate designed, built, financed, operated, used and adapted today?
    b. The risk and waste of digitizing analog processes without reinventing them
    c. Examples of maladaptive real estate technology risk: Cyber risk of LAN connections for "smart buildings" (Target hack), separate identity management and permissioning of building systems (HVAC, entry/exit, emergency response)
2. **Looking for inspirations** - Interoperability advances in other industries such as geospatial technologies, semiconductors, aircraft, medicine, finance
3. **Block Diagram** of the Information Flows for the Real Estate Industry
4. **Semantics and Ethnography of Real Estate** – How specialized knowledge is encoded, captured and transmitted to its users
5. **Blockchain and distributed ledgers** – Advances in secure, decentralized fact and transaction processing will democratize how we store, find and use information
6. **Real Estate Technology (RE-Tech)** startups and investors need wrap-around information architecture before their build apps to nowhere – Visualization, data analytics, crowd-knowledge, sustainability advantages.
7. **Goals for Basic Design of RE-OS** – leveraging semantics of existing professionals, interoperating with their existing data sources, transforming the dashboards to better see the whole picture, reducing the real estate boom and bust cycle by speeding informed, collaborative decision-making, improving regulatory safety and compliance, reducing financing and insurance costs and risks
8. **Proposed Design for RE-OS (Version 1.0)**
9. **Proposed Interoperability Consortium to sponsor and steward development of RE-OS**