DESIGN & DISRUPTION IN HOUSING

A CASE FOR INEVITABLE MASSIVE CHANGE IN HOUSING IN 35 SLIDES

DAIMAN OTTO, CO-FOUNDER @ TALLWOOD

EDA CONFERENCE, WELLINGTON 21ST MARCH 2018

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SKIN IN THE GAME

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THE GLIMMERS OF CHANGE:

NZ's Housing is 1. Unaffordable, 2. Unhealthy, 3. Poor Quality, 4. Non-inclusive, 5. Unfit for Purpose & hampers societal progress.

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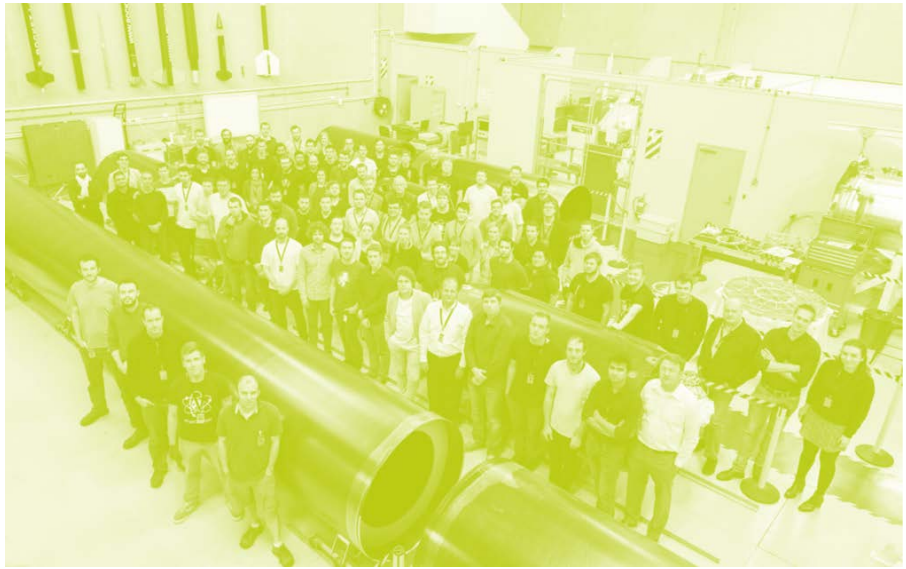
HOLD 2 CONTRARY THOUGHTS AT ONCE:

An Average NZ Space Company:



An Average NZ Building Company:

CLIENT DISSATISFACTION & DISPLEASURE

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Property

Why are Britain's new homes built so badly?

Julia Kollewe

Sat 11 Mar 2017 07.00 GMT

796 | 171

▲ More than half of buyers of newly built homes in England have had major problems. Photograph: Alamy

We compare UK construction standards to those abroad – and talk to buyers deeply disillusioned by their experiences

So how does the construction process in the UK compare with other countries? We found that in Germany and the Netherlands regulations and standards are much stiffer – but in New Zealand, cases of poor quality building appear to be as common as in Britain.

'You have more protection buying a £20 kettle'

A survey conducted by homelessness charity Shelter found homebuyers' satisfaction with the condition of their new homes on moving in has declined by 10%, to 78%, over the past five years. It found 38% experienced more problems than expected, up from 27% in 2012, and 69% reported six or more issues to the builder, up from 56%.

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THE BARRIERS FOR CHANGE:

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BARRIERS TO CHANGE:

LACK OF KNOWLEDGE

Building physics don't apply in New Zealand. Nothing can be known, Nothing can be predicted, Nothing is situated in real space, nothing can be learnt from others. Evidence means nothing.

Lack of examples.

COST VS. VALUE

Operators in New Zealand have a 'spray and walk-away' culture – mistakes paid for by someone else. This is the expectation for people who focus on cost, not value.

Follow the rules.

FRACTALS & MONOLITHS

The industry is a mix of the 1 and 99%er's – a cottage industry with low barriers for entry and exit. Massive incentives for the status quo throughout the industry. Lack of skills, R&D and productivity.

