UNLOCKING AFRICA'S NEW ERA
WITH PROPTECH

Turner & Townsend

4TH ANNUAL

AFRICA
PROPTECH
FORUM
VIRTUAL
SUMMIT

AFRICA'S NUMBER ONE REAL ESTATE
TECHNOLOGY EVENT

Blockchain, IoT and AI in Real Estate

Beyond the jargon - practical implications for Africa's real estate market and a deep dive on how we use data for better performance

30 August 2021

making the **difference**

Agenda

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Intellect IO

Project Director

The objective

1 Understanding the Technologies

2 How they are being used

3 What it means to us in an Africa context

Agenda

Time	Topic	Leader
13.10	Introductions	KvR
13.15	Jargon Buster	KvR / GC
13.25	Practical application	KvR
13.35	An Africa context discussion	KvR / GC

DIGITAL TRANSFORMATION

TECHNOLOGIES

USE CASES

TRANSFORMA
INSIGHTS

transformainsights.com

INTERNET OF THINGS
Telematics • Machine-to-Machine • IoT Platforms
Industry 4.0 • Operational Technology
Smart Factory • Sensors

HYPER-CONNECTIVITY
5G • LTE • 3G • 2G • Narrowband • LoRa • Sigfox • NB-IoT
NFV/SDN • Visible Light Communications
Private networks • Bluetooth • Fibre • WiFi • WiFi6
WiFi HaLow • Personal Area Networks • 802.15.4 • RFID

HUMAN-MACHINE INTERFACE
AR • VR • Screens • Video Processing • Neural Sensing
Haptics • Natural Language Processing • Quantified Self
Motion Control • Proactive Interfaces • Exoskeletons

ARTIFICIAL INTELLIGENCE
Machine Learning • Deep Learning • Machine Vision
Cognitive Computing • Semantic Web
Artificial Narrow Intelligence • Artificial General Intelligence
Superintelligence • Neural Networks • Data Ontologies

DISTRIBUTED LEDGER
Distributed Data Storage • Blockchain
Proof-of-Work • Smart contracts

DATA SHARING
Big Data • Data Lake • Data Analytics • Data Exchanges
Data Trading Platforms • Security-by-Design • Privacy & Trust
Personal Digital Information Management • Data Sovereignty
Data Streams • Data Anonymisation • Digital Identities

PRODUCT LIFECYCLE MGMT
Digital Twin • Manufacturing Process Management
CAD/CAM • Knowledge-Based Engineering
Predictive Engineering Analytics • System Modelling
Incremental Materialisation • Physical Twin • Circular Economy

ROBOTIC PROCESS AUTOMATION
Task Automation • Virtual Assistants • Bots
ERP • CRM • AI-assisted RPA

EDGE COMPUTING
Cloud • Hybrid • On-Premises • Compute Edge • Device Edge
Fog Computing • Software Edge • Software Containers
Hypervisors • Datastream Processing

AUTONOMOUS ROBOTIC SYSTEMS
Autonomous Driving • Nanobots • Drones/UAVs
Swarm Robotics • Precision Robotics

3D PRINTING & ADDITIVE MANUFACTURING
Agile Production • Nano-factories • Biological Printing
Perishable Goods Printing • Molecular Assembly
Rapid Prototyping

FUTURE TECHNOLOGIES
Graphene • Quantum Computing • Human Re-engineering
Superconductivity • Nano Particles • Smart Materials
Olfactory Technology • Energy Harvesting • Smart Dust

ENTERPRISES
Systems • Culture • Partners • Change Management • People • Process • Finance • Business Model

BUSINESS EFFICIENCY

Data Analysis
Customer Behaviour Analysis • Demand Forecasting
Knowledge Management & Horizon Scanning
Data Scrubbing • Customer Segmentation
Business Process Forecasting • Geophysical Analysis
Risk Analysis • Compliance Analysis • Feedback Analysis

Process Optimisation
Churn Management • Inventory Management
Personalised Marketing • System Optimisation
Logistics & Transport Optimisation • Workflow Optimisation
Recommendation Engines • Dynamic Pricing

