



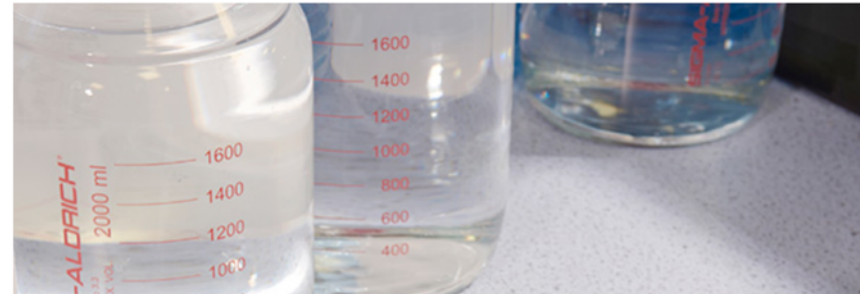
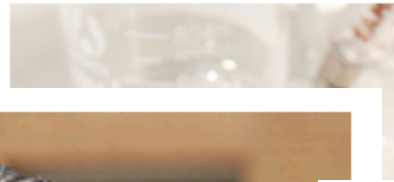
DLT & Food Traceability

Collaboration

Interoperable Quality Data & Assured Trust

21 Sep 18 @ IET, London

patrick.curry@bbfa.info



©Getty

Willy Selten, who has appealed his two-and-a-half-year sentence for selling 300 tonnes of horsemeat as beef



©Alamy

Shift workers in Qingdao, China, descale, debone and repackage fish products for export



©Daniel Stier

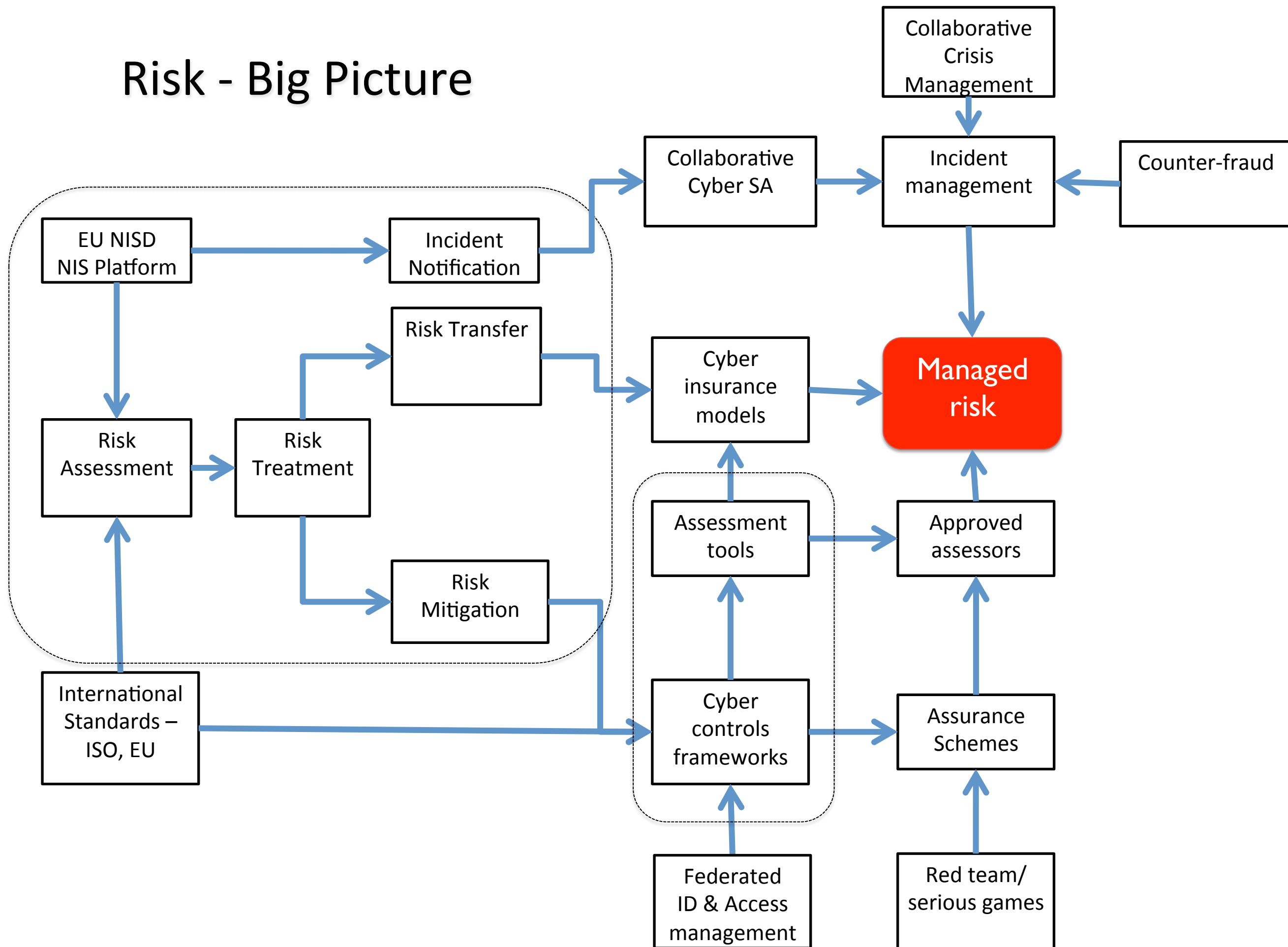
Using a laser knife to test the identity of a fish fillet

