



NTNU



SEAFOOD TRACING



TRACE4EU
CONSORTIUM

Norwegian Seafood Traceability using EBSI Blockchain

Helping the Norwegian fishing industry to enhance product traceability, food safety, and combat illegal fishing

Seafood Industry in Norway

100.915 Km of Coastline including all islands

2nd largest exporter of seafood

2,7 mn tonnes

Export volume for last 12
month

170 bn Kroners

Export value for last 12
months

1,2 bn Kroners

King Crab with volume 2500
tonnes

USA, France, UK are main customers of Norwegian seafood

US, Vietnam and Hongkong are largest market for Norwegian King Crabs

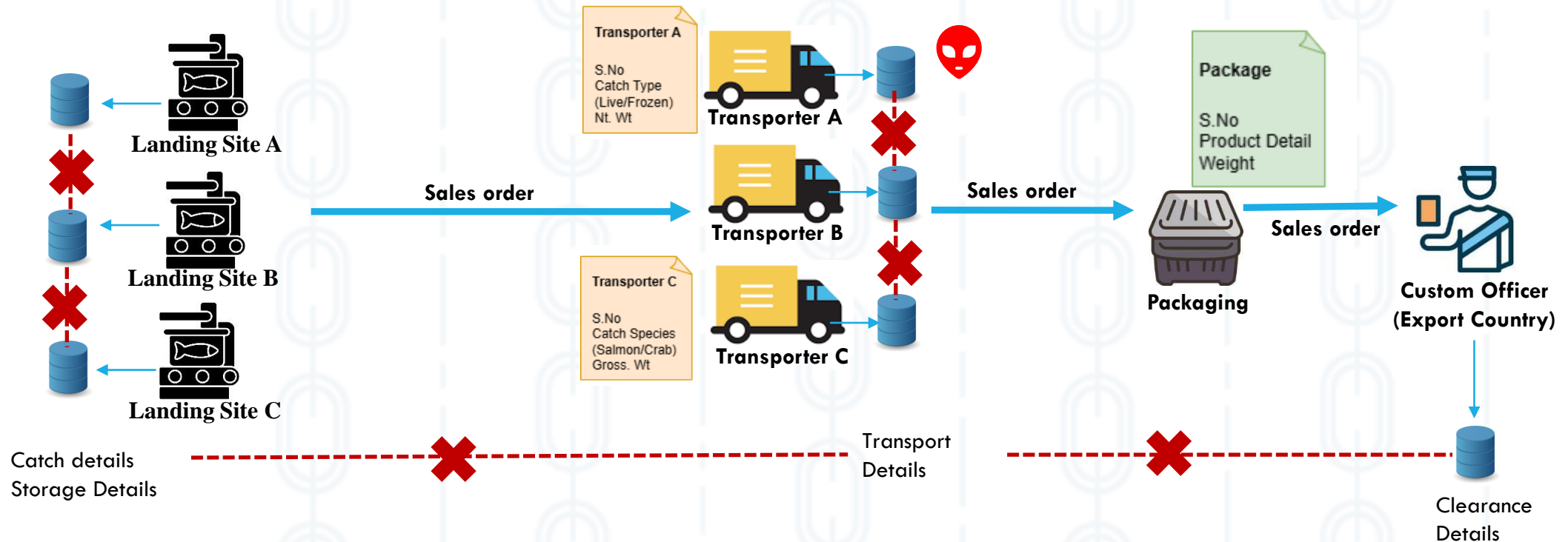
Challenges

Data Silos : Each entity maintain its own database, without data interoperability mechanism

