From precision livestock management to SMART livestock farming

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#LIVEXchange22

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Keeping it real- it's in our DNA!

Global Digital Farm
Demonstration site

SMART Farms- from a concept in 2005...

…to (partial) reality………….

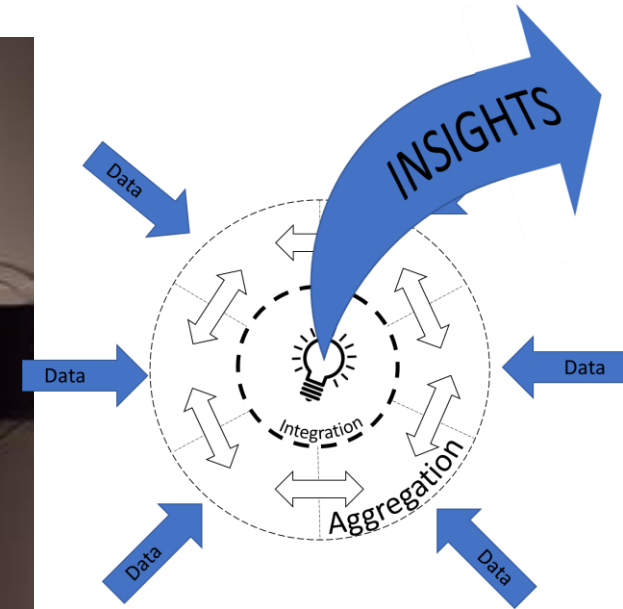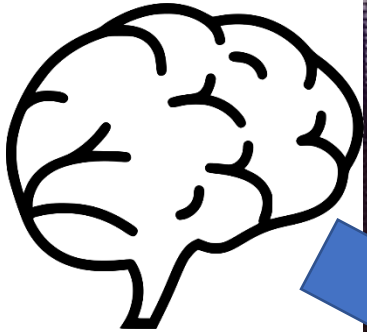Eg Potato producer- 750 pivots, 220 pumps, manned 24/7, >half M litres/minute in flow

@ProduceSolution

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...to (partial) reality............

Eg Potato producer- 750 pivots, 220 pumps, manned 24/7, >half M litres/minute in flow

@ProduceSolution

INSIGHTS

Data

Integration

Aggregation

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The fundamental stuff!!

Derek Schneider, Willoh via Brewarrina, NSW

The fundamental stuff!!

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The fundamental stuff!!

Derek Schneider, Willoh via Brewarrina, NSW

Precision Livestock Management- a WIP
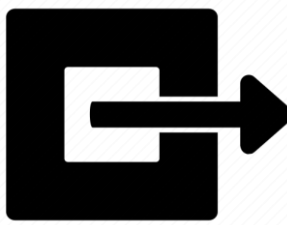
In the beginning (2000-2010)…

Mean yield 3 t/Ha

Legend
Yield 96-99

≤0.5 t/Ha

4.0 t/Ha

≥8.0 t/Ha

Mean DSE 13/Ha

Camp area

Frequently used areas of the paddock

Areas of the paddock rarely used by cattle

Water trough

Stocking Rate
DSE/Hectare
- 0
- 1 - 5
- 6 - 20
- 21 - 50
- 51 - 250

0   125   250   500 Metres
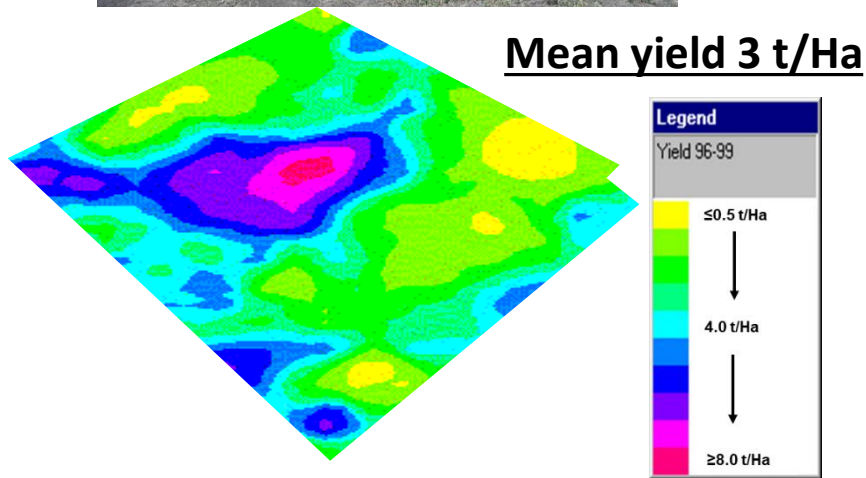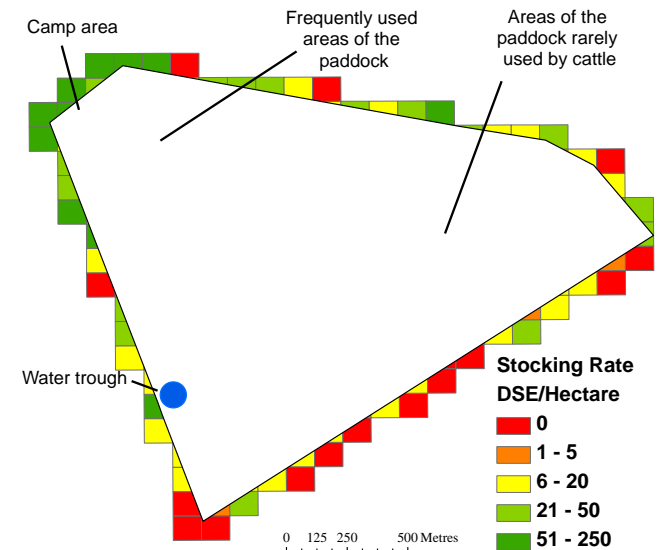
$$LRI_x = \frac{\sum_x Raw\ point\ count}{\sum_n \sum_x Raw\ point\ count}$$

