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CoolFish 

 NTNU

# Deling av data og informasjon i norske fiskerier – et bærekraftsperspektiv

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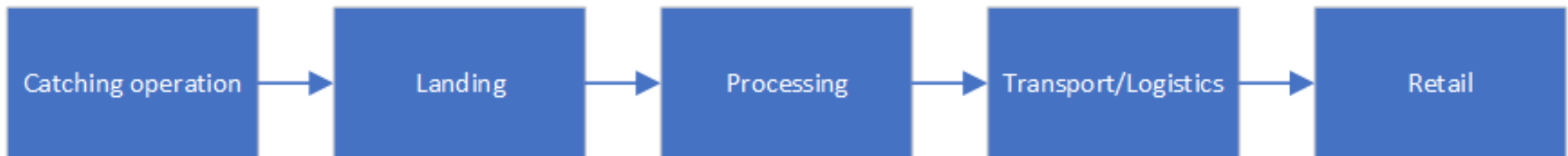
15.11.2021



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# Traceability in the Norwegian fisheries sector

- Whitefish and pelagic fish
- Based on literature reviews
- Company interviews
- Map the current practice of data capture and information sharing in Norwegian fisheries
- Industry practice of recording and sharing sustainability information

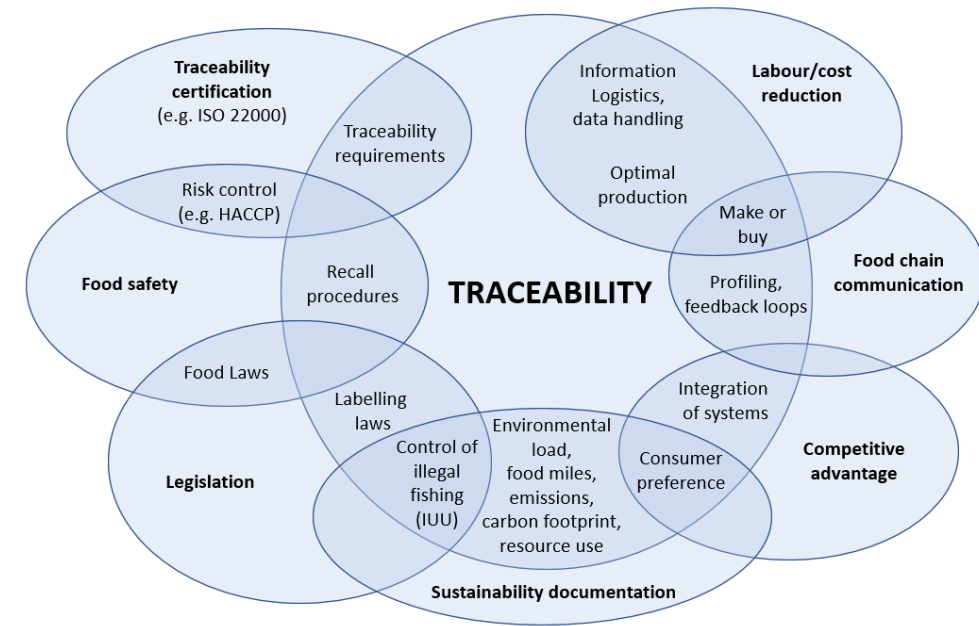




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# Food traceability

- Traceability
  - The ability "to trace"
  - ISO 8402: "The ability to trace the history, application or location of an entity by means of recorded identifications"
    - Origin of product (including ingredients and raw materials)
    - Process history
    - Location and date & time for every step in the supply chain
  - Internal traceability
  - External traceability
- Drivers for traceability in food supply chains
  - Food safety
  - Consumer demand
  - Food fraud – reduce illegal, unreported and unregulated fishing (IUU)
    - 36% of all seafood products are mislabelled (The Guardian, 2021)
  - Legislations
    - One-up one-down
  - Sustainability
  - Profits and increased market value