Decision & Automation
Fraud Detection • Computer Assisted Diagnostics
Trading Strategies • Intelligent Recruitment and HR
Assisted Decision Making • Smart Customer Support
Repetitive Process Automation

DATA-CENTRIC BUSINESS MODELS

Data Stream Processing
Threat Detection • Intrusion Detection • Video Processing
Still Image Processing • Complex Image Analysis
Machine Translation • Predictive Maintenance
Sentiment Analysis • Traffic Monitoring

User Interaction
Next Generation Search • Voice Authentication
Quantified Self • Chatbots and Digital Assistance
eGovernment

New Data Economy
Cryptocurrency • Smart Contracts • Proof-of-Work
Digital Identity • Supply Chain Audit • Immutable Records
x-as-a-Service • Data Exchange • Data Monetisation

CONNECTED THINGS

Machine-to-person
Personal Monitoring & Tracking • Connected Vehicles
Portable Information Terminals • Office Equipment
IT Infrastructure • Payment Terminals • White Goods
Personal Assistance Robots • Smart Speakers/Media Devices

Autonomous Systems
Asset Tracking & Monitoring • Remote Process Control
Inventory Management & Monitoring • Smart Grid
Remote Diagnostics & Maintenance • Autonomous Vehicles
Real World 'Visualisation' • Precision Specialist Robots

Smart Environment
Alarms • CCTV • Access Control & Intercomms • HVAC
Building Management Systems • Lighting
Parking Space Monitoring • Environmental Monitoring
Public Information/Advertising Screens • Road Infrastructure
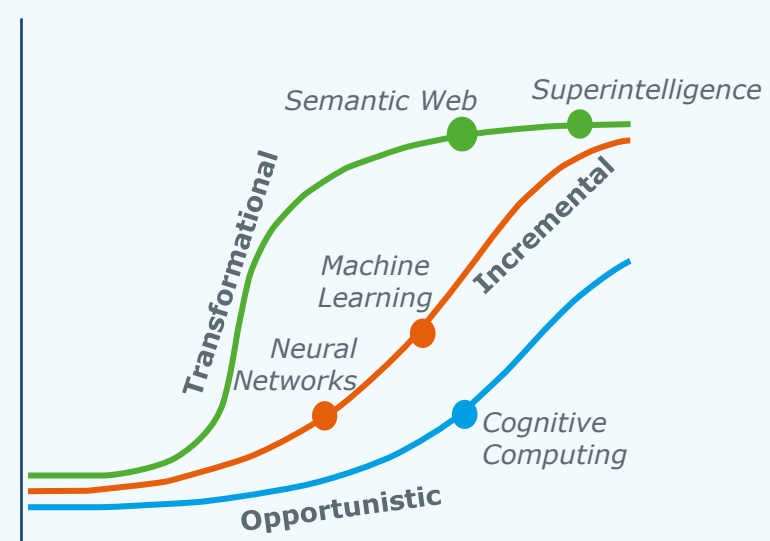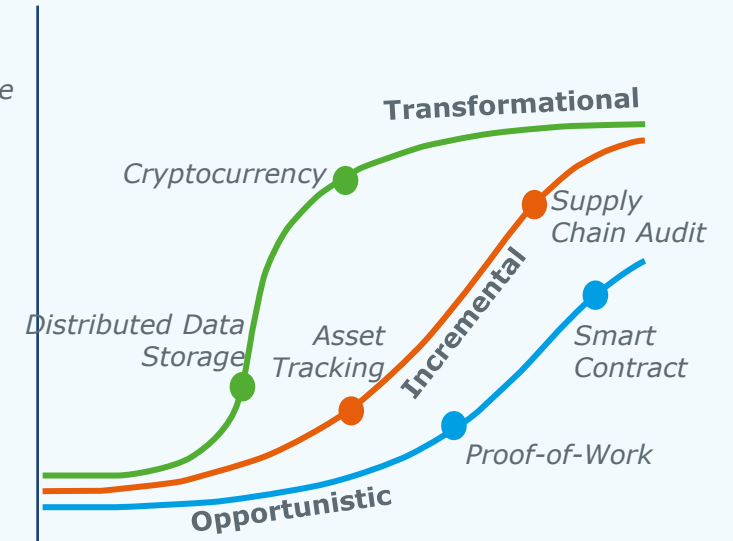
Big words – so what?