$$DSE_x = LRI_x * Total\ DSE$$

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Kick starting the livestock sector…

NSW GOVERNMENT | Trade & Investment

2015:

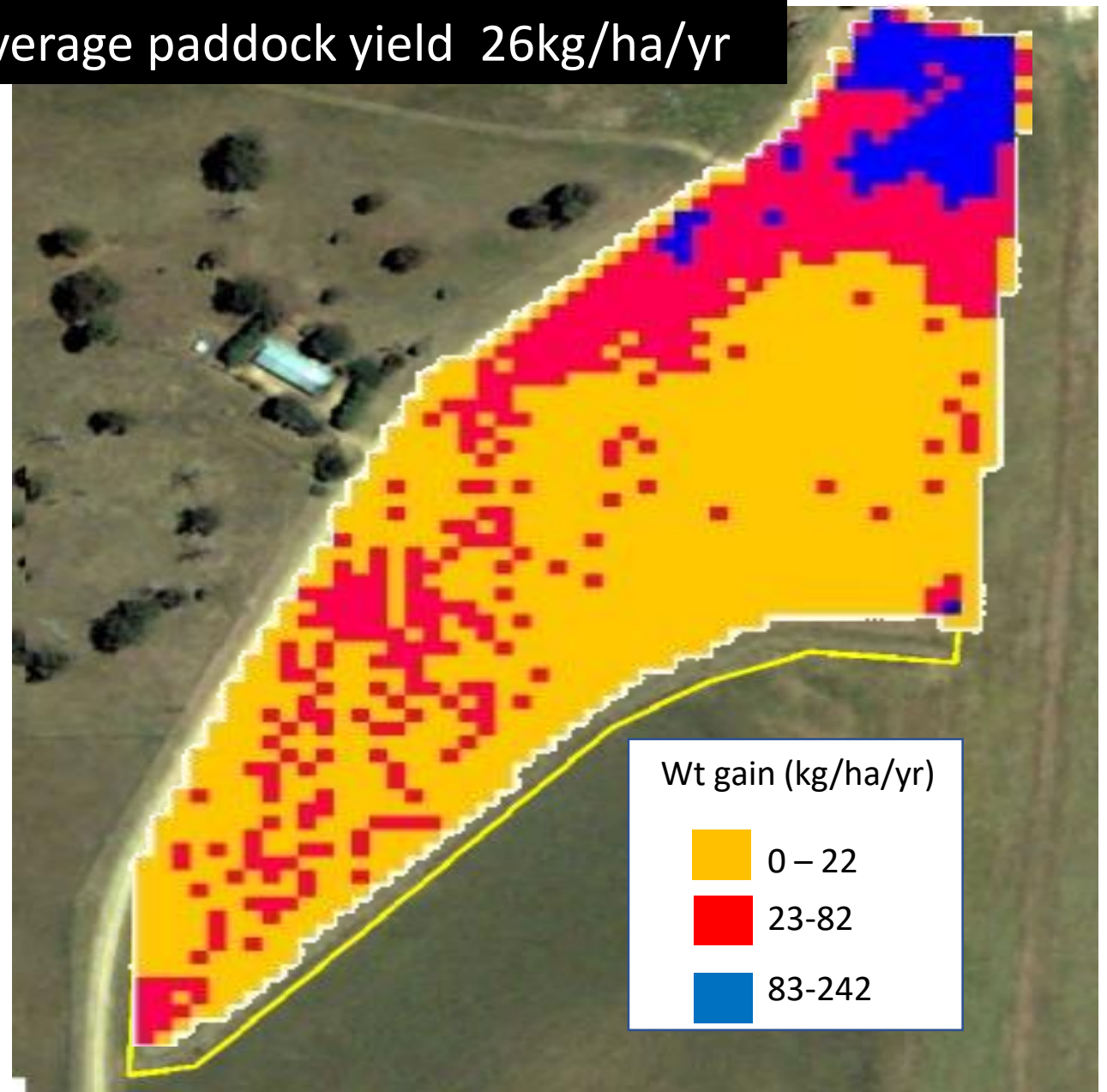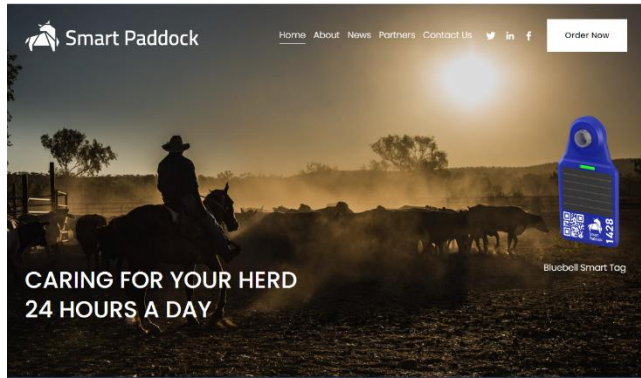*Is this the worlds first livestock yield map ?*