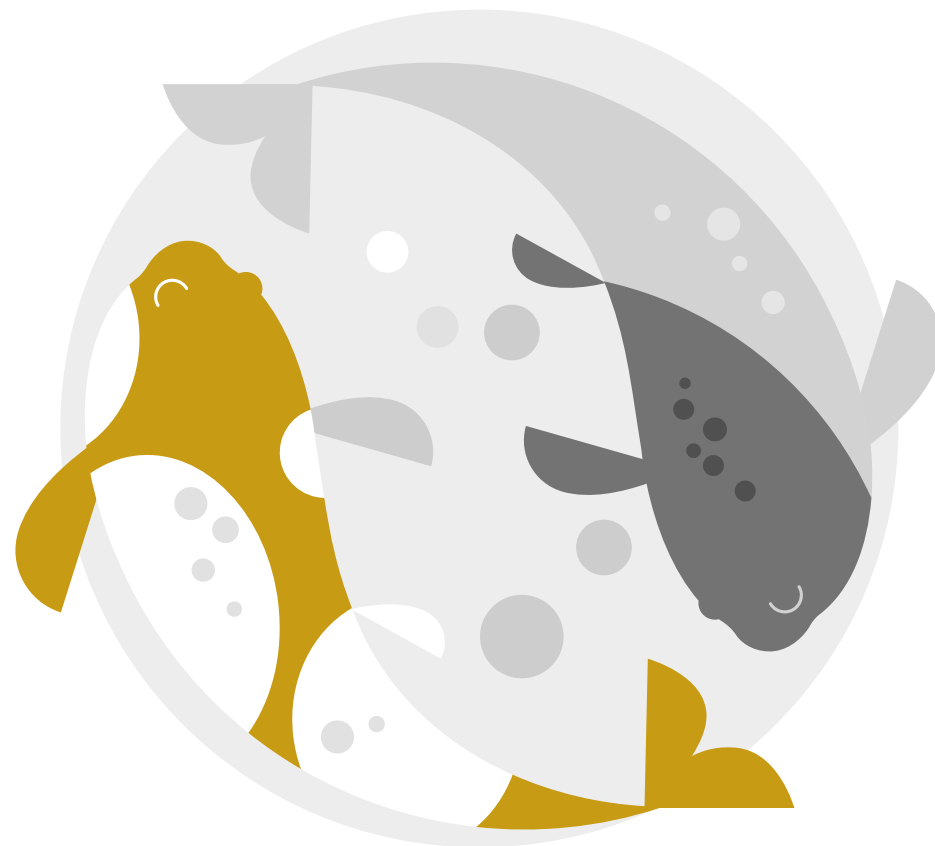
Traceability drivers in the food sector, adapted from (OECD and FAO, 2009)



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# Traceability and sustainability

- Sustainability
  - "Meeting our own needs without compromising the ability of future generations to meet their own needs"
  - The environment, the society and the economy
- Food traceability systems are necessary to **record, analyse, and communicate** sustainability information
  - Carbon footprint, working conditions, sustainable fish stocks etc.





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# What are food traceability systems (FTS)?

- Tool to record and communicate information about the product itself
  1. Identifying traceable units
    - Example: single fish, pallet of fish, fish product sold at retail
  2. Documenting transformations of traceable units
    - From a fish to a pallet or bag of fish to a fish product
  3. Recording data and information



