



Using DLT/blockchain to develop a reliable Assurance system for Gluten Free Oats



The background of the slide features a large, abstract graphic composed of several overlapping, tilted diamond shapes in various shades of green. A central diamond contains a photograph of a lush green field under a bright sky at sunset or sunrise.

Paul Mayfield

Hannah Rudman

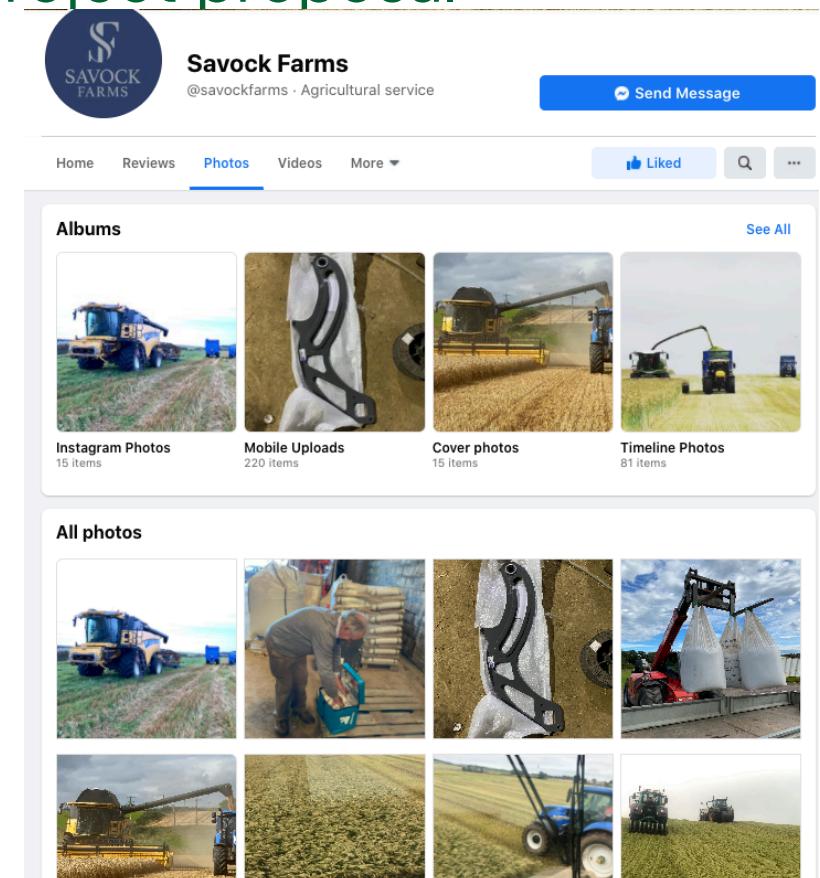
*SAC Consulting is a division of Scotland's Rural College
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Background