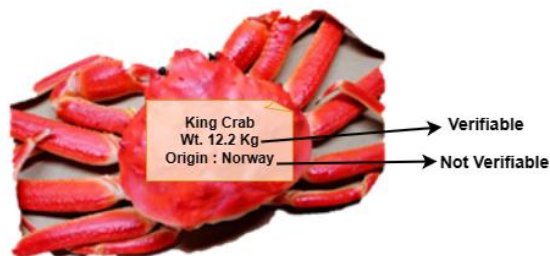
Data Integrity

Lack of Standardization : No standard record keeping mechanism

Manual data entry



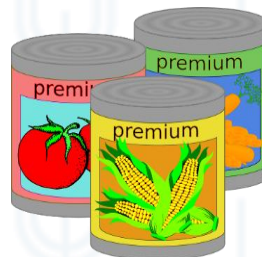
Consequences



No traceability of product

Increased Risk of Illegal, Unreported, and Unregulated (IUU) Fishing

Difficulty in addressing food frauds

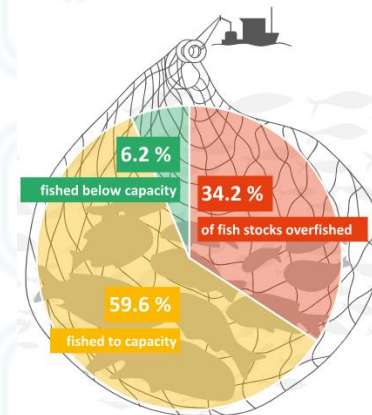


Operational Inefficiencies

Mislabelling

False claims

Induce lack of trust for end customer



Inaccurate Data

Inefficient Inventory Management

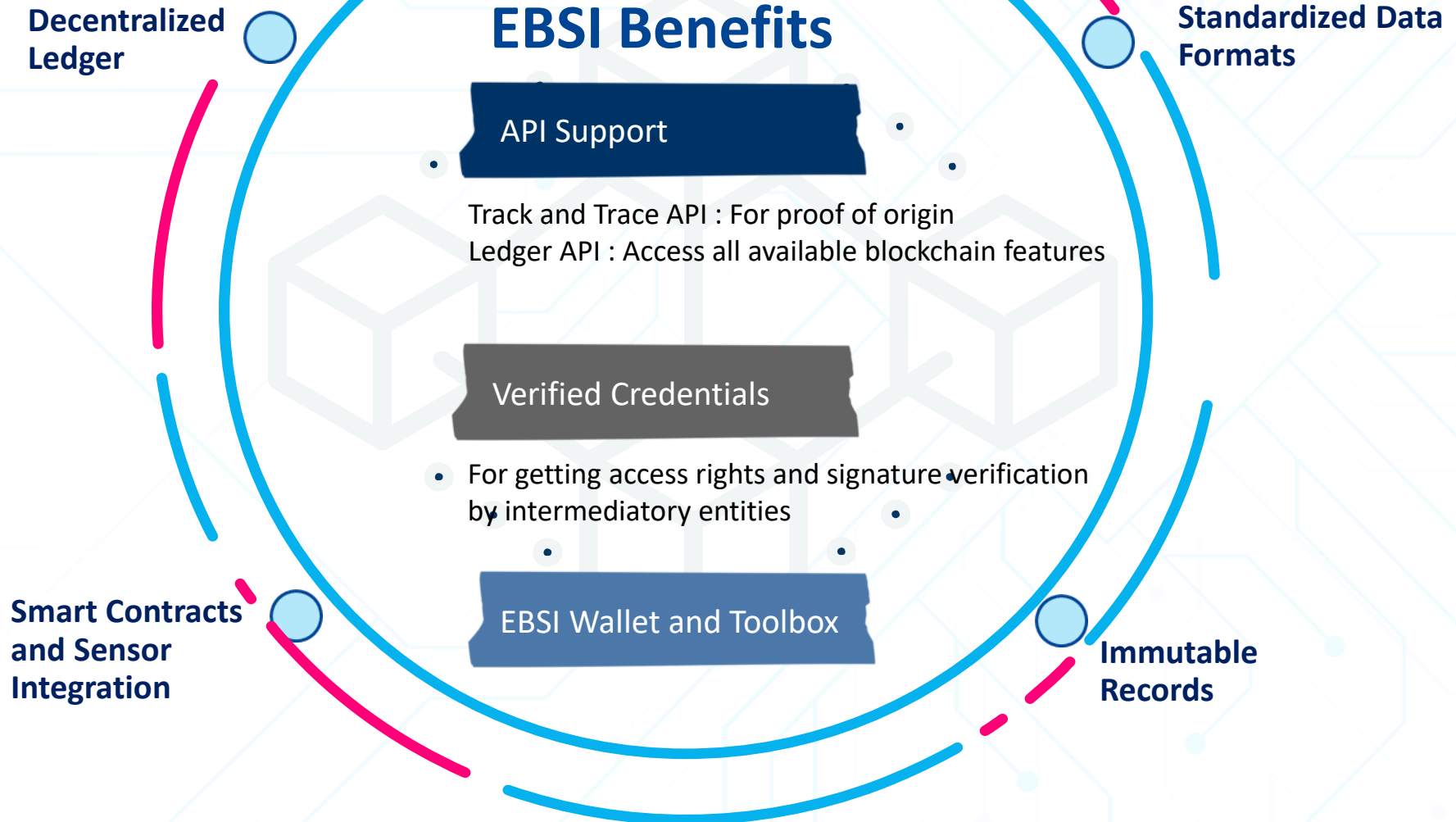
Compromised sustainability efforts

EUR 91 million worth of counterfeit and substandard food seized in Europe-wide operation- Operation OPSON 2024