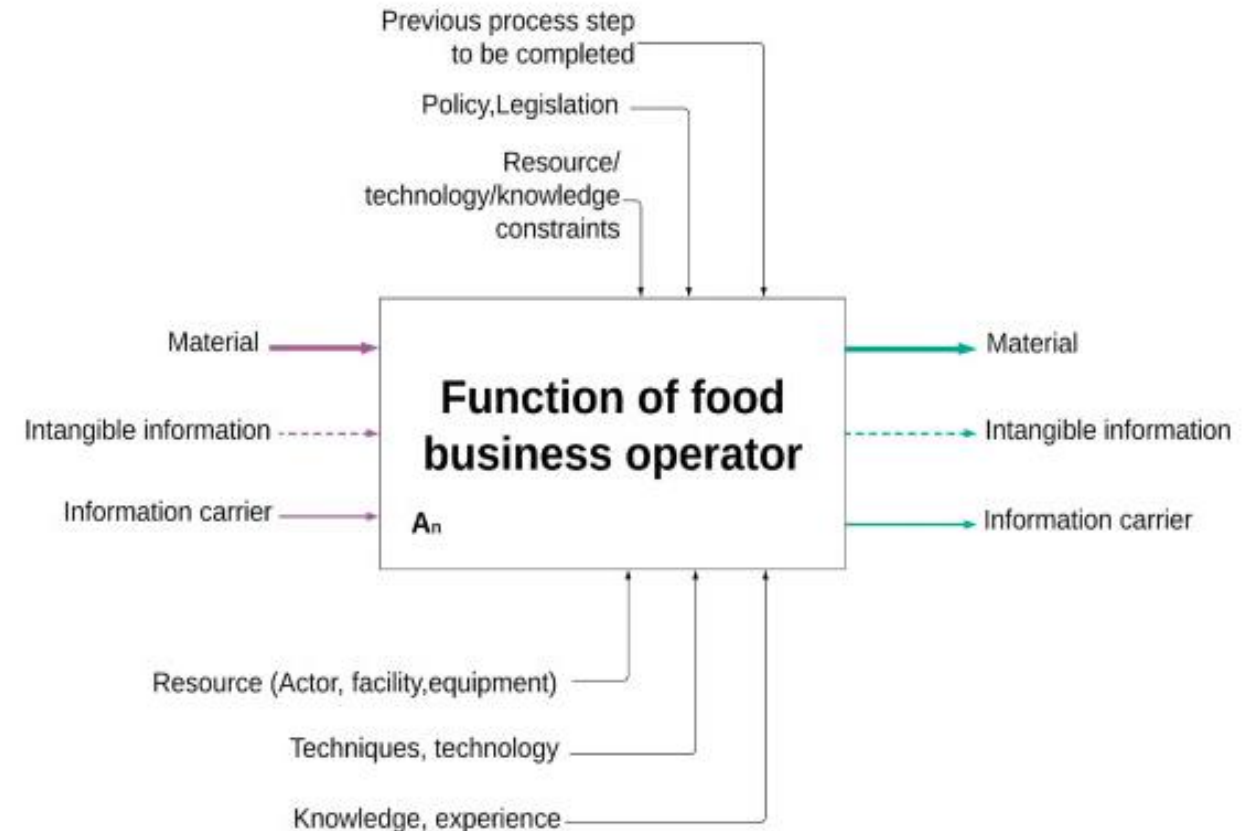
# Information attributes in captured fish supply chain

- Species Common Name
- Species Scientific Name
- Location/Catch Area Common Name
- Location/Catch Area FAO Map Number
- Location/Catch Area Latitude
- Location/Catch Area Longitude
- Landing location
- Receiving station name/ID
- Date of Catch/Date of Sailing
- Date of landing
- Vessel Type
- Vessel Name
- Vessel Unique ID/Call Sign
- Vessel Flag State
- Gear Type
- Fishing Method
- On board storage method
- Producer Information
- Production location
- Business name/ID
- Date of Production
- Date of durability
- Date of shipment
- Type of product