Why should I care?

All about risk....

- Complexity
 - Compliance
 - IT & cyber
 - Fraud
 - Branding & reputation
 - Opportunity & competition
-
- Globalisation & supply chains → collaboration
 - Shared risks → collaborative risk mitigation
 - Shared data → single view of the truth
 - Secure collaboration requires the controlled sharing of sensitive information
-
- How much does your organisation want to be trusted?

Risk - Big Picture

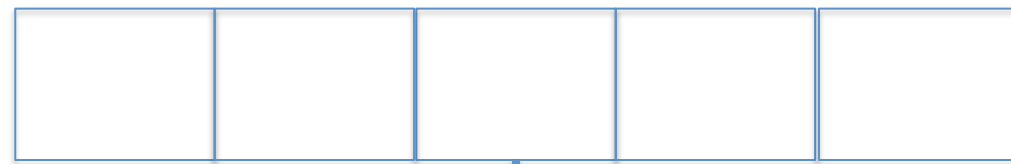


Impact of Various Regulations in the Pipeline

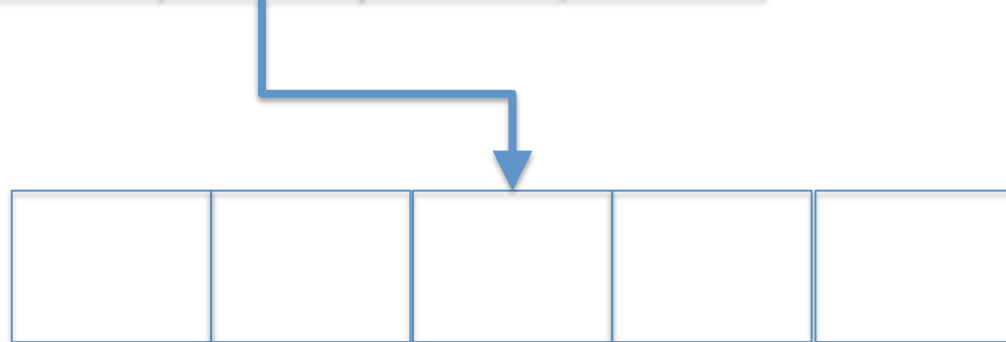
Source Dr Anthony Kirby 2016

	Timing	Buy-side impact	Sell-side impact	Custodian impact	FMI impact	Gov / LE Impact	Risk Impact	Business impact	Systems impact	Data impact
AIFMD Reporting	Jul 2014	LOW-HIGH	LOW-MED	MEDIUM	LOW	LOW	LOW-HIGH	LOW-HIGH	LOW-HIGH	LOW-HIGH
TD 2	Jul 2015	LOW	LOW	LOW	LOW	MEDIUM	LOW	LOW	LOW	LOW
UCITS V	Mar 2016	LOW	LOW	LOW	LOW	LOW	LOW	LOW	MEDIUM	MEDIUM
EMIR	June 2016	LOW-HIGH	HIGH	MEDIUM	MED-HIGH	MEDIUM	MED-HIGH	LOW-HIGH	LOW-HIGH	HIGH
MAR	Jul 2016	MEDIUM	HIGH	MED-HIGH	HIGH	MEDIUM	MEDIUM	MEDIUM	MED-HIGH	HIGH
SFTR	>Jan 2017	MED-HIGH	HIGH	LOW	MEDIUM	MEDIUM	MEDIUM	MED-HIGH	MED-HIGH	HIGH
PRIIPs	>Mar 2017	HIGH	LOW	MED-HIGH	LOW	MEDIUM	MEDIUM	HIGH	HIGH	HIGH
MLD 4	Jun 2017	HIGH	HIGH	HIGH	LOW	MEDIUM	HIGH	MEDIUM	HIGH	HIGH
CRS	Sep 2017	MED-HIGH	HIGH	HIGH	LOW	MEDIUM	MEDIUM	MEDIUM	MEDIUM	HIGH
Benchmarks	Dec 2017	LOW-HIGH	HIGH	MEDIUM	HIGH	MEDIUM	HIGH	HIGH	MEDIUM	HIGH
ELTIF/MMR	Dec 2017?	LOW-HIGH	LOW	MEDIUM	LOW	LOW	LOW	MEDIUM	MEDIUM	MEDIUM
MIFID 2	Jan 2018	HIGH	HIGH	MEDIUM	HIGH	LOW	MEDIUM	HIGH	HIGH	HIGH
IDD	Jan 2018	LOW-HIGH	LOW	MEDIUM	LOW	LOW	MEDIUM	MEDIUM	MEDIUM	HIGH
PSD 2	Jan 2018	LOW	LOW	MEDIUM	LOW	HIGH	LOW	LOW	LOW	MEDIUM
GDPR	May 2018	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
FRTB	Q1 2019?	LOW	HIGH	MEDIUM	LOW	MEDIUM	HIGH	MED-HIGH	HIGH	HIGH
CSDR settlement	Q1 2019?	MEDIUM	HIGH	HIGH	MED-HIGH	LOW	MEDIUM	MED-HIGH	MED-HIGH	HIGH

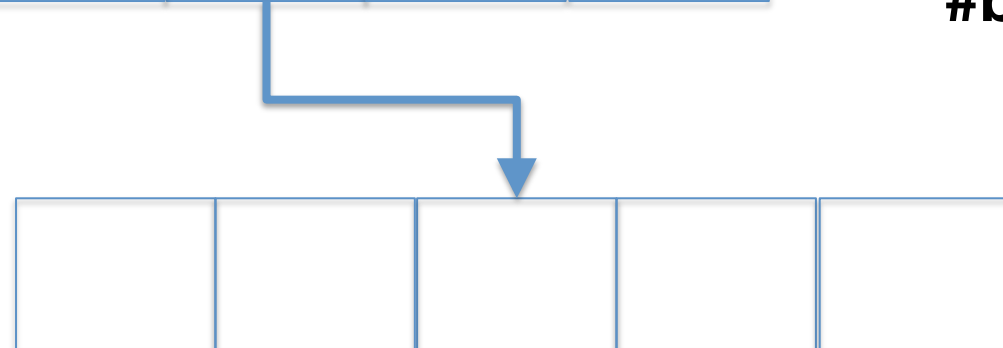
What is a blockchain?



A record or block
#block (cryptographic hash)



#block
#block with previous block(s)



And so on...
= a blockchain

Properties

- It creates a distributed ledger (hence Distributed Ledger Technology (DLT))
- Mass **distribution** – everyone has the same record. No disputes
- Near **immutability** (tamper resistant and tamper evident)
- **Decentralised** consensus decision making
- Legally recognised as **authoritative** in some jurisdictions

Blockchain and Distributed Ledger Technology scenarios



Financial

Redesign costly legacy workflows, improve liquidity and free up capital. Help reduce infrastructure costs, increase transparency, reduce fraud and improve execution and settlement times.



Retail & Manufacturing

Better supply chain management, smart contract platforms, digital currencies, and tighter cybersecurity.