Europol received reports from 26 countries that almost 27.000 tonnes of fake food had been seized. (Dec 2021-May 2022)

A number of Product Tampering, Record Tampering is recorded in 2024 Report on EU AGRI-FOOD Fraud Suspicions

Why Blockchain



The Project

Objective

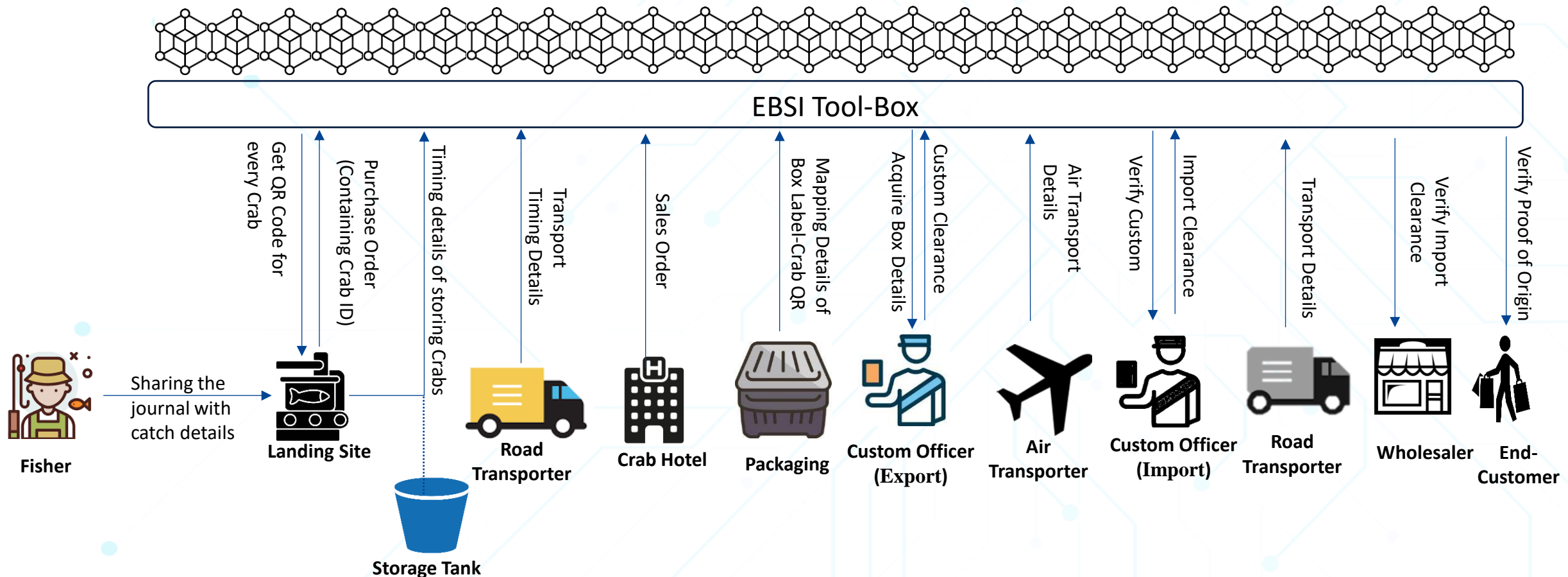
A blockchain based system to create a transparent and verifiable seafood supply chain.

Enables

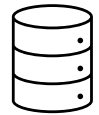
Track every seafood product's journey, with a complete and tamper-proof record.

Impact

Empower consumers & promote sustainable practices for a healthier future.