DSE map → Yield map → Gross margin map

Inputs-
Fert
Seed…

Average paddock yield 26kg/ha/yr
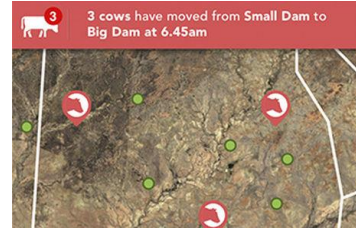
Wt gain (kg/ha/yr)

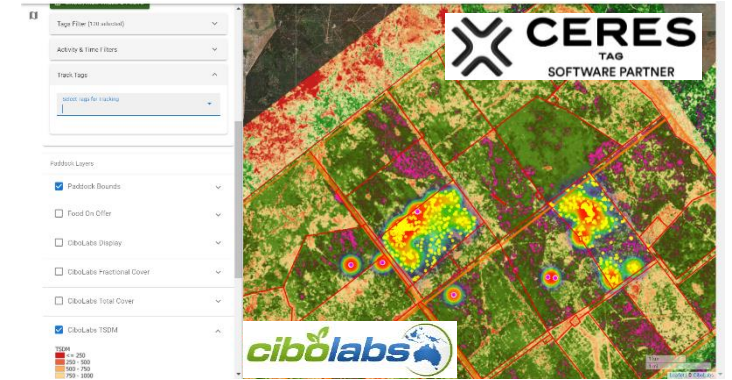|	
🟧	0 – 22
🟥	23-82
🟦	83-242

Increasing on-farm options

Smartpaddock.com

moovement.com.au

Cerestag.com

LoRA   3G/4G/Sat

LoRA   3G/4G/Sat

LEO sat

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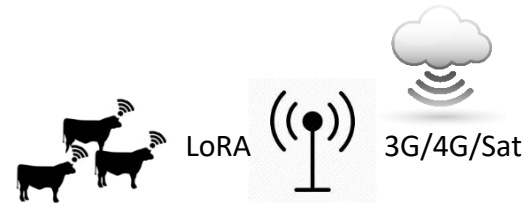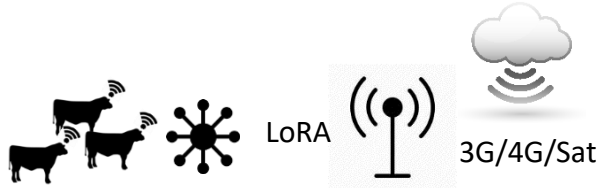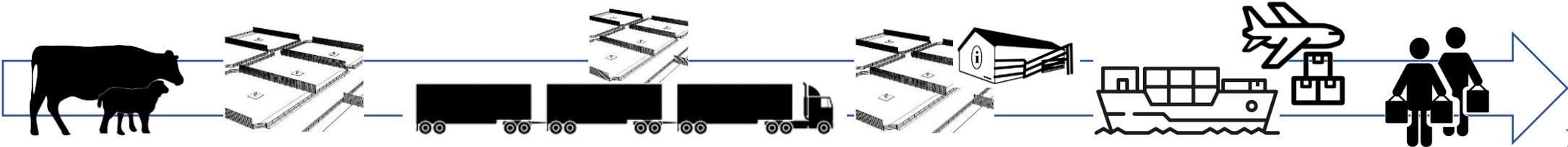
SMART farming extends beyond the farm gate

I was asked to keep it real…

Strengthening Foundations…

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SMART farming extends beyond the farm gate

I was asked to keep it real…..BUT…

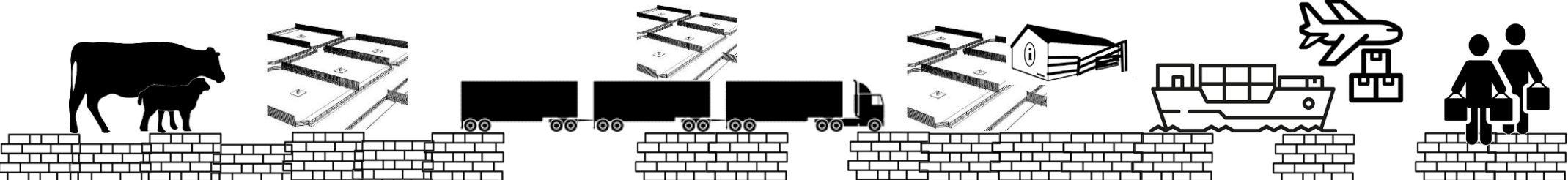ESG/Emissions incl. Scope 1, 2, 3 reporting….