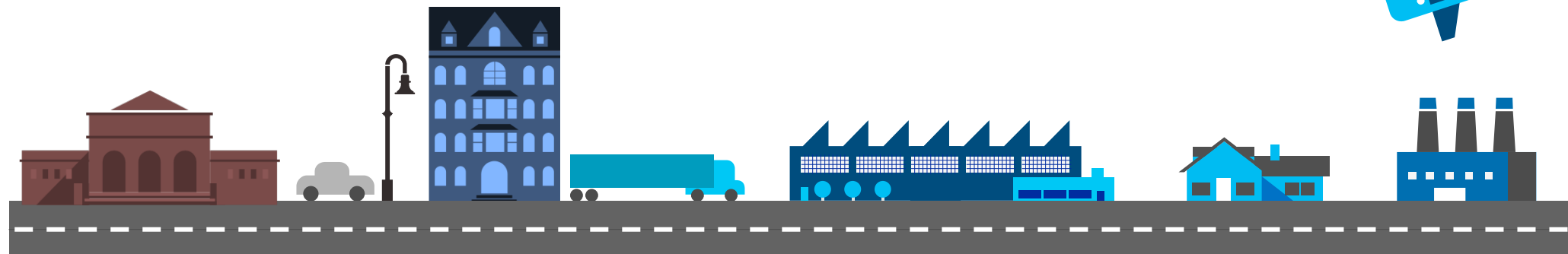
Healthcare

Removes third-party verifiers such as health information exchanges by directly linking patient records to clinical and financial stakeholders. Provides fast, secure, authenticated access to personal medical records across healthcare organizations and geographies.



Government

Increase transparency and traceability of how money is spent. Track asset registration, such as vehicles. Reduce fraud and operational costs.