- Preservation/processing method
- Storage
- Storage method
- Unit Weight
- Packaging
- Method of packaging
- Labelling scheme
- Eco-label scheme
- ...

# Visualisation of Food Traceability systems

## - MIFMT (Material and information flow modelling technique) diagrams

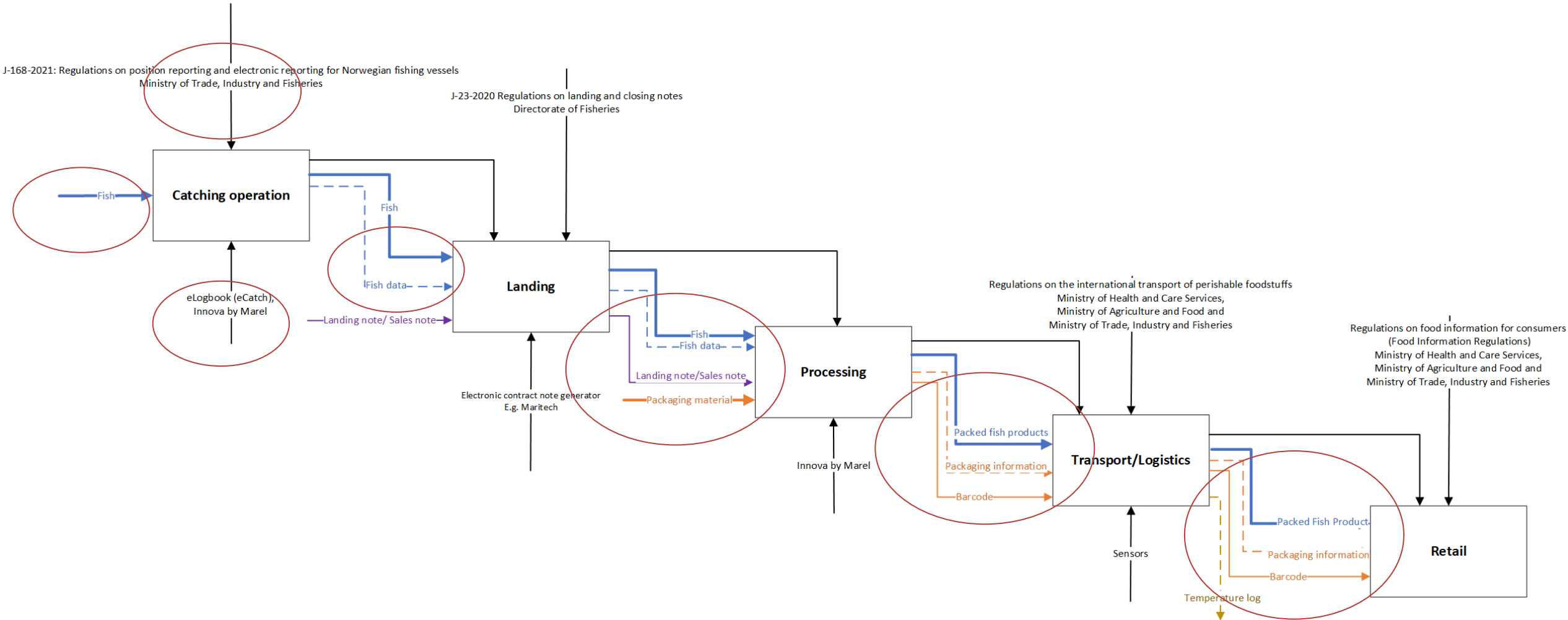
- Function (boxes): Food business operator in 0-level
  - Every function box can be decomposed into lower-level diagram i.e. the internal traceability system
- Input: material, intangible information and information carriers
- Output: material, intangible information and information carriers
- Mechanisms
- Control