Stasis and Hegemony.

SAFETY IN NUMBERS

Gaining acceptance for above code is not incentivised and fraught with uncertainty – alternative solutions is a territory without a map – a flick of the switch from caution to quality would change everything.

Acceptable to whom?

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DEFINITION: BLACK SWAN

BEFORE = UNPREDICTABLE

The GFC was foretold by some, but not by the vast majority who remained perplexed and shocked as Bear Sterns and Lehman Brothers fell in 2007/8.

AFTER = OBVIOUS

Analysis of the financial records of Freddie Mac, Fannie May and others showed that impending failure was obvious if you paid attention.

+

INEVITABLE

Post-collapse, everything looks simple, understandable and predictable – if only one had paid attention and focused on the fundamentals.

THE EVIDENCE FOR CHANGE:

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EXHIBIT 1: KIWIBUILD

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EXHIBIT 1: KIWIBUILD

A once in a generation opportunity to dramatically re-focus what housing is, how it is delivered and what it can contribute to New Zealand society.

This is a transformational opportunity for the architecture & construction industry requiring off-site manufacture and radically different business models.

- 100,000 houses to be built over 10 years
- An additional 2000 social houses
- Equates to a average of 27.4 houses a day
- Transformational power of scale
- Quality is fundamental

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EXHIBIT 2: VENTURE CAPITAL FLOWS IN

EXHIBIT 2: VENTURE CAPITAL FLOWS IN

The world needs to build more than two billion new homes over the next 80 years.

Construction productivity has no increased in more than 30 years worldwide.

This is a recipe for massive disruption and opportunity.

- Construction-technology firms have garnered $10 billion in investment funding from 2011-17.
- Katerra, a US based start-up has more than US$1bn in funding for its vertically integrated business
- Borealis Ventures tracks more than 70 construction ventures

EXHIBIT 3: THE CITY OUTSOURCED

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EXHIBIT 3: THE CITY OUTSOURCED

"Quayside," a 12-acre slice of Toronto waterfront in line to be developed by Sidewalk Labs, the urban tech focused subsidiary of Google parent company Alphabet. The company is now primarily focused on turning the patch of city-owned land into what it calls the "world's first neighbourhood built from the internet up."

- Five dimensions – housing, energy, mobility, social services, & shared public spaces – with an aim to "serve as a model for sustainable neighbourhoods" around the world
- Incudes a data-harvesting, wifi-beaming "digital layer" that would underpin each proposed facet of Quayside life

EXHIBIT 4: BUILD TO RENT

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EXHIBIT 4: BUILD TO RENT

Build to Rent (BTR) is the quickest growing residential class worldwide, offering highly tailored, community-focused housing options.

These will typically be communities of 100's of apartments, long-term leases, no bonds, high sustainability and amenity values.

- Common in Germany, France and the US
- Marks a professionalization of landlord functions, including elements of social services, co-working and space as a service
- Forecast $AUD300bn Market in Australia

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EXHIBIT 5: DIGITAL TRANSFORMATION

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EXHIBIT 5: DIGITAL TRANSFORMATION

The engineering and construction industry is at the cusp of a new era, with technology start-ups creating new applications and tools that are changing how companies design, plan, & execute projects*.

It is construction's turn to experience the sweeping changes that digital processes have made in other areas.

- The future is here, just not evenly distributed
- LIDAR, Drones, Robotics, Laser Scanning, VR/AR, parametric software contribute to high-fidelity, joined-up, design & construction process
- *Refer McKinsey reports on Digital Transformation in the Construction Industry

EXHIBIT 6: SIGNAL & SPATIAL ECONOMIES

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EXHIBIT 6: SIGNAL & SPATIAL ECONOMIES

A highly speculative use of generating value is to measure and capture the exchange of information between nodes on the machine web.

This means that information that is personally generated could be personally beneficial without recourse to divulging personal information.