Important Consideration while Adopting Blockchain Technology



Database Design

Use blockchain for storing proof, not as primary data source



Integration

Integration with legacy system
Data format compatibility



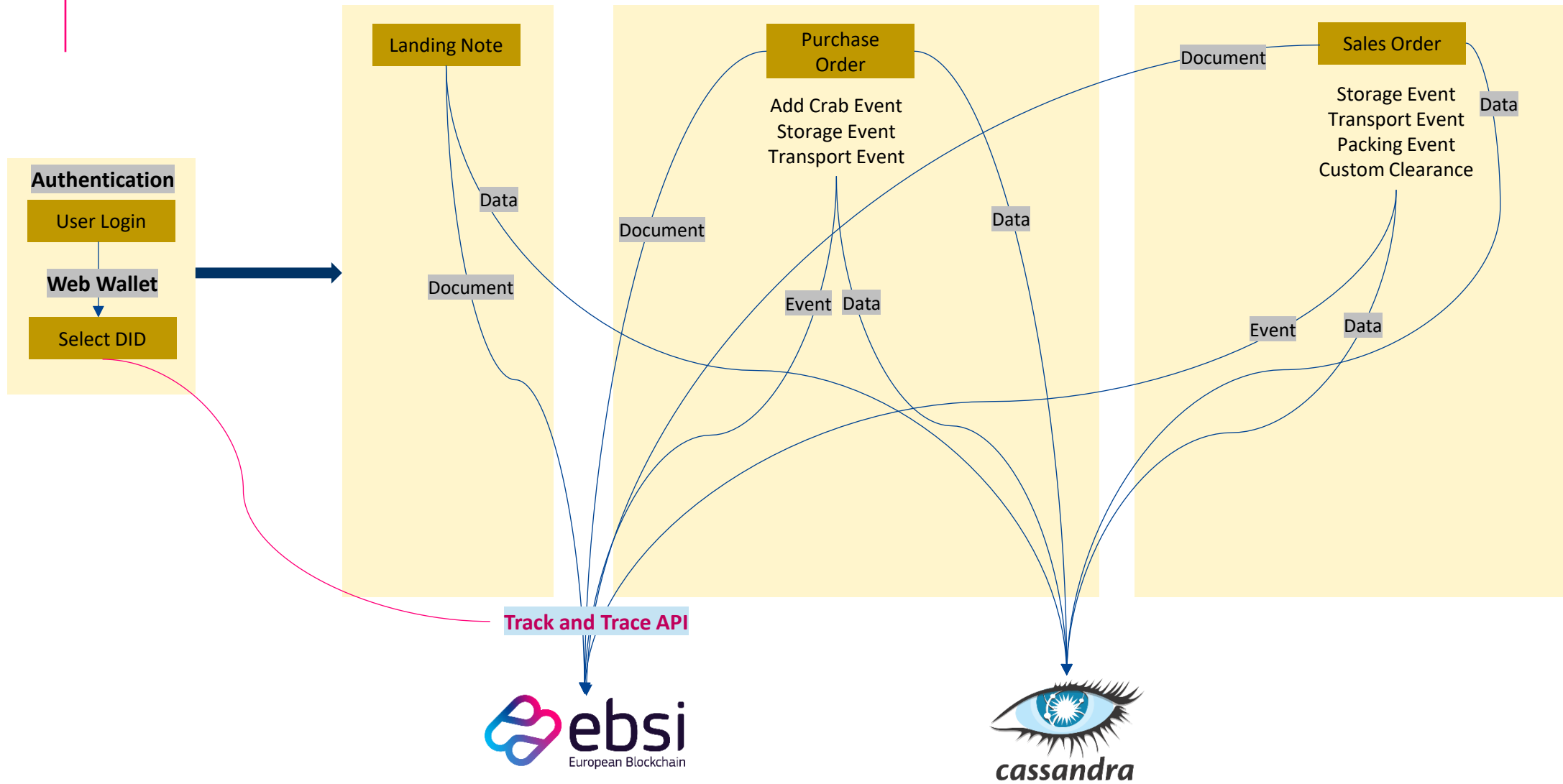