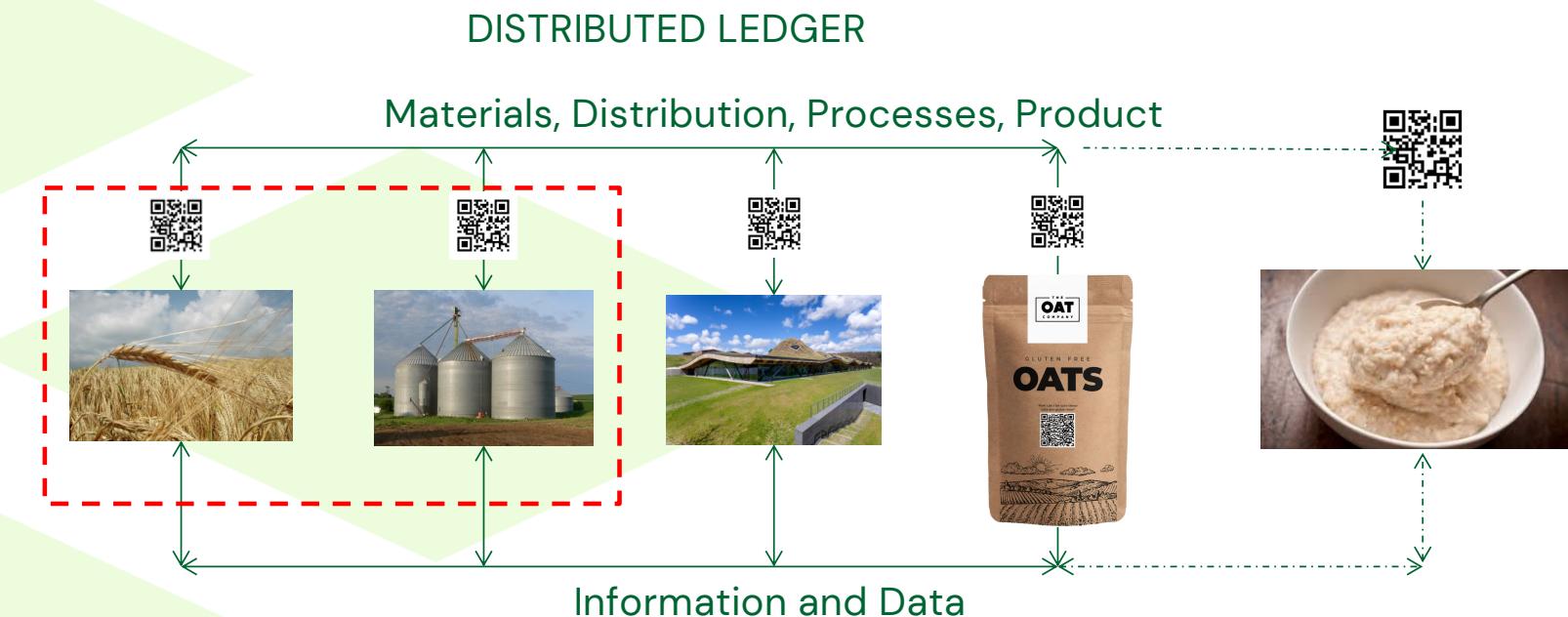
- Small group of farms in Aberdeenshire growing 1500 tonnes of gluten free oats
- Traditionally supplied local mill
- Have developed own agronomic protocol and plan to create own dedicated gluten-free processing facilities
- Approached SRUC to help provide assurance tool for gluten-free oats.

Background

- Initial UIF fund to develop team and project proposal
- KTIF funding to conduct a pilot study
- Project team
 - Scottish Oat Co (Savock Farm)
 - SRUC
 - Wallet Services
 - (Lloyds Register)



GF Oat Assurance Plan



DIGITAL BUSINESS IS DANGEROUS

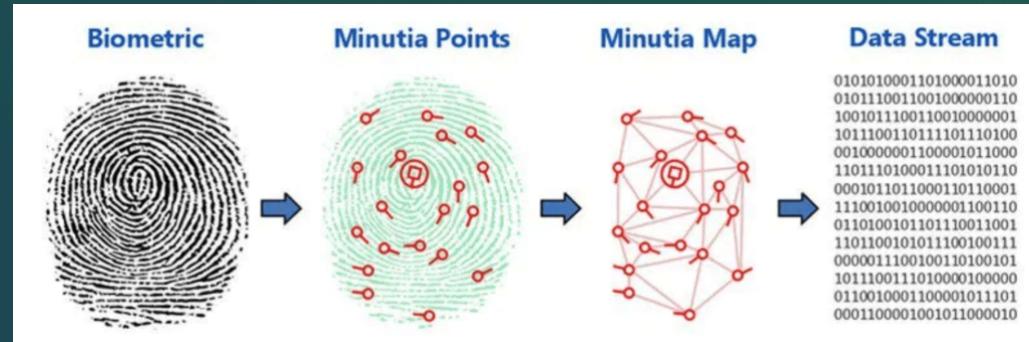
Marriott International 2020 data breach: 5.2 million customers affected