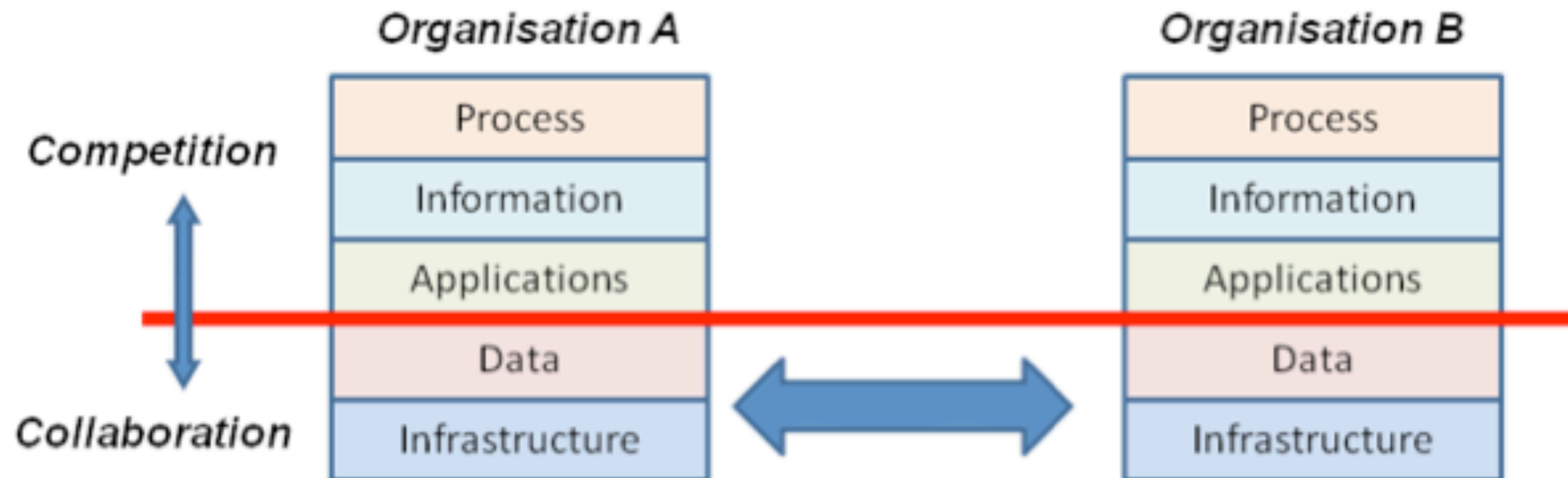


Popular scenarios where blockchains add value

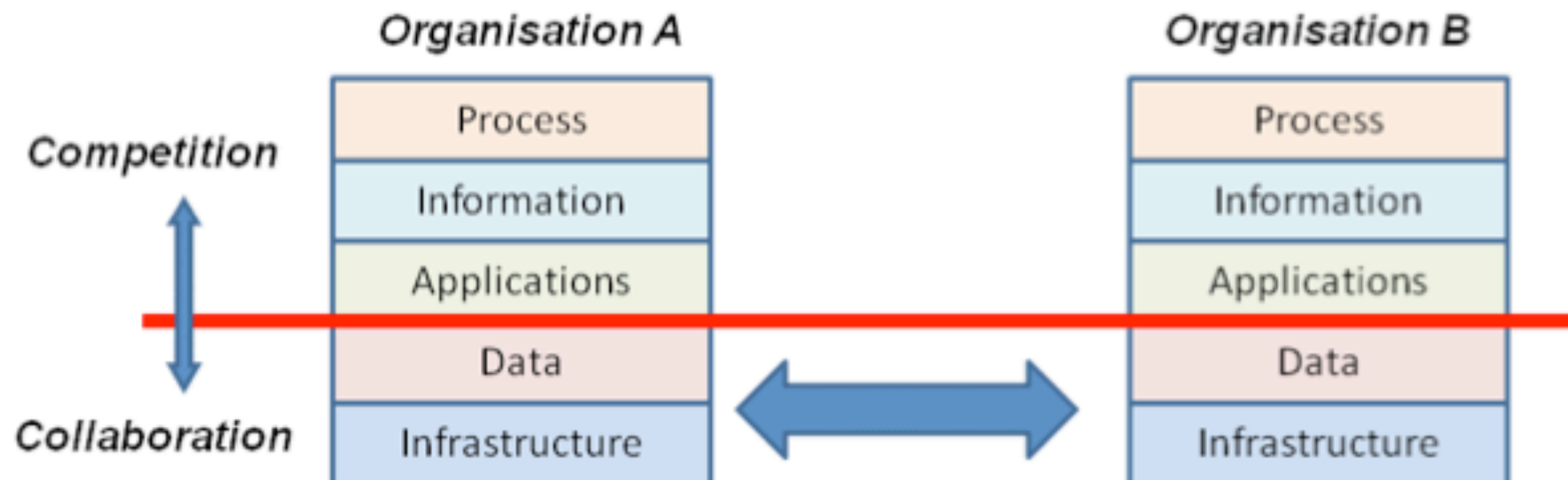
Financial	Insurance	Media	Asset Titles	IoT
Trading	Claim filings	Digital rights management	Diamonds	Device to Device payments
Deal origination	MBS/Property payments	Game monetization	Designer brands	Device directories
POs for new securities	Claims processing & admin	Art authentication	Car leasing & sales	Operations (e.g. water flow)
Equities	Fraud detection/ prediction	Purchase & usage monitoring	Home Mortgages & payments	Grid monitoring
Fixed income	Telematics & ratings	Ticket purchases	Land title ownership	Smart home & office management
Derivatives trading	Digital authentication	Fan tracking	Digital asset records	Cross-company maintenance markets
Total Return Swaps (TRS)	Asset management	Ad click fraud reduction	Government	Payments
2 nd generation derivatives	Automated underwriting	Resell of authentic assets	Voting	Micropayments (apps, 402)
The race to a zero middle office	Self-administered insurance	Real time auction & ad placements	Vehicle registration	B2B international remittance
Collateral management			WIC, Vet, SS, benefits, distribution	Tax filing & collection
Settlements			Licensing & identification	Rethinking wallets & banks
Payments			Copyrights	
Transferring of value		Software Development		Consumer