Privacy

Data privacy regulations
Access control mechanism
Sensitive business data

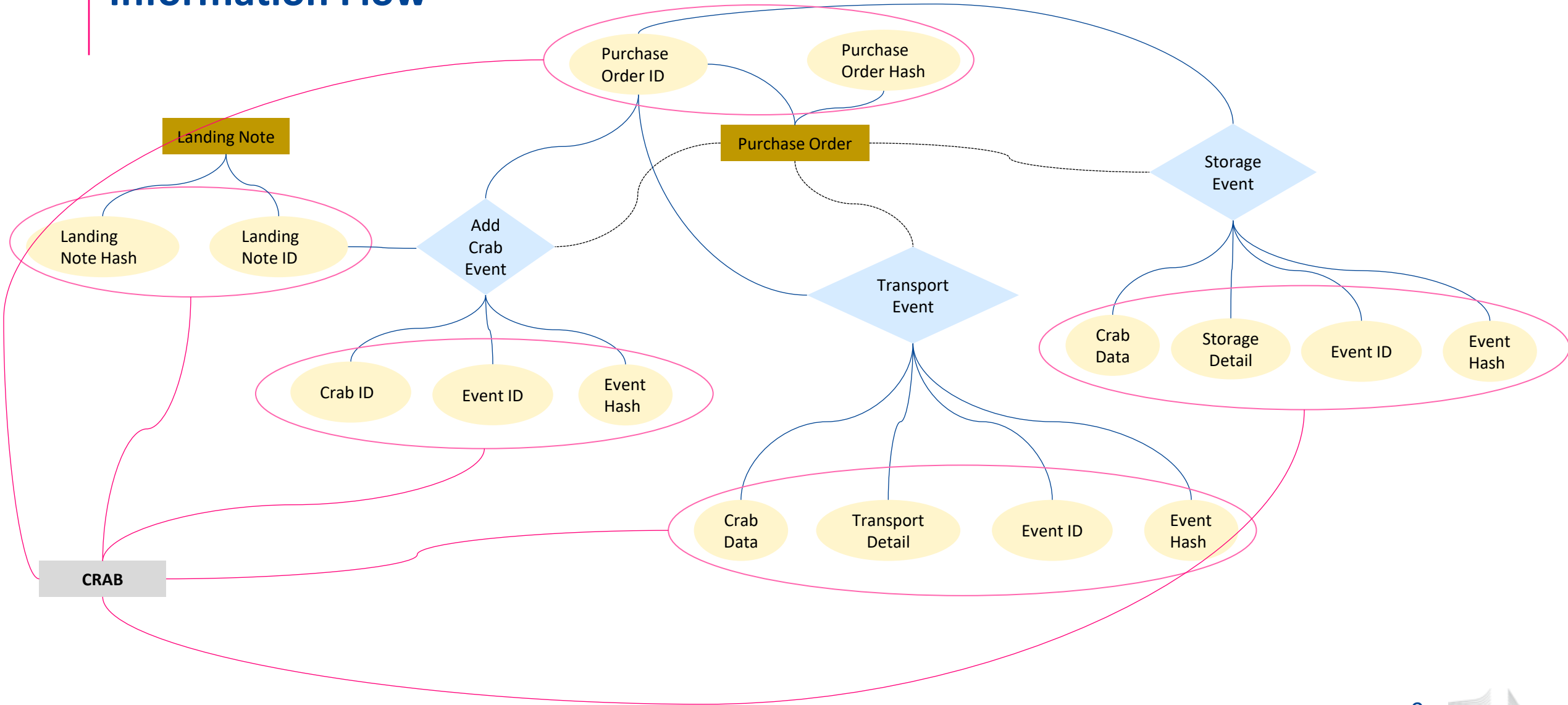
Other considerations

- Infrastructure setup costs
- Operational Costs
- Training of users
- Consortium management
- Energy Consumption