- Private spaces installed with sensing infrastructure to generate specific data, and anonymised data and signal (machine web transactions)
- Participants receive rebates to significantly offset cost of housing making UBI possible and meaningful

THE PROMISES OF CHANGE:

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A NEW MANIFESTO:

Design factors fully encoded, situated in real world data, AI assisted, algorithmically driven, optimised.

Construction is ruthlessly optimised to minimize waste and maximise value through every process.

Housing value is tied firstly to minimizing harm and maximizing health, seen as infrastructure.

Built environment generates data, energy and income, contributes to health & wellbeing, circular & recurring.

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Tallwood is changing the way New Zealand goes about building. We help our clients to design and produce high quality buildings faster, more cost-effectively and more sustainably than the traditional building process.

Tallwood designs components that are manufactured in our factory, then we assemble the building onsite, ready for completion. We help de-risk the project for our clients by bringing certainty to the process.

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HNZ AKARANA

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TE WHAITI / MINGINUI AERIAL PLAN

NSC TAWHITIWHITI PAPAKAINGA

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TALLWOOD HOME

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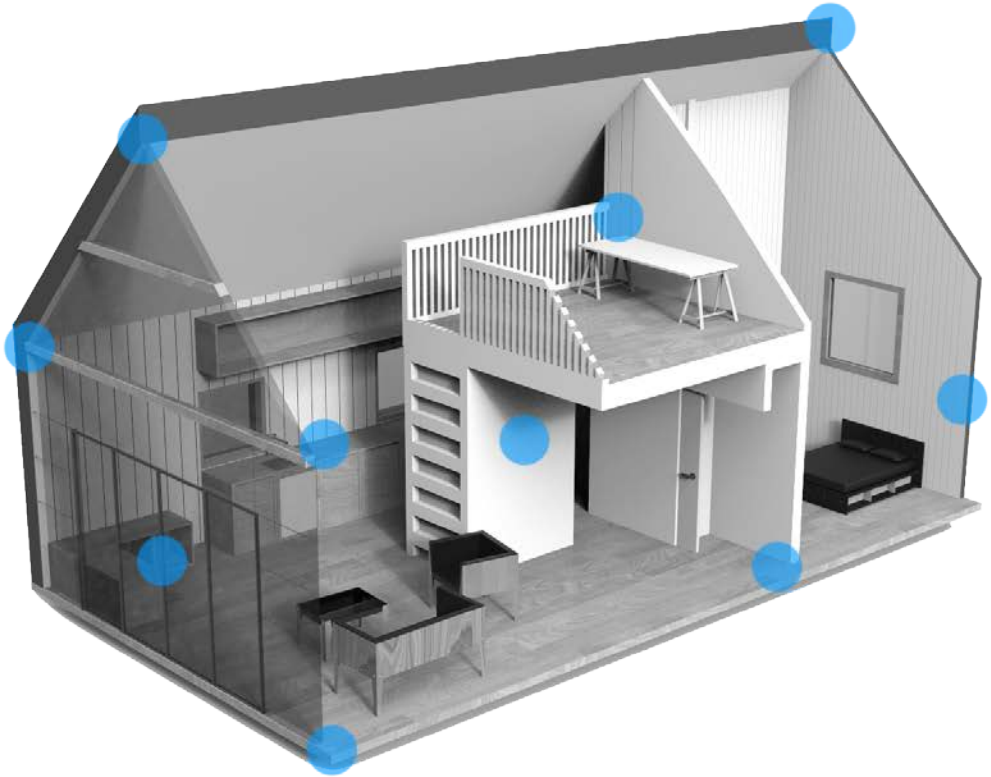
01.
Create Affordable Timber based typologies to ensure quality, carbon sink using renewable materials

02.
Embed RDIF/WIFI sensors to register environmental changes – temperature, humidity, movement – link back to BIM Model/Digital Twin



03.
Register IP addresses of each sensor to server – spatial and occupant classification

04.
Share $$ of information sharing and machine web transactions to occupant

05.
Oversubscription – discounted buildings/ rent offset mortgage deposit – destroy boom bust cycle

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HOUSING COULD BE FREE

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FINISH

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