Know your client (KYC)		Micronization of work (pay for algorithms, tweets, ad clicks, etc.)	Identity	Digital rewards
Anti money laundering		Expanse of marketplace	Personal Objects	Uber, AirBNB, Apple Pay
Crowd Funding		Disbursement of work	Families of objects	P2P selling, craigslist
Peer-to-peer lending		Direct to developer payments	Digital assets	Cross company, brand, loyalty tracking
Compliance reporting		API platform plays	Multifactor Authentication	
Trade reporting & risk visualizations		Notarization & certification	Refugee tracking	Supply Chain
Betting & prediction markets		P2P storage & compute sharing	Education & badging	Dynamic ag commodities pricing
		DNS	Purchase & review tracking	Real time auction for supply delivery
			Employer & Employee reviews	Pharmaceutical tracking & purity
				Agricultural food authentication
		Medical		Shipping & logistics management
		Records sharing		
		Prescription sharing		
		Compliance		
		Personalized medicine		
		DNA sequencing		



Secure Collaboration in the Business Layer



Secure Collaboration in the Cyber SA and Decision Layer



BE



Employee - Gov

Employee - Industry

4 Contexts of Identity

Plus:

- Device ID
- Organisation ID
- Software Authentication
- Data Authentication

Citizen

Consumer



It is all about Risk

We need to identify ourselves to others, and vice versa, in a wide range of situations and particularly for electronic activities, which may require different Levels of Assurance.