Traceability- food safety, market access, provenance

Biosecurity

ESCAS

Strengthening Foundations…
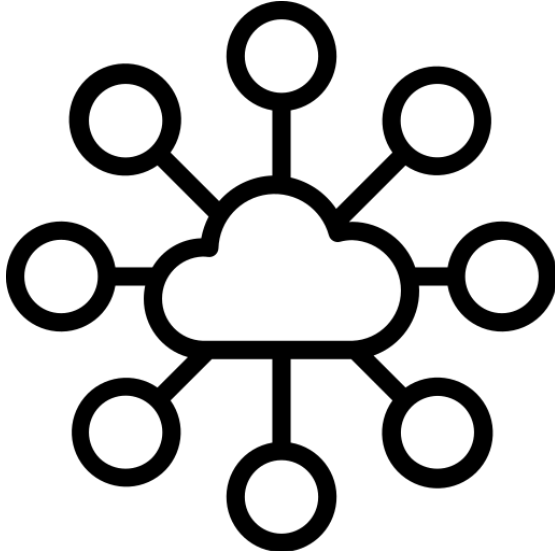
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SMART farming extends beyond the farm gate

I was asked to keep it real…..BUT…

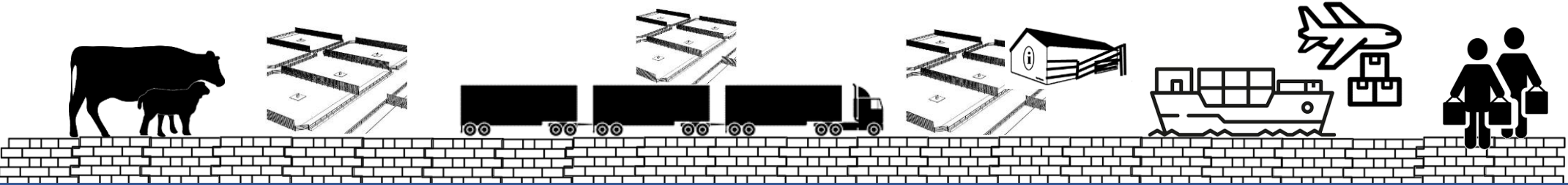…the art of the possible (= science of the plausible)

SMART farming extends beyond the farm gate
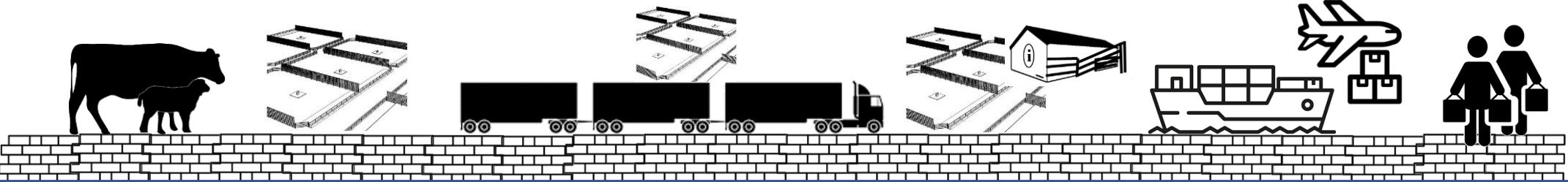
Joining the dots IS technically FEASIBLE

= Joining the data !!

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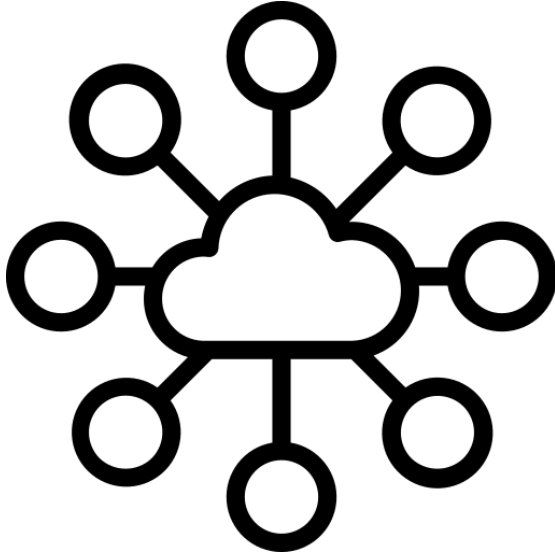
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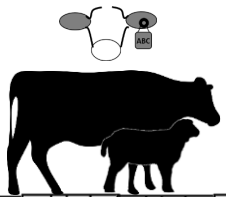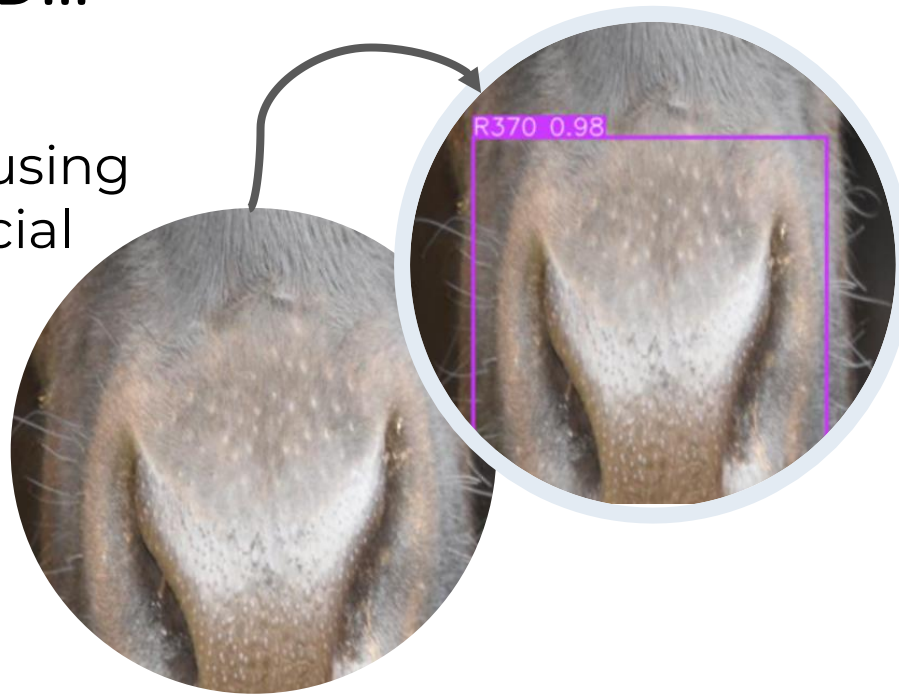
When it comes to IoT, livestock are the THING!

