



**FIS040**  
**Piloting Digitalisation in  
Seafood Supply Chains**

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# Piloting Digitalisation in Seafood Supply Chains



June 2023

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SCOTLAND**

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**Published by: Fisheries Innovation & Sustainability (FIS)**

This report is available at: <http://www.fisorg.uk>.

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### **Suggested Citation:**

Fleming, F (2023). Piloting Digitalisation in Scottish Seafood Chains. A study commissioned by Fisheries Innovation & Sustainability (FIS) <http://www.fisorg.uk>.

### **Title:**

**Piloting Digitalisation in Scottish Seafood Chains**

### **First published:**

June 2023



## Executive Summary

### Overview of the FIS project

Seafood supply chains can be complex, and the capture and sharing of vital information from boat to plate is challenging and time consuming for everyone involved. Yet improving transparency in seafood supply chains can have significant benefits to fishing seafood businesses - for example, allowing them to improve product quality, position the industry proactively, and strengthen and protect seafood brands. This can also help businesses access lucrative markets, as data sharing is important to provide reassurance to retailers - and in turn to their customers - that seafood products have ethical and sustainable provenance.

There are many challenges in the efficient collection, verification, integration, and communication of data. Not least are: the huge volume of different types of data coming from different sources, or requested by different partners, all in different formats; barriers to integration of regulatory and other data streams; and barriers to smaller operators adopting new technology. FIS wanted to understand how to improve the provision of business and research intelligence to fishers, scientists, and managers. FIS asked whether a reliable and accessible digital 'one stop shop' for supply chain data could provide benefits, and reduce the burden of information exchange, along seafood supply chains.

Together with Verifact and Seafood Scotland, FIS embarked on a pilot project to prove the concept of digital data sharing between seafood businesses along supply chains, from catcher to retailer. The aim is to understand if it is possible to incrementally replace the current ad hoc methods of data collection with a co-ordinated digitalised approach.

'Digitalisation' in seafood is information captured once on a digital platform, shared under a set of permissions with selected stakeholders, to improve the efficiency, value and sustainability of seafood supply chains.

#### **FIS' Vision for Digitalisation**

Maximising the use of digital technologies will improve data collection and product traceability, and strengthen the seafood brands, with benefits along the supply chain:

- The catching sector is proactively involved in the verifiable collection of the necessary data to answer scientific, sustainability and other management questions, including carbon footprint.
- Value is added to catches through improved access to premium markets and differentiation of sustainable products.
- Producers, processors, food service and retailers have confidence in de-risked, cost-efficient, transparent supply chains.



FIS and Seafood Scotland commissioned seafood traceability experts Verifact to test how current ad hoc data collection could be improved by a coordinated approach, allowing data to be captured once but used as many times as needed and by different users - in science, markets, certification and management.

The pilots aimed to harness existing technology to enable automatic data transfer through the supply chain, and review how this technology could enhance the competitive position of Scottish nephrops (langoustine) and haddock through improved traceability and provenance. These species were selected due to their significant value to both UK and export markets, and to investigate the needs of both larger, more integrated businesses and smaller, more fragmented supply chains.

The aim of the pilots was to provide practical examples of digitalisation solutions to demonstrate how technology can add value to seafood supply chains, explore any lessons learned from this process, and identify recommendations for others looking to digitalise supply chains or conduct pilots in this area.

Key findings and recommendations from the project:

<b>Finding</b>	<b>Recommendation</b>
<p>In some cases, fishing vessel agents and primary processors are not passing on basic data such as vessel names or vessel information to secondary processors one step up the chain. Often, the former does not understand the demand for this type of data from retailers who want more knowledge of their supply chain, are seeking to de-risk it and have declared targets around sustainability that they are bound publicly to report on.</p>	<p>Clear communications, where the need and type of data required at retail level is understood further up the chain, would help get more accurate information while not placing secondary processors in a sometimes-difficult position of looking for this from vessels and agents who may not understand why it is needed. Forums attended by a range of supply chain participants should include agenda items on data trends, what data is needed from what supply chain partners in the short and longer terms.</p>
<p>Accurate certification, sustainability and labour policies at vessel level are not easily accessible further along the supply chain.</p>	<p>The Vessel Details Database developed as part of this project should be utilised to record and store vessel details in relation to vessel participation in sustainability projects and to record individual vessels' policy in relation to labour onboard.</p> <p>The Vessel Details Database should be further developed, and additional functionality could include:</p> <ol style="list-style-type: none"> <li>a. The facility to enable vessels to log in and store crew information on a per trip basis.</li> </ol>