5181
breaches in 2019

7.9bn
records exposed

Facebook fined
£5bn

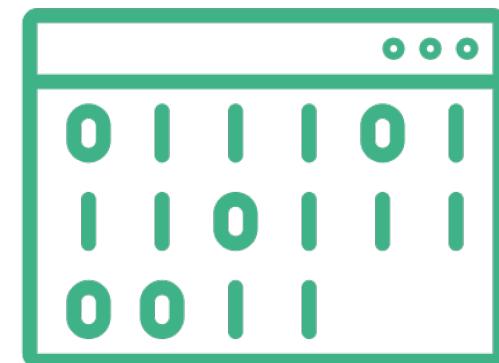
2019; BA fined
£183m



Businesses need data

We need to share data to complete shared goals

Building systems for sharing data is expensive



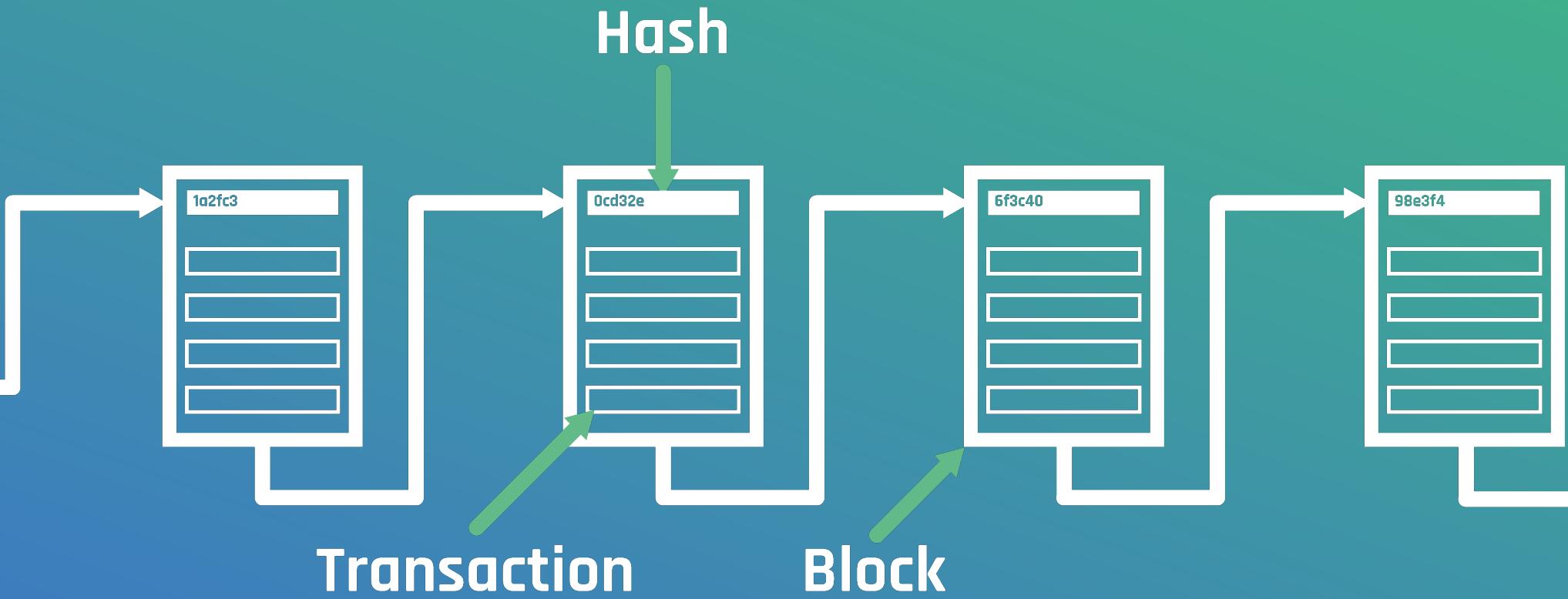
DLT means you can securely share data with confidence