...to compliment NLIS/VID...

ID Trakka Research
Cattle Muzzle Identification using just a smartphone and Artificial Intelligence.

TerraCipher Integrity Systems Charles Sturt University

Courtesy Dave and Will Swain, terracipher.com\

Key enablers

-> NLIS readiness

SenseHub® FEEDLOT

Allflex® Livestock Intelligence™

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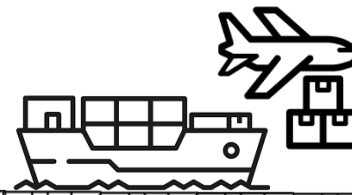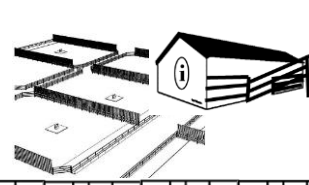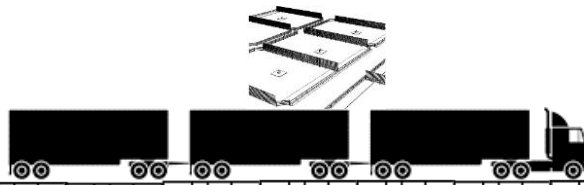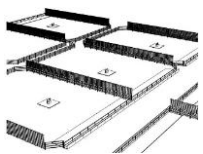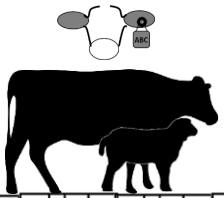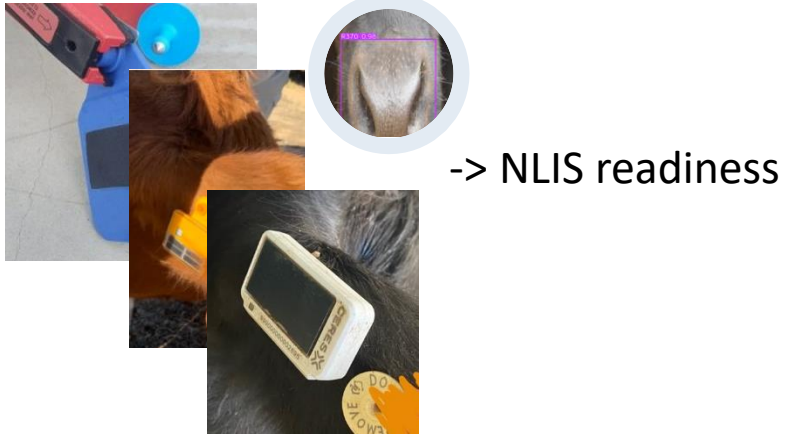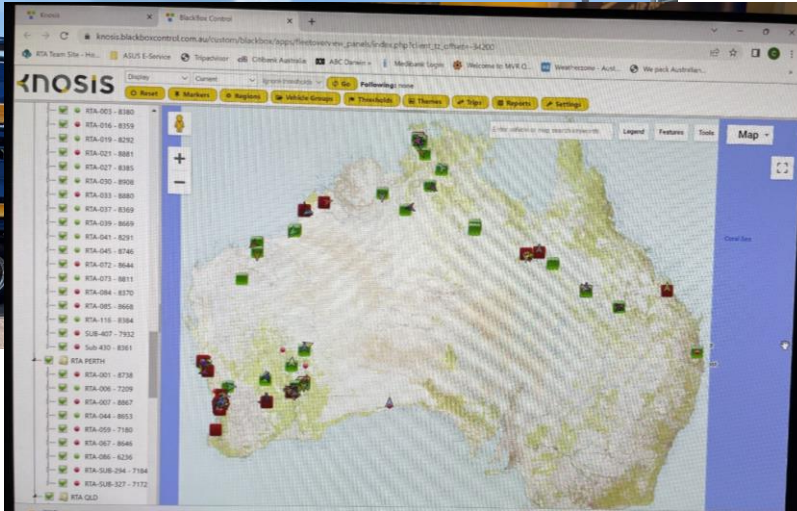
Key enablers