	<p>b. The facility to upload and store crew related documents.</p> <p>c. The potential to register and authorise the use of data captured by other systems could be explored.</p>
<p>There are large amounts of data already captured, (through regulatory reporting systems and safety documentation systems, for example) which can be accessed by vessel owners and agents and could address many of the data deficits further along the supply chain.</p>	<p>The use and sharing of the data already captured by existing systems should be explored. The approach taken in relation to the data sharing agreements developed specifically for this project could be utilised as a template for this.</p>
<p>It is difficult to acquire data from companies unless there is a tangible and specific benefit to them.</p>	<p>Where projects are being implemented which have a sectoral benefit, consideration also needs to be given to participating companies and how they benefit individually from such initiatives to encourage buy-in.</p>
<p>Processing companies have the majority of data required under the GDST standard relevant to their own businesses but often require resources to collate the data as it is not held in a coordinated way that allows it to be shared with other supply chain participants.</p>	<p>When processing companies are reviewing, changing or upgrading their existing internal systems they should consider how these could be improved and integrated to facilitate external standards including GDST.</p>
<p>The awareness in the UK fishing industry of the GDST standard is low, and while it will be important in the future it is currently not a strong market driver.</p>	<p>GDST is actively engaged in communicating its role and benefits across the UK sector and organisations should liaise with the GDST team to keep abreast of the standard's development.</p>
<p>The infrastructure developed as part of this project provides a platform to deliver future digitalisation projects, making these projects more achievable and cost effective.</p>	<p>This infrastructure should be maintained.</p>
<p>This project and other similar ones (often requiring large capital expenditure) have experienced challenges around data sharing when the projects were quite advanced, with significant costs already incurred.</p>	<p>We recommend that in advance of undertaking these types of projects, companies should embark on smaller projects as a precursor to set out what data should be shared, why it should be shared and who will share it.</p>

### **What is the Global Dialogue on Seafood Traceability (GDST)?**

The GDST is an international, business-to-business platform established in 2017 to create the first-ever global industry standards for seafood traceability.

The GDST standards are global, voluntary, industry-led standards for seafood traceability that are designed to support three main goals:

1. To enable interoperability among all seafood traceability systems so businesses using different proprietary systems can participate seamlessly in digital traceability across entire supply chains;
2. To communicate (especially to producers/suppliers) harmonized expectations about the basic information (“key data elements”) that should accompany all seafood products, including to ensure seafood is produced legally and to support sustainability claims; and
3. To improve the verifiability of information in traceability systems by establishing agreed authoritative data sources

### **How was the project conducted?**

In order to carry out the work piloting a digital seafood data platform it was necessary to create a ‘test environment’. To facilitate this, two virtual machines<sup>1</sup> have been created and configured for the project using Microsoft Azure cloud-based services (a global leader in cloud-based services). One machine hosts the main database and portals that have been developed and implemented during the project and is situated on Microsoft servers at West London. The second machine, which is based at Cardiff in Wales, is for disaster recovery and the data from the first machine is backed up to this at regular intervals. The machines equate to having computers on which tools can be built to support data sharing projects, including this digitalisation project or other projects in the future. The cloud-based nature of the project allows it to be scaled up or shut down easily and securely.

Verifact have built a database that contains all the fields required to meet the Global Dialogue on Seafood Traceability standard (GDST). Verifact used the GDST ‘Key Data Element’ fields as a foundation upon which to develop the system. These fields have been agreed as being fundamental to best practice in exchange of data in seafood supply chains by a large group of key stakeholders. The data captured could be used for other purposes such as providing proof of provenance or feeding into carbon footprint calculations etc.