Multiparty private permissioned DLT network



Consensus mechanism: proof of authority



Encryption: the computer process of converting data to an unrecognizable form

Hash: a cryptographic function that converts one value to another

Steps	Actor responsible	Evidence or data required to prove action	Data type (e.g. pdf document, numerical, photo, etc)	Datafield descriptions
Field block history	Farmer	Historical field records	PDFs	Field block number Farm ID Upload records
Drilling	Farmer			
Cultivating	Farmer			
	Tester			

Steps & Time

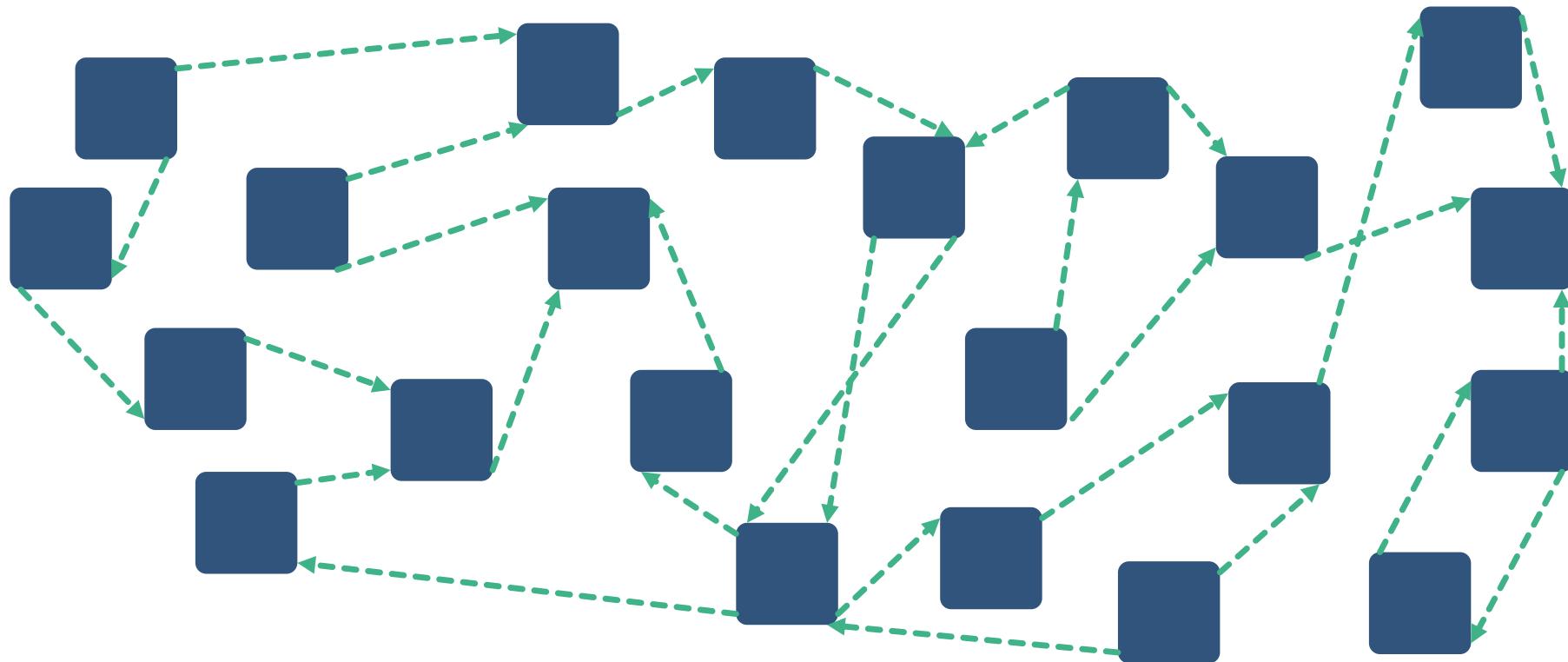


Gluten Free Oats Cycle Process for Blocks of Fields



Process Step	Sub Steps	Evidence & Type of File	Current Format & Potential Digitally Native Format
Field History		Field Records: Muddy Boots/Gate Keeper Record	On Screen or Paper Print Out CSV Export via API
Cultivating	Cultivate Sub Process Step 1 Cultivate Sub Process Step 2 Cultivate Sub Process Step 3 Cultivate Sub Process Step 1 Cultivate Sub Process Step 2 Cultivate Sub Process Step 3	Field Operations Records Muddy Boots/Gate Keeper Record	On Screen or Paper Print Out CSV Export via API
Drilling	Drilling Sub Process Step 1 Drilling Sub Process Step 1 Drilling Sub Process Step 2 Drilling Sub Process Step 2	Product Certificates, Product Specs, Cleaning Records: Packaging, Paper Records, Photos	Paper/Wrappers On Screen Photos Direct From Phones
Growing		Field Records, Product Specs, Application Rates & Reasons: Muddy Boots/Gate Keeper Record	On Screen or Paper PDF Print Out CSV Export via API

Directed Acyclic Graph – DAG



Supply chains/chains of custody don't work in linear order in real life.
Things go backwards and multiple things happen simultaneously.
We chose a platform with DAG architecture rather than blockchain.

Tech Demo // Case Study for Knowledge Transfer



<https://www.youtube.com/watch?v=LoPpDOyxFa0>

Demonstrated at Future Farming, video demo has had over 100 views.

Live PoC for impact

Attracted press coverage – 1 international via BBC, 1 National, 2 regional, 4 sector stories.

11th September