High-flow panel reader/crate

LEO satellite/4G

60 hd (B-double)
16 chars (NLIS) = 6-8 bytes
> => 1-2 tags per 20 byte LEO satellite msg
> => full load per 1600 byte 4G/5G NBIoT msg
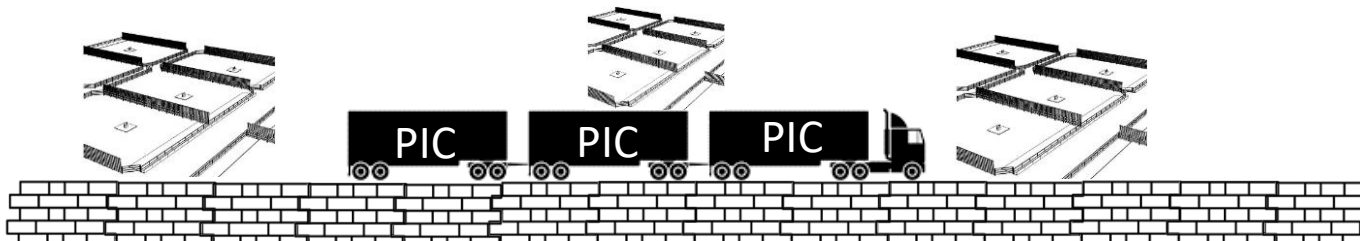
Key enabler: Monitoring systems
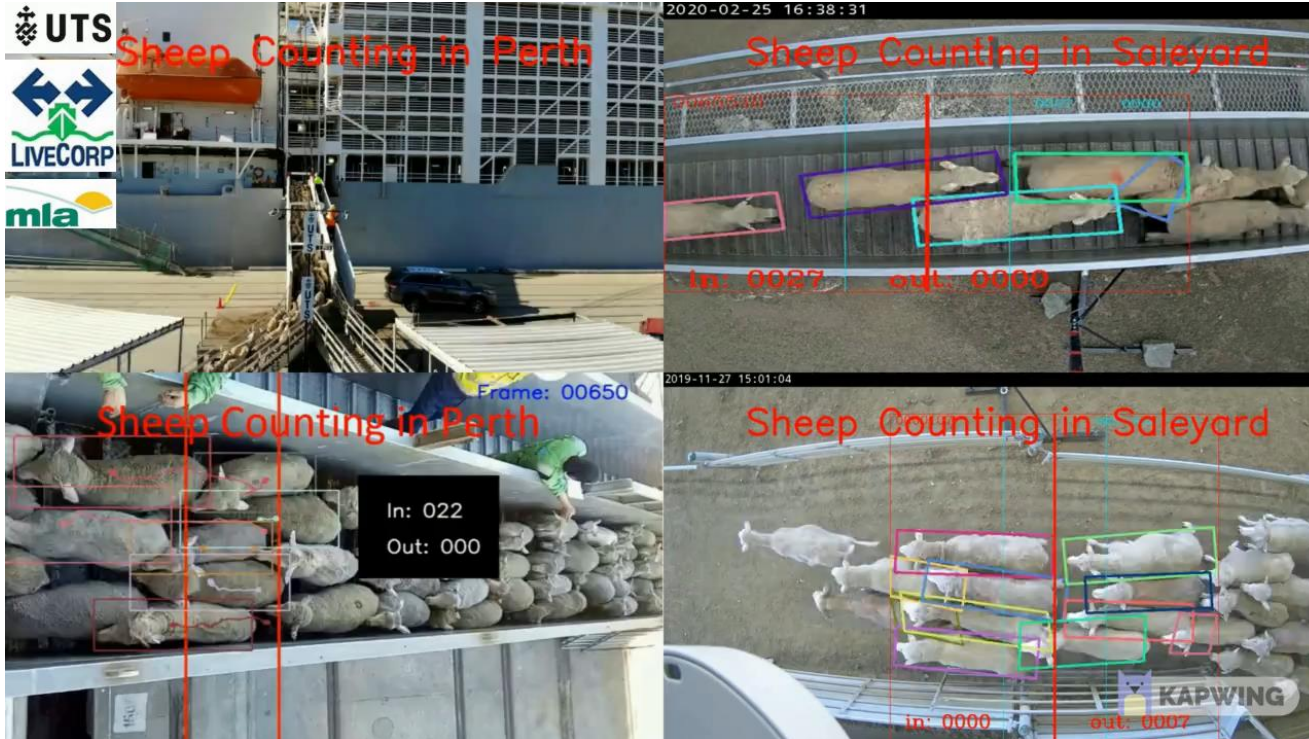
Jian Zhang et al., 2022
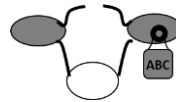
Schneider et al., 2017

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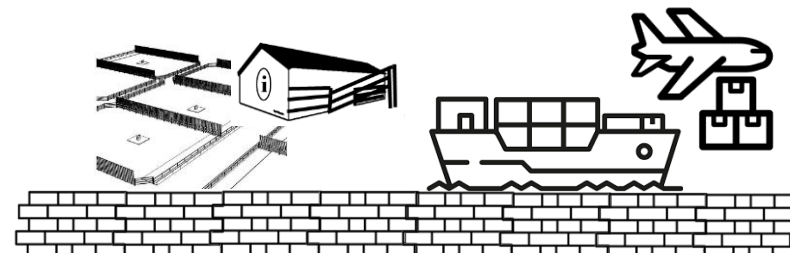
Key enabler: Telecommunications