4 Levels Of Assurance

1. LoA 4. Extra measures. 3 factor authentication (with second biometric). Strong hardware token. Optional federated Physical Access Control. Used in highly secure situations.
2. LoA 3.. High confidence in identity. Legally robust non-repudiation. 2 Factor Authentication E.g. employee authentication, digital signature, ID based encryption, secure email.
3. LoA 2. Some confidence of Identity. Expect some failures. Financial liability model E.g. credit cards, Know Your Customer.
4. LoA 1. Self assertion. E.g. mickey.mouse@microsoft.com.

HMG Office of
Government
Science report for
UK Prime Minister

Published
19 Jan 2016

Change in HMG

Industry
collaboration

NL, EE, KR, JP
participation
starting

**Identity & Access
Management
essential**



Government
Office for Science



Distributed Ledger Technology: beyond block chain

A report by the UK Government Chief Scientific Adviser

- Dec 2017
- Builds on GO Science Report
- 10 recommendations
- Collaboration & info centric
- **ROLO UK is key enabler**
- Emerging roadmap
- Participants from 200+ organisations
- 18 WGs rising to 23 with int'l participation
- 20+ DLT demonstrators
- APPG linking internationally



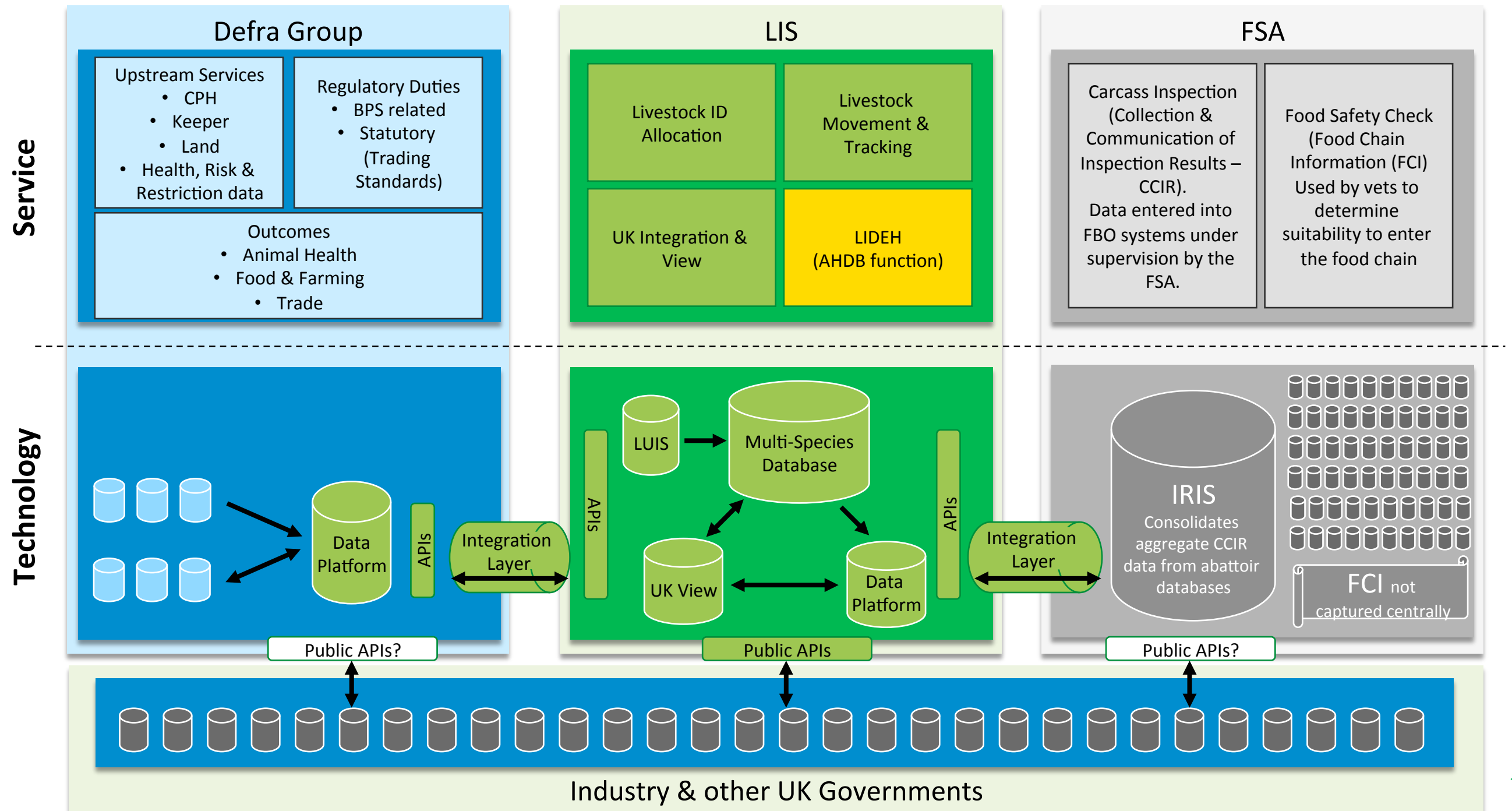
Distributed Ledger
Technologies for Public
Good: leadership,
collaboration and
innovation