Workflow



Information Flow



Implementation Instance

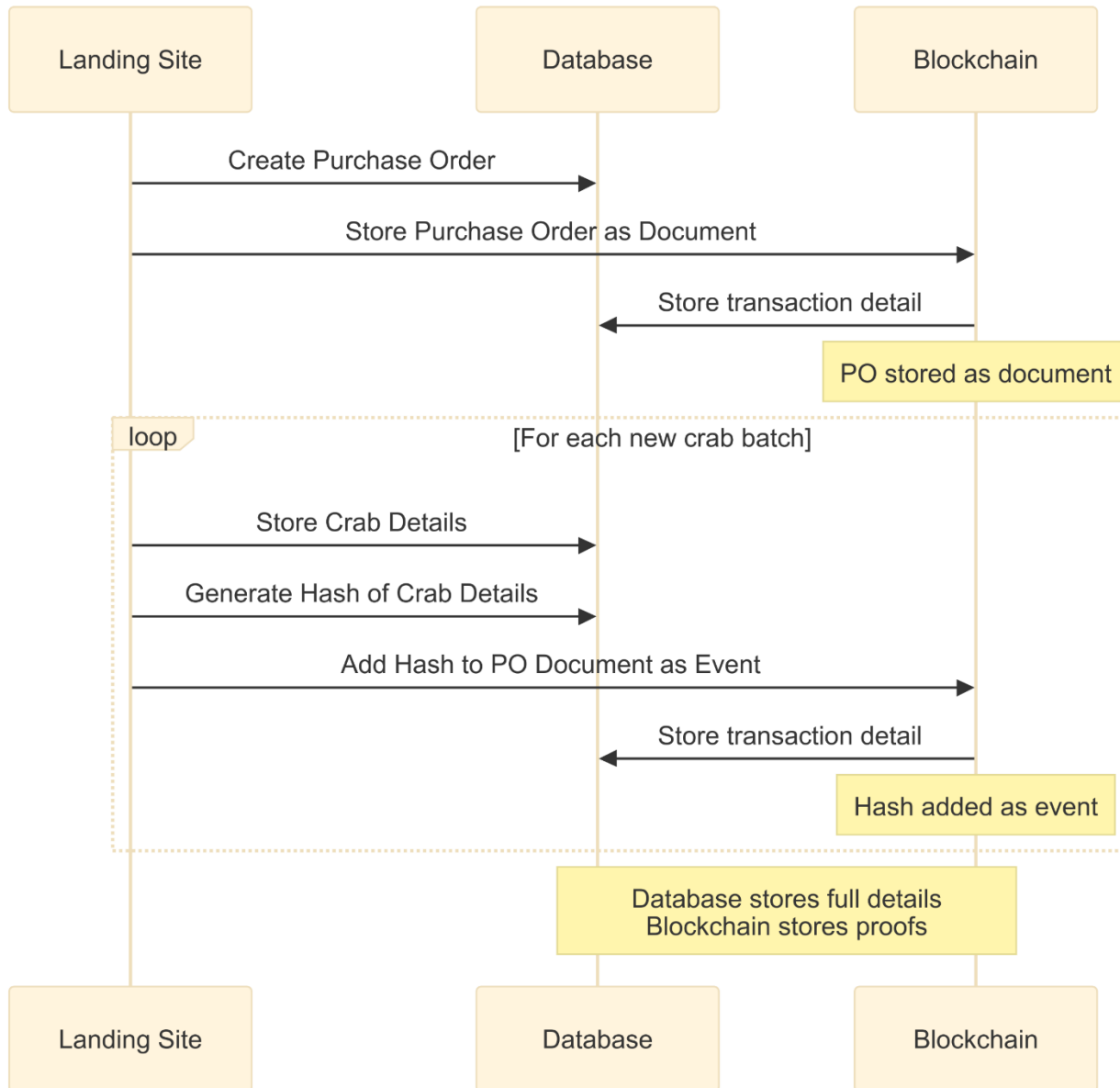


Table PO

po_id
po_hash
trans_detail
event_detail
....

Record event_detail

```

{
  add_1 :
    { crab_id1 :crab_weight1,
      crab_id2: crab_weight2,
      .....
      event_hash: event_hash_value
      trans: trans_detail
    }
}
  
```

Working Example

Landing Note

Landing Note ID : 27a4a6fd-67ee-409b-94c1-21b5e97da009

Landing Site ID : Site_2

Catch Date From : 2024-11-04

Catch Date To : 2024-11-17

Catch Area : Trondheim Sea Sector 1

Amount of crab : 5

Landing Note Hash :

0x5870b3af5c8bf6de26c4056d8530c31b8d7697119f83a1dafd4e5733e1e5f892

Purchase Order

PO ID: 4613eeaa-5421-4a52-b9e8-172b4ad173b6

PO Hash :

0x1228df7bcfffa5f3e6ea0c05cba5d2c6e3de6f9d9f4dabc6ea686f06b17e6f5d

Add Crab Event:

Event ID:

0xd0ba190ad6432249af934a34a369136d5cb9adbac686abc8d07170745443047

Sender : did:ebsi:xxxx

Metadata: crab_id, crab_weight, landing_note_id, arrival_time

Storage Event

Event ID:

0xc16d4359f222f409333f6ce284d1e0f353dbda9f797fc0ab4c2fd70dd2be1a6c

Sender: did:ebsi:yyyy

Metadata: tank_id, crab_id



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