At the early stages of the project Verifact expected to get files in a range of formats containing data that is exchanged between buyers and sellers of seafood. This proved difficult for three key reasons:

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<sup>1</sup> a computer resource that uses software instead of a physical computer to run programs and deploy apps

1. Companies are slow to part with data unless there is a direct advantage for the company itself. This changed the direction of the project and Verifact did come up with ideas around specific company benefits to working with us.
2. The public adoption of GDST has been slower than FIS expected when embarking on the project.
3. The current economic climate meant many companies are battling with increasing costs and challenges with labour and tended to prioritise these issues ahead of becoming involved in projects looking into the future.

Data was obtained from four seafood processing companies, providing the project with sufficient data to draw meaningful conclusions about current data gaps and how they can be addressed.

As part of this project, Verifact also developed a 'Vessel Details Database' to capture vessel details regarding sustainability and labour practices on board. This provides a foundation, which could be expanded, to capture specific details in relation to, for example, crew on board on a per trip basis and documentation regarding those crew. This database provides an immediate value by introducing digitalisation around data currently required by supply chains while preparing for full supply chain digitisation in the longer term.

One of the benefits of engaging with the project offered to companies was to develop a bespoke page, telling the story of a product or company, accessed through a QR code that could be used on products or promotional materials. Two companies took this option (see Appendix One for an example).

## **Analysing the Data**

Verifact examined the data received from participating entities and identified a number of distinct categories:

- Data that was received from all of the companies.
- Data that could be supplied to processing companies by suppliers but is not transferred as current practice.
- Data that was not easily at hand in the companies but is in fact available from public sources, for example the vessel register etc.
- Data that is relatively static - vessel details, registration numbers, home ports etc. This data only changes when a vessel is sold or replaced.
- Product related data – this data is normally captured as product moves along a supply chain e.g. species, product format (fresh, live etc) date landed, catch area.

## **Technical Development**

The technical development element of the project involved four stages:



1. Enter into a hosting agreement in relation to the virtual machines.
2. Configure and implement the two virtual machines so as to meet the agreed requirements of the FIS Digitalisation Pilot Project.
3. Develop, test, and implement the Processor Portal.
4. Develop, test, and implement the Vessels Details Database.

## **User Agreements and Data Management**

Verifact have also developed user agreements for obtaining the data throughout the project and also for using the Vessel Details Database and the Processor Portal.

## **Benefits of the Vessel Details Database**

- The Vessel Details Database provides immediate value to Suppliers to Retail by providing a tool to capture information that retailers are currently looking for e.g. potential to be publicly available on a Fishery Improvement Project Member list,<sup>2</sup> allowing retailers to see, and select product from, fisheries that are actively engaged in processes to improve their sustainability credentials, if this is a priority for them.
- The database captures all 'static' vessel fields required by GDST.
- A vessel can enter data that meets requirements of FIP membership, GDST, or both.
- If data in the Vessel Details Database is combined with data in the Processor Portal, then all the main fields of GDST can be met. This is a manual process but provides the companies with a mechanism to meet the GDST standard manually.
- Implementing the Vessel Details Database provides immediate value to the supply chain, by collecting and sharing information that can be of direct, practical benefit to their sourcing practice or customer requirements, while supporting the longer-term goal of full GDST implementation.

## **Deliverables**

- The two virtual machines based in the UK have been configured, one in the UK, South London (main machine) and the other (disaster recovery) located at Cardiff in Wales.
- The infrastructure upon which to scale this project or develop new projects in the future is in place.
- A Toolkit was developed as part of this project elements of which can be used together or in isolation. This includes:
  - A vessel details database focused on sustainability and labour policies.
  - A suite of data sharing agreements which sets out the basis of how the data collected is processed and utilised.
  - An online portal which allows processors to upload data in line with GDST requirements to a cloud-based database.
  - A pre- project data questionnaire (see Appendix Six below)
- The code to develop the portals is implemented, tested and operational.
- This report includes the data gap analysis and recommendations to continue to implement digitalisation projects in UK fisheries.

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<sup>2</sup> <https://fisheryprogress.org/directory>



Fisheries Innovation & Sustainability is a coalition of experts driving strategic innovation for a prosperous and sustainable UK seafood industry. Our remit is to facilitate, coordinate and leverage investment for innovation in UK seafood.

Our Member Organisations include:



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