Working Groups

- Legal
- Draft legal text
- Red Meat
- Fruit & Veg
- Food Data PMA
- Charities
- Health
- Maritime
- ROLO UK
- AML & KYC
- Aviation
- Police
- Identities
- Authentication
- Entitlement
- Master Data Management
- Token
- Land Registers & Conveyancing
- Assurance
- Insurance
- Borders
- Gambling

30+ demonstrators

Livestock Information Programme - Target Operating Model



Collaboration in Action

- Red Meat WG
 - 40+ organisations – regulators (FSA, Defra), retail (M&S+), processors, tech, finance, law enforcement
 - Pilots in Defra, FSA and industry
 - Develop collaborative requirements – market & regulation
 - Better shared data drives reuse drives significant business benefit
 - Border control and maritime connection
- Fruit & Veg WG
 - Including coffee and tea
 - International participation
 - Inputs from Legal WG
 - (Just starting.....)
- Food Data Policy Management Authority
 - Develop & manage national food data taxonomy
 - Feeds into standards and new authoritative registers

Wider Collaboration

- Legal
- Data
- Law enforcement
- Borders
- Maritime – container tracking
- Aviation – cargo tracking
- Transport – smarter
- Land Register & Conveyancing
- Assurance
- ROLO UK – scoring trustworthiness of UK organisations
ROLO NL, ROLO JP ++

Authoritative data requirements

- Farmer register
- Farm register
- HF ear tag register
- Asset tracking register
- Product validation

Cross-cutting investigation

- Beneficiaries food buying choices
- Cost to NHS of:
 - Obesity
 - Diabetes 2
- NHS investment in better food choices. Prevention.
- National impact on wellbeing and quality of life

Enablers

1. Collaborative governance
2. Catalogue of Collaborative Requirements
3. Securely accessible farmer register & Identifier registers
4. Securely accessible farmland ownership and tenancy contracts register
5. Securely accessible ear tag register
6. Interoperability mechanisms & architecture;
7. Authentication
8. GPS location/geofencing
9. Technological innovation & evolution
10. Communication, education and awareness: reference information repository
11. International allies and partners

Information Architecture for Global Food Security

IAGFS+ Network

Stakeholder-Led Network

Focus on Food Supply Chain

- Security
- Safety, Quality, Compliance
- Traceability, Provenance
- Sustainability, Waste
- Platform for engagement & innovation with funding from UK Science & Technology Facilities Council (STFC)
- Focused on understanding data and technology requirements and optimal configurations to meet food chain needs and enable global food safety and security.
- Addressing technological, food technical, analytical, financial, commercial, legal, and socio-political aspects

Aims

- Enable future development of an effective and relevant information architecture for global food security
- Globally connect stakeholders
- Evaluate value propositions in blockchains/distributed ledgers (DL) and other technologies
- Understand how to establish data provenance
- Coordinate 'proof of concept' works
- Develop and trial technology / tools
- Develop methods for scrutiny / verification
- Promote global adoption
- Enable SME access and engagement
- System capacity building (tools, guides, apps)

Principal Investigator: Dr Donna Champion; **Co-Investigator:** Professor Bob Stevens; **Steering Group Chair:** Dr Rachel Ward
Contact: donna.champion@ntu.ac.uk; bob.stevens@ntu.ac.uk; rachel@rwardconsultancy.com

Shared benefits & shared risks

Collaborate to compete

Collaborate for the nation

patrick.curry@bbfa.info