IoT

Artificial Intelligence

Blockchain

Blockchain

A shared, **immutable ledger,** that facilitates the recording of transactions.

Highly effective in sharing information between parties, instils trust and can be used for many purposes. For example recording activities, provenance of materials and often linked with a smart contract.

Blockchain

50+ BLOCKCHAIN REAL WORLD USES CASES

GOVERNMENT
Essentia develops world's first blockchain solution to manage international logistics hub together with Traffic Labs and the Finnish Government

IDENTIFICATION
Voter registration is being facilitated via a blockchain project in Switzerland spearheaded by Uport.

MOBILE PAYMENTS
The blockchain ledger that Ripple uses has been latched onto by a group of Japanese banks, who will be using it for quick mobile payments.

INSURANCE
A smart contract-based blockchain is being used by Insurer American International Group Inc as a means of saving costs and increasing transparency.

ENDANGERED SPECIES PROTECTION
The protection of endangered species is being facilitated via a blockchain project that records the activities of these rare animals.

CARBON OFFSETS
IBM is using the Hyperledger Fabric blockchain in China to monitor carbon offset trading.

ENTERPRISE
Ethereum's blockchain can be accessed as a cloud-based service courtesy of Microsoft Azure.

BORDER CONTROL
Essentia has devised a border control system that would use blockchain to store passenger data in the Netherlands.

SUPPLY CHAINS
IBM and Walmart have partnered in China to create a blockchain project that will monitor food safety.

HEALTHCARE
A number of healthcare systems that store data on the blockchain have been pioneered including MedRec.

SHIPPING
Shipping is a natural fit for blockchain, and Maersk have been trialling a blockchainbased project within the maritime logistics industry.

REAL ESTATE
Blockchain is now being used to complete real estate deals, the first of which was conducted in Kiev by Propy.

ENERGY
Essentia is developing a test project that will help energy suppliers track the distribution of their resources in real time, whilst maintaining data confidentiality.

LAND REGISTRY
Land registry titles are now being stored on the blockchain in Georgia in a project developed by the National Agency of Public Registry.

COMPUTATION
Digital Currency Group are helping Amazon Web Services examine ways in which the distributed ledger technology can help improve database security.

ADVERTISING
New York Interactive Advertising Exchange has been experimen-ting with blockchain as a means of providing an ads marketplace for publishers.

BORDER CONTROL
Essentia is developing a blockchain project for border control that will allow customs agents to record passenger data from an array of inputs and safely store it.

JOURNALISM
Decentralized journalism, as enabled by blockchain technology, has the potential to prevent censorship and increase transparency, as Civil has shown.

WASTE MANAGEMENT
Waltonchain is using RFID technology to store waste management data on the blockchain in China.

ENERGY
Food importation is another industry where blockchain is proving its worth, with Louis Dreyfus Co trialling a soybean importation operation using this technology.

TAXATION
In China, a tax-based initiative is using blockchain to store tax records and electronic invoices led by Miaocai Network.

ENERGY
Chile's National Energy Commission has started using blockchain technology as a way of certifying data pertaining to the country's energy usage as it seeks to update its electrical infrastructure.

RAILWAYS
Russian rail operator Novotrans is storing inventory data on a blockchain pertaining to repair requests and rolling stock

DIAMONDS
The De Beers Group is using blockchain to track the importation and sale of diamonds.

FINE ART
By storing certificates of authenticity on the blockchain, it's possible to dramati-cally reduce art forgeries, as one blockchain project is proving.

NATIONAL SECURITY
For the past two years, the US Department of Homeland Security has been using blockchain to record and safely store data captured from its security cameras.