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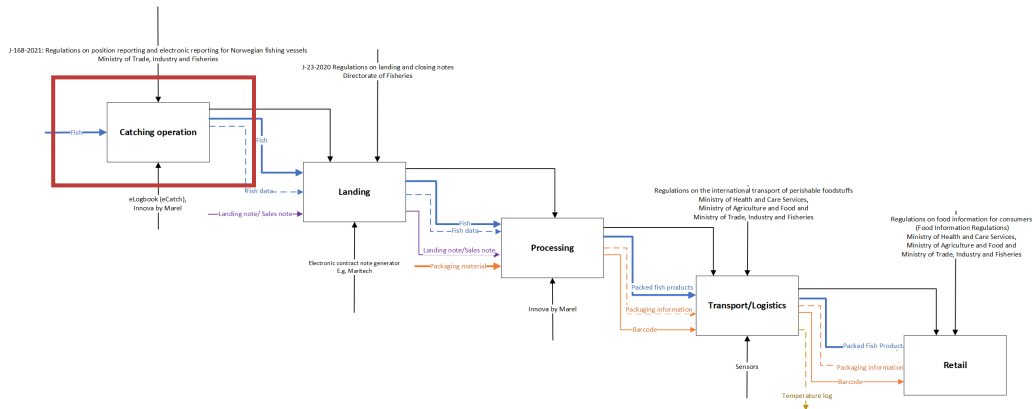
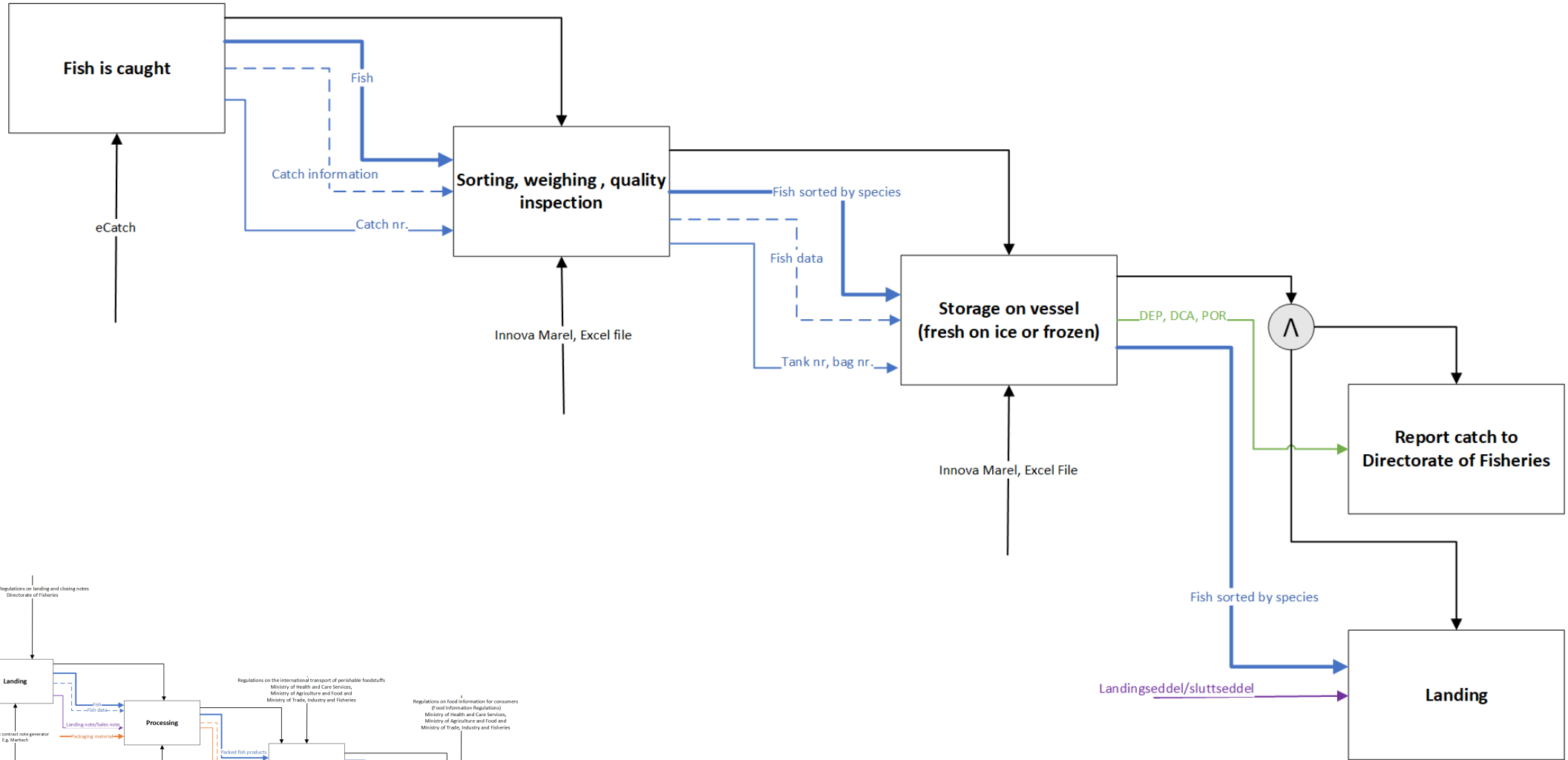
# Fisheries supply chain