Vessel network connectivity trial (Connectivity 2.0)
= on-board Wireless mesh networks

X ~11,000

Ref: Dehumidification Research Trial Grant:
Final Report Part 2 – Vessel Network Connectivity Trial, August 2021

Ocean Jillaroo

Critical design elements:
Water, Feed, Air, Stability,
Intra-ship telecomms/data ecosystem!!
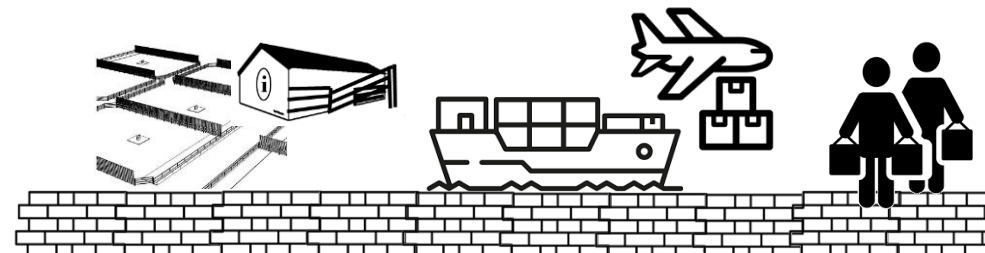
Key enabler: A data revolution...

A Real-time Data Sharing Infrastructure **Must**

1. Be producer centric.
By putting producers directly in control of their data.

2. Standardise the data.
So everyone is speaking the same language.

3. Connect with anyone.
Regardless of the technology they use.

Courtesy Dave and Will Swain, terracipher.com

Key enabler: A data revolution...

The Importance of Standardisation and Reliability for DATA DISTRIBUTION (NOT aggregation)

Everyone must be speaking the same language* to share data between each other.

*AND data distribution relies on robust object (eg animal) ID systems.

Message Structure Standardised

Service Provider 1 → → Service Provider 2

Key enabler: A data sharing platform

Courtesy Dave and Will Swain, terracipher.com
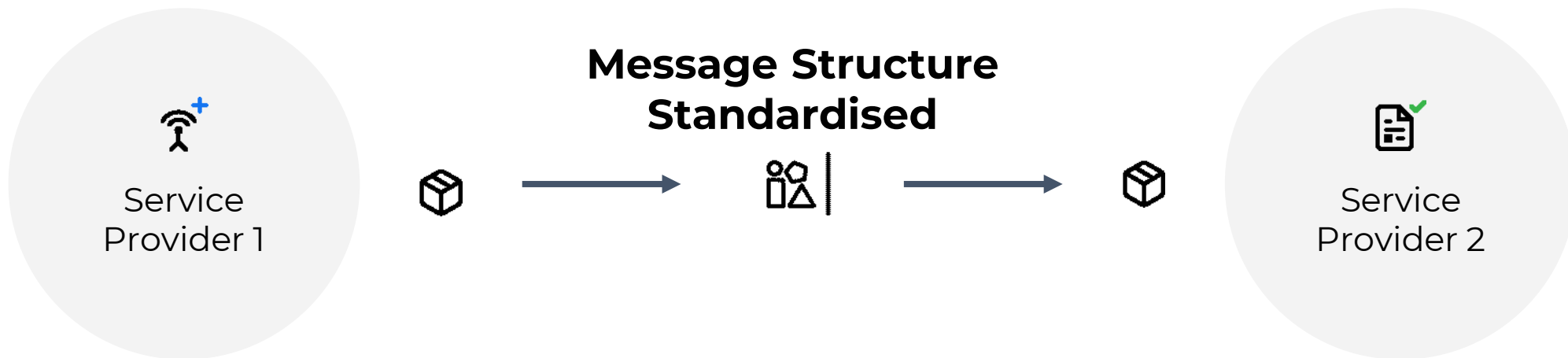
Key enabler: A data sharing platform

