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# Decentralized Autonomous Housing

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## Abstract

Autonomous Organizations offer to disrupt all existing business models, from Derivatives Trading to Real Estate Procurement. This presents a unique opportunity for architects and urban designers to reshape the built environment by collectively taking control from Developers and Investment Companies which have little interest in the quality of the built environment.

The difficulty of development control in architecture and urban design resides in their dependence on a client body and their inability to control the necessary financial resource for Real Estate. By rethinking the syndicalist approach of the now defunct International Congress for Modern Architecture (CIAM), and drawing on applications developed on the Ethereum blockchain<sup>1</sup>, this proposal seeks to provide a justification and road map for Smart Contracts in housing procurement from the perspective of the architect-urbanist Real Estate developer, and a structure for collaboration and resourcing real world projects through academic research and innovative business practice.

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<sup>1</sup> Tapscott D. Tapscott A. Blockchain Revolution. How the Technology behind Bitcoin is Changing Money, Business and the World. 2016, pp.115-117; see Figure 2

## Speculative Urbanism

Architects and urbanists have been speculating the implications of the internet and extended communications since the mid-90s, with predictions as early as William J. Mitchell's ME++, and City of Bits; and MVRDV's Metacity/Datatown. Mitchell had predicted primitive forms of connected devices and even smart keys/locks, similar to apps being developed by Airbnb as evolved forms of urban connectivity; while MVRDV on their part had predicted the future of the ledger/spread sheet and statistical methodologies as Big Data in the anticipation of housing and urban intervention.



Figure 1: MVRDV, Sky Village

## Author Keywords

Ethereum, Automatic Markets, Smart Contracts, Decentralized Autonomous Organization, Autonomous Housing, Real Estate Procurement

## ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous;

## Theme, Motivation and Background

This workshop takes the current global socio-economic climate as an opportunity to rethink and advance the cornerstone arguments of CIAM on housing optimization; of which some has already been undertaken by MVRDV through their explorations into maximum density (FARMAX) and data driven urbanization (Metacity/Datatown)<sup>2</sup>

This workshop proposes to investigate the potential for Blockchain in the Real Estate market as a technology to empower architects and urban designers, thereby improving the quality of the built environment.

Inspired by existing applications such as UBITQUITY and COINIFY,<sup>3</sup> the workshop is premised on the hypothesis that the integration of blockchain and distributed ledgers into Real Estate procurement will reduce transaction costs and bureaucratic lag, which will in-turn have a trickledown effect that potentially

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<sup>2</sup> Applications like MVRDV's function mixer is also of importance in this investigation, albeit primitive to our enquiry; see: Maas, W. Farmax: Excursions on Density, 1998, also, MVRDV, Metacity/Datatown, 1999; see Figure 1

<sup>3</sup> Swan, M. Blockchain: Blueprint for a New Economy, 2015

transforms the built environment, particularly as the much of the 'saved' value may then be applied to land development, ultimately increasing the standards of living in cities around the globe, particularly in developing and emerging economies.

If architects and urbanists are to take control of the built environment, we will need to embrace Real Estate procurement. With Blockchain, it becomes possible to create procurement models which allow this distribution of power between architects and urban designers, and the capital market. Real Estate relies on robust procurement logic, particularly in the design and construction phases of property. Nitor and SAP Ariba are currently exploring the blockchain interface as part of their procurement strategy; however, these companies at the forefront of procurement, like developers and investors, have no interest in the quality of the built environment. With Blockchain, architects and urban designers can take adopt the syndicalist mandate began with CIAM without centralized power and the conflict of self-interest which ultimately destroyed it.

The proposed workshop is part of ongoing research into speculative urbanism and autonomous housing, where a Smart Contract may initiate a pre-design procurement procedure which incorporates the various steps in the supply chain of Real Estate development and extends into ownership, insurance and post-occupancy maintenance. A recent article on the disruptive nature of blockchain suggests that traditional procurement is currently under threat<sup>4</sup>, but confirms

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<sup>4</sup> <https://www.forbes.com/sites/sap/2017/04/20/blockchain-will-radically-disrupt-your-supply-chain-4-steps-to-take-now/#2a7831f54c42>; last accessed at 17:40, on 23 April 2017

### Example

In line with our argument on the elimination of transaction costs, Tapscott and Tapscott\* also argue the case that Airbnb lose most of the value/revenue they generate to instruments such as Western Union and foreign exchange markets. Tapscott and Tapscott then developed a distributed app (DApp) on blockchain as a competitor to Airbnb which they called bAirbnb.

bAirbnb operates as a set of Smart Contracts with the functionality of a Real Estate agency, complete with platforms for uploading listings and pictures, review functions and geolocation. In addition, it has near property lock functionalities which sync with mobile devices or wearables, insurance cover and identity verification.

our hypothesis that the elimination of transaction costs including institutional bureaucracy and lag allows for better housing and built environment.