TOURISM
In a bid to boost its tourism economy, Hawaii is examining ways in which blockchain-based cryptocurrencies can be adopted throughout the US state.

ENTERPRISE
Google is building its own blockchain which will be integrated into its cloud-based services, enabling businesses to store data on it, and to request their own white label version developed by Alphabet Inc

MUSIC
Arbit is a blockchain-based project led by former Guns N Roses drummer Matt Sorum seeking a fairer way to reward musicians for their creative efforts.

FISHING
Blockchain technology has been used to provide a transparent record of where fish was caught, as a means of ensuring it was legally landed.

MATTEO GIANPIETRO ZAGO

THE INTERNET OF BLOCKCHAIN FOUNDATION

Blockchain, IoT &AI in RE

Internet of Things

The Internet Of Things describes the network of physical objects, so known as, **"things"** — that are embedded with **sensors,** software, and other technologies that is used for the purpose of connecting and exchanging data with other devices and systems over the Internet.
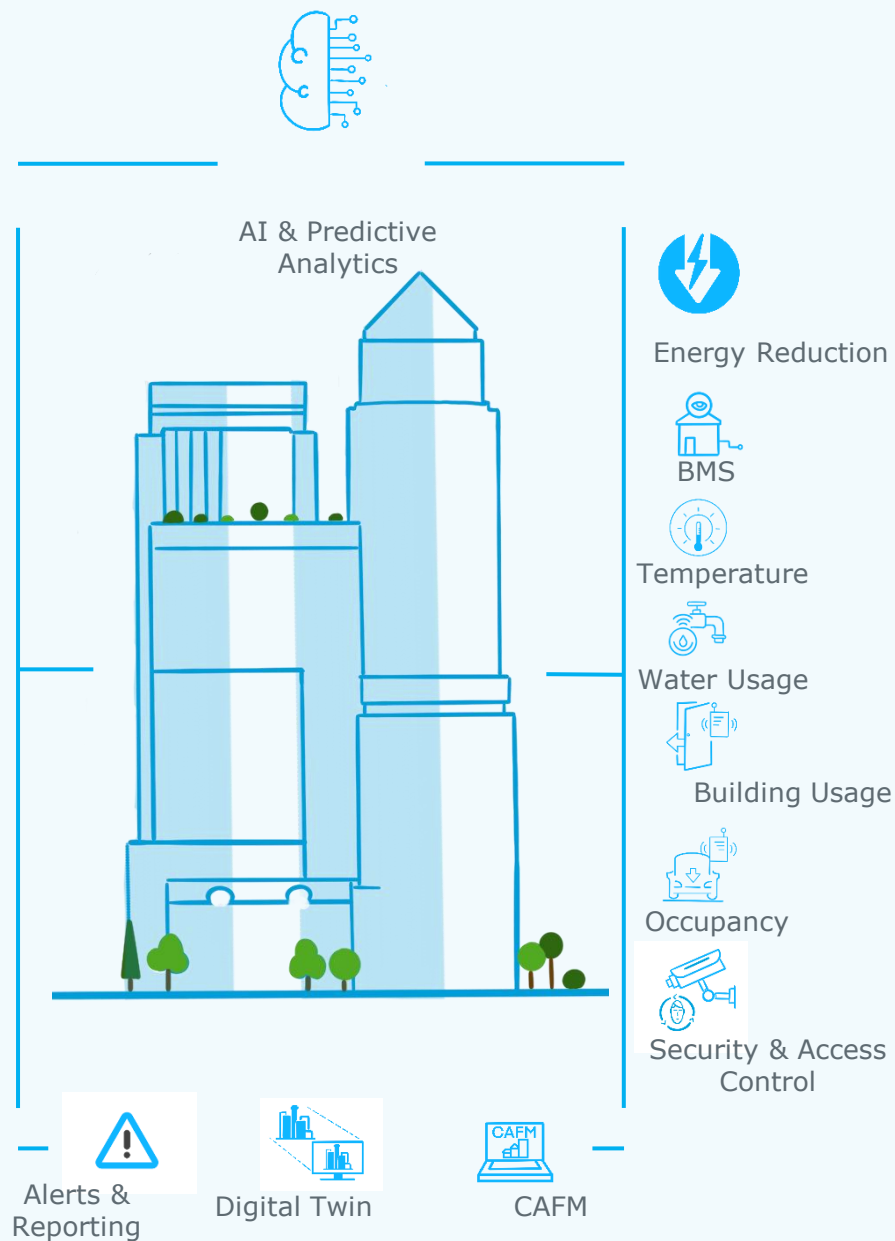
Very effective in gathering real-time data about your building – in particular building use and consumption.

