Risks to Digitalising our Food System

Three areas for regulation

Britt Kritzler
Digital Transformation Consultant

britt.kritzler@gmail.com
+44 (0)78111 70873
Global B2B IOT set to generate ~$300bn in 2020, farming most radically changed by technology

Opportunities

- High level of investment (M&A, VC)
- Technology addresses real business issues
- Increasing # trials funded by large corporate

Challenges

- Slow-to-adopt population
- Internet connectivity issues
- Unclear regulation around data

Vast range of IOT devices and applications

Sources: Bain Insights: Choosing The Right Platform For The Internet Of Things, Cisco Visual Networking Index: Forecast and Methodology, 2016–2021; ZDNet, The five industries leading the IOT revolution; Agfunder News: Report: Smart Farming Can Make Food Supply Uncertainty and Volatility a Thing of the Past
IOT & Blockchain applications stand to resolve a range of food system inefficiencies

Food operators
- Supplier selection
- Fair & ethical trading
- Feed quality
- Operational efficiency
- Animal welfare
- Environment

Consumers
- Food safety & hygiene
- Traceability
- Provenance/Authenticity
- Nutrition

Introduction & Blockchain
Supply Chain Applications
Protocols & Cyberthreats
Closing Thoughts
Smart Agriculture has matured into encompassing the entire supply chain

- Feed
- Farming / breeding
- Processing
- Packaging
- Wholesale
- Retail
- Repeat purchase

Introduction & Blockchain

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Closing Thoughts
ROI models extend beyond food system – new technologies empower collaborations

Project: Unilever, Sainsbury’s and the UK Department for International Trade (DFIT)

Food system

- Smallhold tea farmers
  - Standardised records of sustainability information

Tea production (Unilever)

- Smart contract enforcement of supplier selection

Retail (Sainsbury’s)

- Traceability & repeat purchase

Sustainability finance

- Smallhold tea farmers
  - Standardised records of sustainability information

UK DFIT

- Provenance of sustainably produced tea imports

CSR Lenders/banks

- Preferential financing terms

Sustainable farming practices
Not all business problems require a Blockchain solution

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<th>Assurance</th>
<th>Sector</th>
<th>Agency</th>
<th>Technology</th>
<th>Country</th>
<th>Blockchain</th>
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<td>Food safety &amp; hygiene</td>
<td>Gastronomy</td>
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<td>Queensland University</td>
<td>Food Agility CRC</td>
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Blockchain makes data collected on IOT devices available to all (authorised) parties, in real-time & continually – no middleman

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Closing Thoughts
Mobile operators chose not to invest in IOT, leading to various long-range low-bandwidth protocols – two dominant. Two-thirds of IoT networks globally run LoRa & Sigfox; unlicensed technologies.

Smart Agriculture IoT protocols focus on delivering occasional bursts of small data packages over long distances; Low-Power Wide-Area (LPWA)

Source: IHS Markit Technology “Can Low-Power Wide-Area (LPWA) IoT Networks Capitalize on 5G Confusion?”

Varying risks at every level of interconnectivity

**1. IOT hardware/software**
- Low-power wide-area networks (LPWAN) not regulated
- Emergence of different (licensed) protocols
- “Winner takes all” principle

**2. IOT integrated solutions**
- Engineering/machinery partnerships
- Strategic data connectivity deals
- Own protocols for data exchange

**3. IOT infrastructures**
- Attacks on Domain Name Servers (DNS) common
- Public key infrastructure (PKI) in Smart Agriculture not regulated
- Human attack vector

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**Introduction & Blockchain**

**Supply Chain Applications**

**Protocols & Cyberthreats**

**Closing Thoughts**
1. Smart Agriculture has evolved, Blockchain tested on entire value chain issues
2. Blockchain generates security protocols that are impenetrable
3. Regulators have been late to legislating LOWAN data exchange protocols
4. Increasing amounts of sensitive data are digitally shared
5. Data management regulation to ensure User benefits and systems security
Thank you!

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