Control = Ownership

Giving Farmers Control

✳ **If you'd like to join our trial:**
info@terrcipher.com

Service Provider 1 → → Service Provider 2

Courtesy Dave and Will Swain, terracipher.com
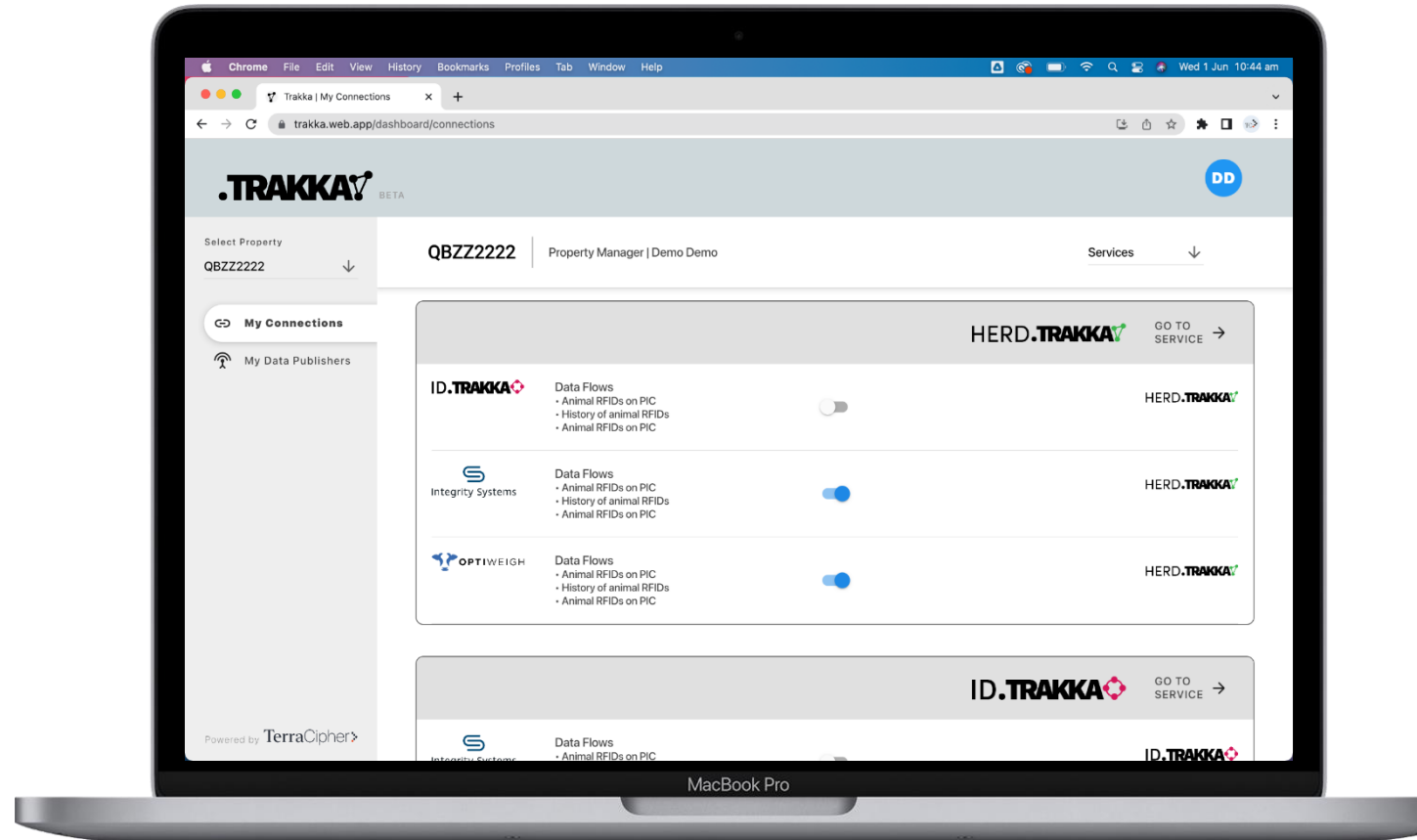
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Joining many of the dots IS technically FEASIBLE
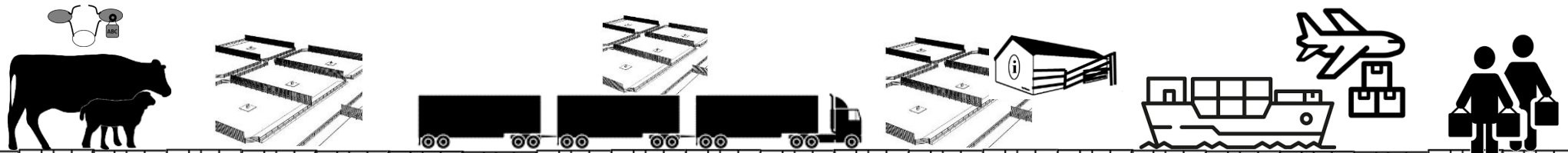
SMART farming extends beyond the farm gate

Joining some of the dots IS technically FEASIBLE

But is it HUMANLY possible?

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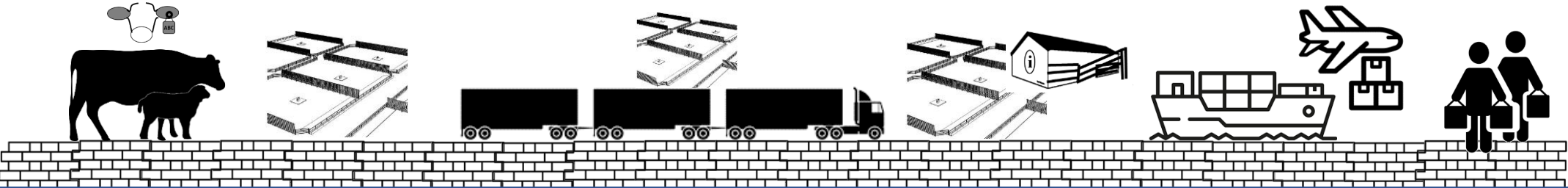Yes- if we put our heads together!

Yes- if we put our heads together!

- Utilise expanding cohort of *'hard-yarders'!*

Vic IOT trials, NSW Farms of Future program, Qld Agtech hubs, PIRSA Agtech demo sites, (NT) Digital Territory, Agtech Innovation WA

Yes- if we put our heads together!

- Utilise expanding cohort of *'hard-yarders'*!

Vic IOT trials, NSW Farms of Future program, Qld Agtech hubs, PIRSA Agtech demo sites, (NT) Digital Territory, Agtech Innovation WA

- Be a *'trialer'*-
  "Ive learned more from what didn't work than what did"

THANK-YOU

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