Figure2: Structure of Smart Contract (Market Research and Pre-Design Feasibilities – Post Occupancy Maintenance)

In individual cases, knowledge of a potential buyers or tenants via sharable profiles (e.g. profiles held by amazon, Netflix, etc.), may be processed without being held by central repositories or servers

If the theoretical basis of blockchain is understood, we argue that rent contracts in the residential sector can be reduced to the form of contracts for hotels; likewise, the ownership of the 'operator' can be distributed between a 'commons'; consequently, any subscriber benefits from the elimination of incumbent layers of transaction, and unlike amazon or Netflix, the operator has no knowledge of the subscriber nor access to customer profiles. A similar project has been explored as a blockchain alternative to Airbnb, but this is still based on sharing existing assets not Real Estate development

### Aim

In the 1930s, the International Congress of Modern Architecture (CIAM) proposed what was then a radical framework for housing based on several extraneous factors, including emerging technologies in manufacturing and management, and the burgeoning

avant-garde ideologies from the visual arts. Popular understanding in architecture gives that CIAM and 'Modernism' was an aesthetic agenda; however, beneath the presumed aesthetics is a robust financial and economic framework built on Fordism, Taylorism and pragmatism.<sup>5</sup>

In contemporary architectural practice (including academia), housing is generally considered as the design of housing provision within a legal and built environment framework and neglects the perspectives of Real Estate, Deal Making and Politics. A rethinking of architecture, along the lines of the latter, forms the basis of this proposal. This workshop aims to achieve two things:

1. A justification and road map for Smart Contracts in housing procurement from the perspective of the architect/urbanist-Real Estate developer.
2. A structure for collaboration and resourcing, with real world project, in a bid to structure academic research and innovative business practice.

### Precedents

The Ubitquity platform<sup>6</sup> was founded on September 15, 2015 as a prototype for secure document storage and integration with the title insurance industry and county clerks within the United States; as proof of concept of introducing Blockchain in Real Estate market. Ubitquity is based on bitcoin blockchain, it records every step of Real Estate transaction on a distributed ledger saving

<sup>5</sup> Mumford, E. The CIAM Discourse on Urbanism, 1928-1960, 2002

<sup>6</sup> <https://www.ubitquity.io/site/about.html>; last accessed at 10:02, on 24.04.17

\*See Tapscott and Tapscott, Blockchain Revolution, 2016, pp.115-117

the US approximately \$1bn (£700m) a year by eliminating fraudulent conveyance, and improving overall efficiency and security in sales.

The potential advantage of the Ubiquity platform is in its ability to reduce overall fraud and documentation errors during Real Estate transactions. Banks and companies involved benefit from reductions in title search time of property records, increase confidence in the deeds histories, and process transparency<sup>7</sup>. The platform ensures legal compliance with government regulations in each country. The use of a distributed ledger for real-estate title and deeds records, also allows for open public queries and enhances trust in the system and between all private and public entities involved in any transactions<sup>8</sup>.<sup>4</sup> Ubiquity also provides the capacity for decentralizing large amounts of metadata and attachments using peer-to-peer (P2P) communications protocols like BitTorrent.

Coinify in collaboration with JUST-SOLD is a similar Real Estate procurement platform for facilitated payments; it is amongst the first of its kind using blockchain and bitcoin for payments<sup>9</sup>. It allows transparency and open inquiry on source of funds, using blockchain analytics<sup>10</sup> to track the prospective

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<sup>7</sup><http://infocoin.net/en/2016/07/23/real-estate-platform-uses-ubiquiti-blockchain-for-properties-transferences/>; last accessed at 10:05, on 24.04.17

<sup>8</sup> <http://www.ibtimes.co.uk/ubiquity-using-bitcoin-blockchain-secure-real-estate-titles-1548574>; last accessed at 09:40, on 24.04.17

<sup>9</sup> <https://news.coinify.com/coinify-process-first-nordic-blockchain-currency-real-estate-purchase-just-sold/>; last accessed at 10:00, on 24.04.17

<sup>10</sup> See chainalysis: <https://www.chainalysis.com/>; last accessed at 17:00 on 24 April 2017

buyer's previous wallets and transactions '*in a matter of few clicks*'<sup>11</sup>. There are still latency issues associated with blockchain, but in seeking out competitive platforms for Real Estate transactions this is an issue we will not be presently engaging.

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<sup>11</sup> The lead time for blockchain transactions is still considerably slower in real time, however, its benefits in terms of eliminating bureaucratic lag are unquestionable. See Swan, M. op cit, pp. 83-87

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### List of Figures and Tables

Fig. 1. MRDV, Sky Village: <https://www.mrvd.nl/en/projects/415-rodovre-skyvillage>; last accessed at 17:00 on 25 April 2017