Blockchain city NATURE

Internet of Things

144 different Building Technologies

AI & Predictive Analytics

Waste Management

Wayfinding

Food & Refreshments

Conversational User Experience (CUX)

Air Quality & VOC

Smart Lighting

Energy Reduction

BMS

Temperature

Water Usage

Building Usage

Occupancy

Security & Access Control

Alerts & Reporting

Digital Twin

CAFM

Artificial Intelligence

Description of AI

AI is a type of technology that draws logical conclusions or simulates human intelligence in order to parse data contextually. AI uses sophisticated algorithms and analysis to provide educated information about events in the future. It also provides analysis that is used to trigger precise and accurate actions based on analytical findings.

Property Valuations
Property Management
Lead generation (incl. Chatbots)
Forecasting
Preventative Maintenance
Contract abstraction
Space utilisation and optimisation

Artificial Intelligence

Property Valuations Across South Africa

- Property characteristics

- Historic Property sales

- Historic Area Trends

- Trends across South Africa

Purchase Price
- High and Low property prices

Global RE Mega Trends

Sustainability

Social Value

Productivity

Estate Optimisation

Digital

Reduce Carbon footprint

Data usage

Blockchain, IoT &AI in RE

Global world applications of the Technologies

Hen na Hotel (Japan)

Affordable Housing

Digital token on a blockchain backed by affordable housing expand quality home production. Land ownership
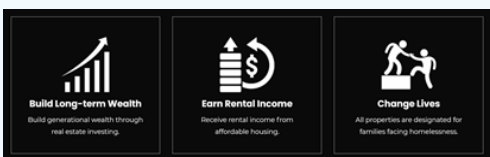
Shared Accommodation

Concierge robots with AI operate to maximise the efficiency. Pay as you go based on consumption

Hospitals & Clinics

IoT cloud enables a hospital to track and analysis patients. Equipment tracking.

Online Market Place

Stock control and Robotic Fulfilment
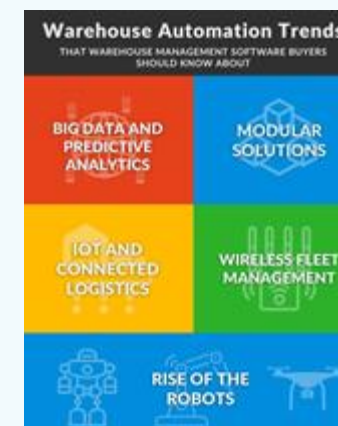
Productivity in factories

AI led automation accelerates the productivity in a factory with improved defect prediction