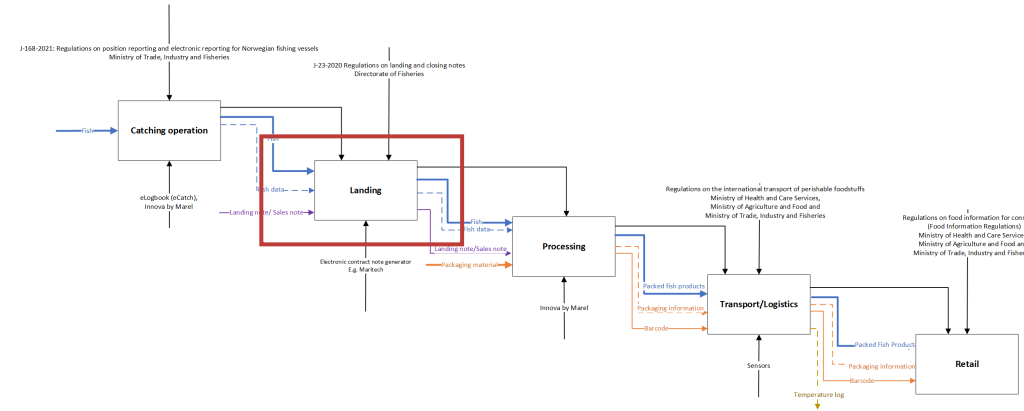
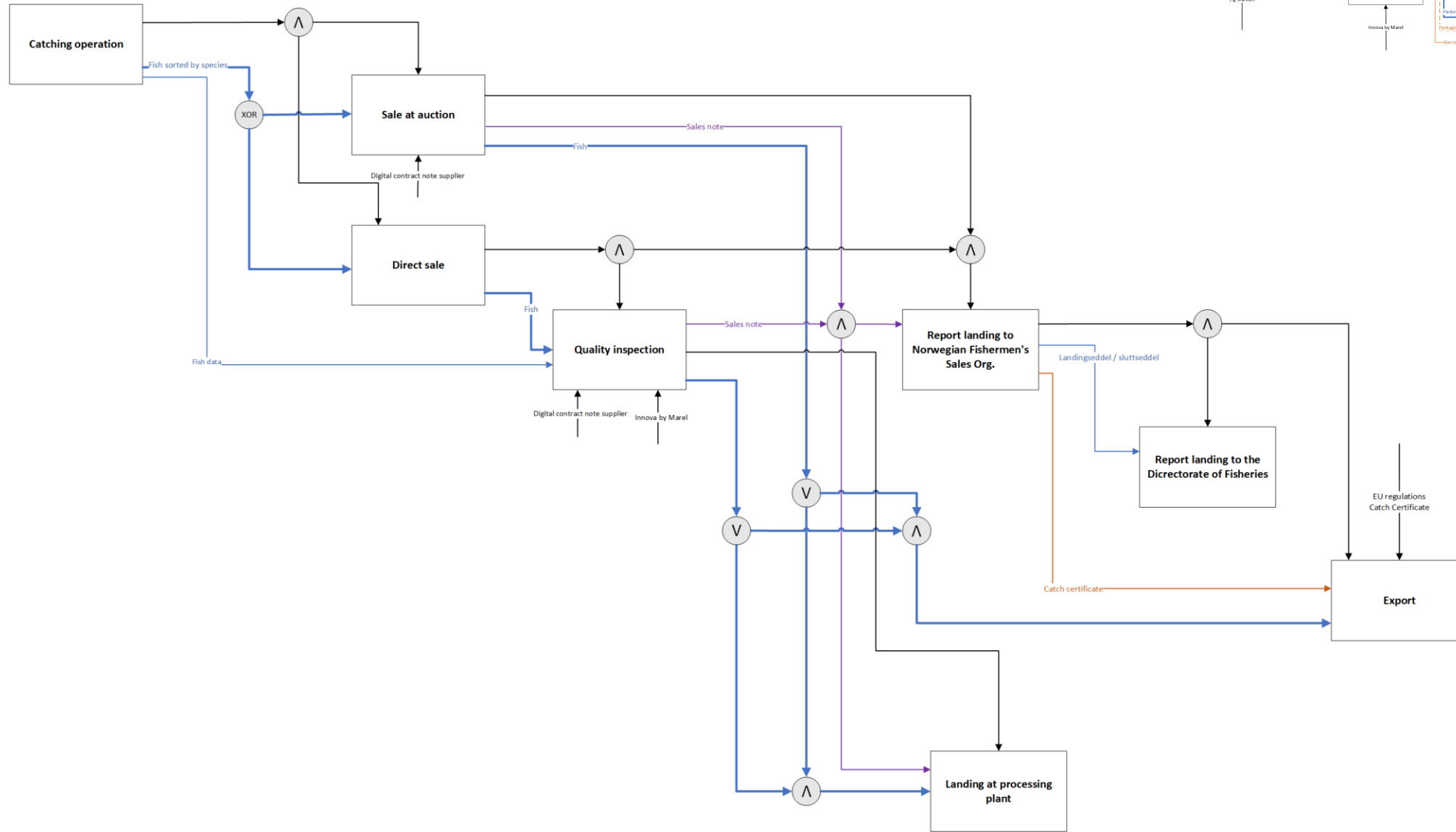