Scots farmers pioneer digital ‘gluten-free’ assurance chain

By Gordon Davidson



Scan me with
your phone's
camera!



Or go to:
<https://bit.ly/2LM38Ou>



Mureed Hussain MD MSc FBBA • 1st
Secretary of the British Blockchain Association | Editor, The JBBA
15m •

...

This is Huge.



Dr. Naseem Naqvi FRCP FBBA • 1st
President of The British Blockchain Association | Chair, Centre for Evidence ...
23m • Edited •

This is BIG.

Agriculture and Farming industry deploys PCIO framework of Evidence ...see more



PEER REVIEWED RESEARCH

OPEN ACCESS

ISSN Online: 2516-3957

ISSN Print: 2516-3949

[https://doi.org/10.31585/jbba-4-1-\(1\)2021](https://doi.org/10.31585/jbba-4-1-(1)2021)

Piece of Cake: Assuring Specific Qualities of Product in Farm Lifecycles with DLT - Can Evidenced Based Practice be supported by Participatory Action Research Methods?

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Received: 24 September 2020 Accepted: 16 October 2020 Published: 27 October 2020

Abstract:

A strong need for evidence-based practice in the blockchain and distributed ledger technology (DLT) research, development and action domains is currently clarifying. Literature highlights a lack of transparency around the outputs, outcomes and impacts of blockchain projects. As previously cited in this journal for example, the US Agency for International Development studied 43 projects, and found that nearly all did not want to share their results [1]. The Centre for Evidence-Based Blockchain recently completed a study of 517 companies to see if their blockchain projects could be defined as evidence-based practice. Over four years they measured companies

<https://jbba.scholasticahq.com/article/17845-piece-of-cake-assuring-specific-qualities-of-product-in-farm-lifecycles-with-dlt-can-evidenced-based-practice-be-supported-by-participatory-action-research-methods>

Future Developments



- IoT – sensors, APIs, Apps
- Extend to whole supply chain
- AI
- Robotics
- Sustainability

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Re-establishing Trust in Data