Applying all technologies in construction
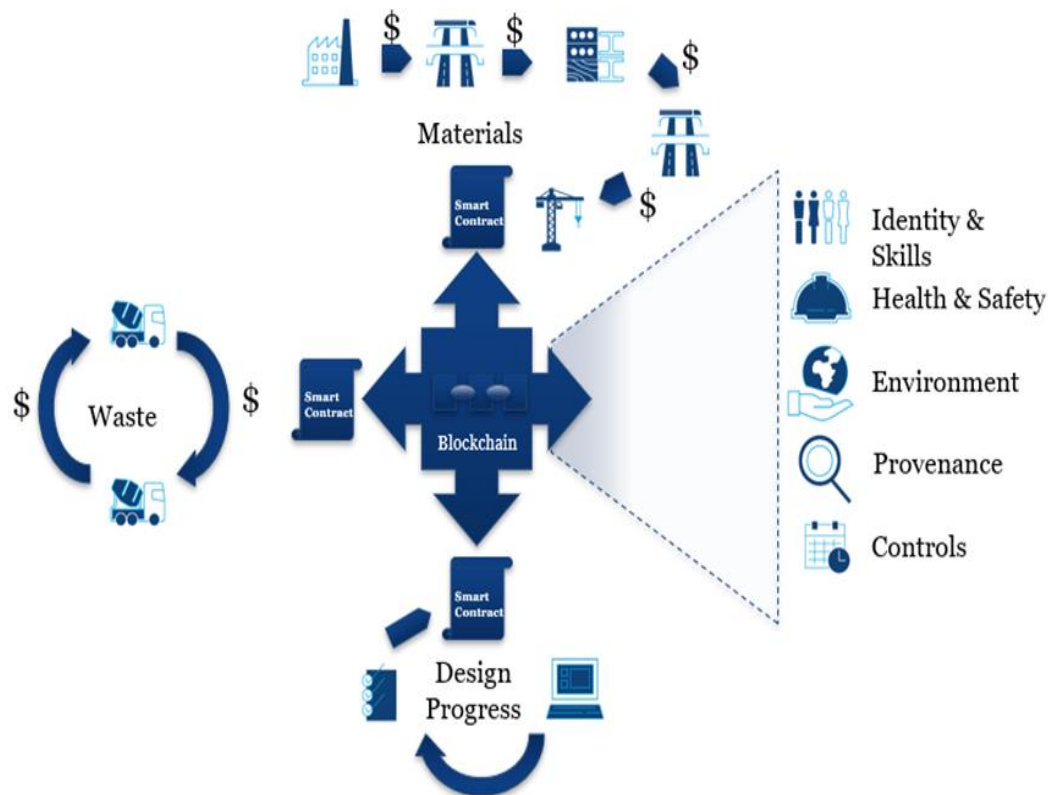
Blockchain, IoT and AI

- **Supply chain liquidity –** payment as soon as work is complete
- **Smart Logistics –** Just in time delivery
- **Materials Management -** Stock
- **Smart reporting** – near time information
- **Environmental management** – carbon emissions, noise
- **Predictive efficiency** – streamlining construction
- **Health & Safety** – right skill, right place safety 1st

Companies using Blockchain / IoT in Africa in the RE space

Africa

- **A global Tech Giant in Kenya —** use IOT for lighting control, air control, electrochromic glass and BMS
- **Centre for Affordable Housing in Africa,** developed South Africa's first blockchain-based property register.
- **IBM -** Precision agriculture
- **Land Layby Group – Kenya -** Use blockchain to tackle land fraud
- **Bitland – Ghana -** They are using the distributed digital ledger to boost the integrity of land records
- **Sarit Centre Mall** - Use sensors to monitor footfall
- **The Hub – Karen Mall -** Use sensors to monitor footfall
- **ABSA -** tech monitoring all their buildings and centralising the info. They then harvest the data from the data lake. They are build an app to use this data to inform design decisions for post covid office layouts.

Companies in Africa that have committed to Zero Carbon Emissions

Companies in Africa

Global Organizations with Offices in Africa

Discussion: Deep Dive into how we use data

Setting up for Success

- So what are the key things we need to do to use the data better?

- What does the new supply chain look like?

- What do we need to do to harness the opportunity?

- What are some practical examples of using these technologies?

Practical Question

- Scaling up – what are the challenges?

- Over promising - is it really solving our problem?

- Will these technologies replace jobs?

- All great that developed countries deploy these solutions – they are expensive (skills & tech cost)so why would I want to deploy them in Africa?

Closing out

Q What have we discussed?

- Blockchain, IOT and AI are only part of the equation

- When combined they can provide very useful data to help optimise performance

- There are green shoots and this is encouraging

- We need to think data and data structure it needs to be right

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