# Catching operation including on-board handling



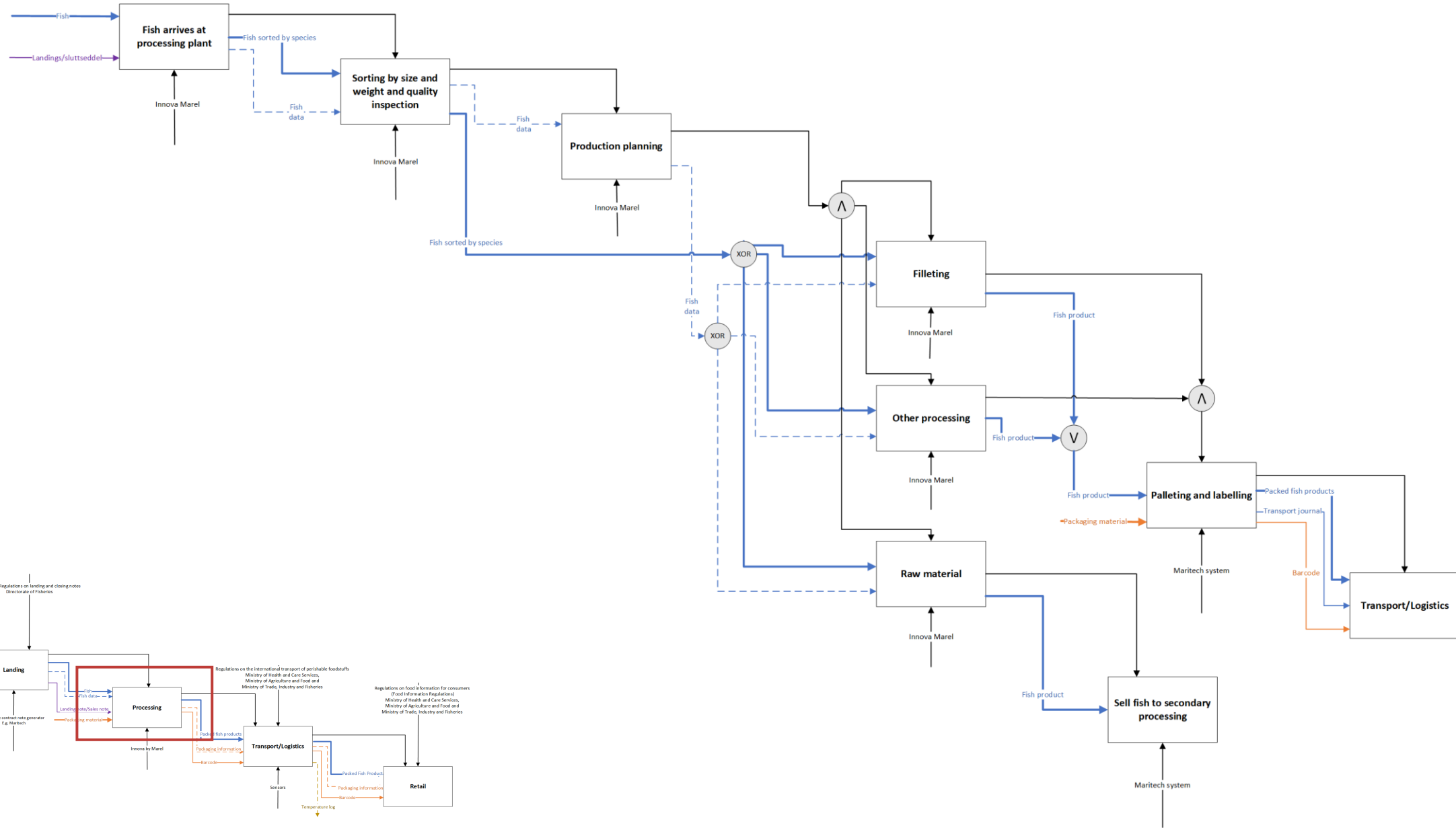


# Landing





# Processing





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# Key findings

- Efficient systems where there are regulations
  - Use of electronic systems for data capture
- No standardization on traceable units and the transformation of them
- Sharing the information captured at each step
  - Between processors and vessels
  - Consumers want increased knowledge about where products come from AND the history from catch to retail
    - Transport route and mode
- Data gaps on sustainability information
  - Measured energy and fuel consumption – from all steps in the supply chain!
  - Rest raw materials, bycatch



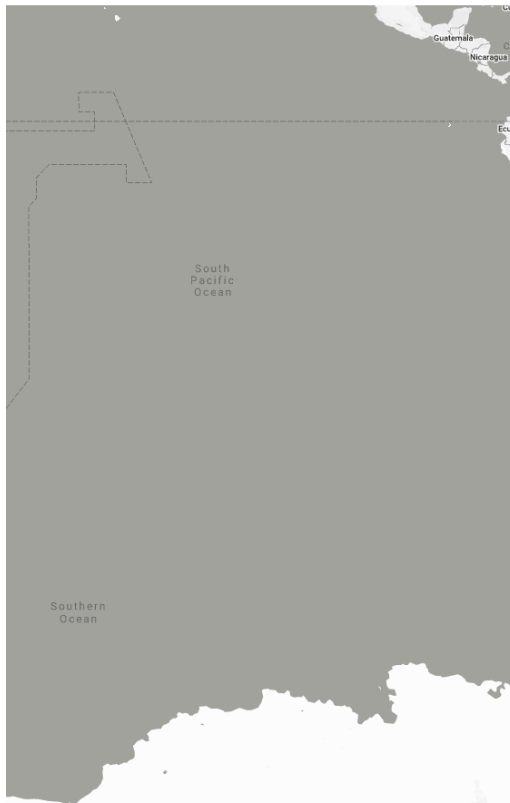
# Example of tracking tools



WHERE DOES YOUR SUPERBA KRILL OIL COME FROM?

We mean it  
Enter the lot or batch number below

NM150AS2988



DIN KONGEKRABBE - 1004070



STØRRELSE VEKT

XXXLARGE	4+
XXLARGE	3.5 - 4
XLARGE	3 - 3.5
LARGE	2.5 - 3
<b>MEDIUM</b>	<b>2 - 2.5</b>
SMALL	1.6 - 2

Fangstdato 18.08.2015

Sporingsnummer 1004070

These tracking tools allows the customer to trace the origin of the product

MANY attributes are still unknown:

- Processing history
- Transport route and mode
- Sustainability information
  - Bycatch
  - Etc...

ANTARCTICA



Edgar er en driftig fisker og pioner innen kongekrabbe fiske. Han er på havet i all slags vær året rundt og fisker både fisk og Kongekrabbe. Edgar arrangerer også fiske- og krabbesafari hvor totalopplevelsen med fangst, tilberedning, spising, en flytende sauna og ikke minst det å nyte naturen er viktige elementer.

Navn **Edgar Olsen**

Fisket krabber siden **2001**

Båt **MISS CROSBY**

Mannskap **1**

Største krabbe **9.2 kg**

Interesser **Han er en ivrig jeger, bjørn og elg. Danser og synger til musikk av Sputnik.**

Driver med fisketurisme **[Besøk side](#)**

# New technologies in Food Traceability Systems

- Blockchain technology
  - SMARTCHAIN project
  - Example: Helsingborg municipality
- AI and machine learning
  - Sustainability information linked to each fish
- IoT sensors
  - Real time data → go beyond averages





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# Barriers for data capture and information exchange

- Missing standardization
  - What information is required and for whom?
- Technology
  - Sensors are expensive
- Competition
  - Some companies have vertically integrated supply chains
- Sensitive information
- Data ownership

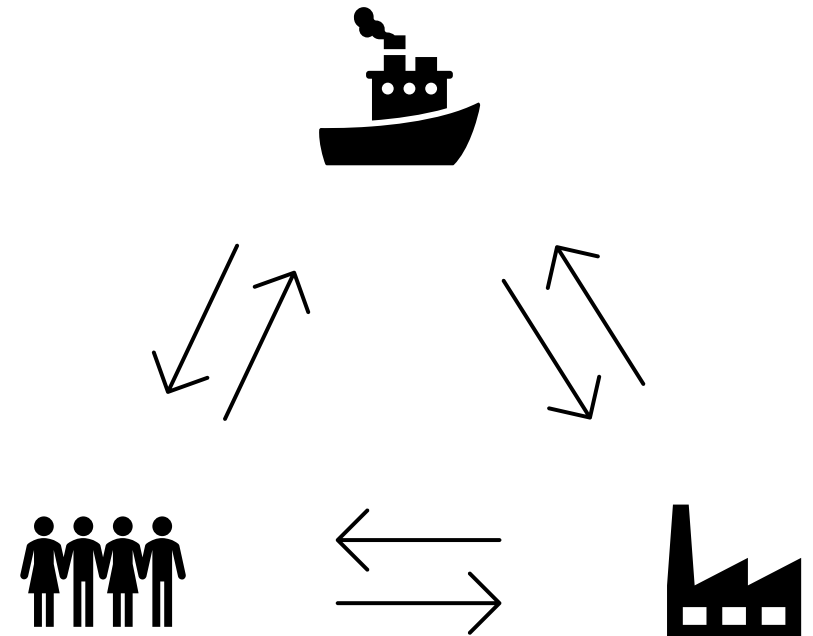




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# Summary and recommendations

- Many companies have electronic systems and a high degree of data capture
- Increasing external data sharing
- Standardisation of traceability systems
- Record and communicate sustainability information
  - Environmental
    - Energy and fuel consumption
    - Emissions
    - Sustainable fisheries (IUU)
  - Social
    - Food safety
    - Working conditions
  - Economic
    - Increase market share/ profits
    - Selling a high quality product from verified area







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Teknologi for et bedre samfunn