

VeriFish

The sustainability indicator framework to communicate responsible aquafood production and consumption patterns

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Disclaimer

VeriFish offers a framework of verifiable sustainability indicators for communications about sustainability based on FAIR data from EU- and global aquafoods repositories, brought together through the extraordinary collaboration of European-wide actors. Leveraging on this indicator, VeriFish designs, develops, and disseminates a number of media products to help citizens, seafood consumers and retailers, associations and policy makers make informed consumption choices.

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Glossary of terms

Item	Description
API	Application Programming Interface
ASC	Aquaculture Stewardship Council
CC	Creative Commons
CF	Cloud Functions
EC	European Commission
EMFAF	European Maritime, Fisheries and Aquaculture Fund
FAIR	Findable, Accessible, Interoperable, Reusable
GRSF	Global Record of Stocks and Fisheries
HoReCa	Hotels, Restaurants, Catering
IUCN	International Union for Conservation of Nature
KB	Knowledge Base
MSC	Marine Stewardship Council
QR code	Quick Response Code
SDO	Standard Development Organisation
UI	User Interface
UX	User Experience

EXECUTIVE SUMMARY

This deliverable outlines the functional and technical specifications of the VeriFish Mobile App, designed to support transparent communication about sustainable seafood choices. It builds upon the sustainability indicator framework developed in WP2 and responds directly to the project's mission of enabling citizens, producers, retailers, and stakeholders across the seafood value chain to make informed consumption decisions. The VeriFish Mobile App translates complex datasets into an accessible digital product, integrating data on nutrition, sustainability, biodiversity, and provenance.

The design of the application is user-centric, informed by mock-ups and requirements gathered through a series of stakeholder workshops. The Mobile App will serve as an intuitive front-end to the underlying VeriFish Knowledge Base (KB), presenting FAIR data from sources such as GRSF, FishBase, and EuroFIR within a unified interface. Users will primarily access the system through existing GRSF QR codes, which serve as unique identifiers (UUIDs), enabling seamless linkage between stock-level information and value-added content such as food composition, recipes, and sustainability scores. Ultimately, the Mobile App will be one of the core media products of VeriFish, serving as a flagship tool for engaging a broad range of user groups—from informed consumers to seafood retailers—with verifiable, actionable knowledge.

This document details the system architecture, key components, APIs, data flows, and user interaction models.

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1. Introduction & Background

The VeriFish Mobile Application is a key component of the project's ambition to make sustainability information about seafood products accessible, verifiable, and actionable for European consumers. As part of the mission to simplify and standardise communication about aquafood sustainability, the mobile App will serve as a user-centric gateway to the VeriFish framework of indicators, drawing from reliable data sources. This document outlines the technical and functional requirements of the mobile application, detailing how it will integrate nutrition, environmental, and societal indicators into an intuitive digital interface. The Mobile App will enable users including consumers, retailers, and other food chain actors, to access transparent and traceable information, empowering informed purchasing decisions and encouraging responsible consumption patterns.

1.1. Objectives of the deliverable

This deliverable outlines the requirements and specifications for the development of the VeriFish Mobile App, one of the core media products envisioned by the project. Building upon the sustainability indicator framework defined in *D2.1 Indicator framework defined* and the data structure elaborated in subsequent deliverables (*D2.2 Indicator framework developed*, *D2.4 VeriFish Knowledge Base - interim version*), this document translates conceptual idea into concrete technical and user-centric specifications. The primary objective is to ensure that the Mobile Application can serve as an intuitive, reliable, and accessible interface for visualizing seafood-related sustainability data across diverse user groups.

Specifically, the deliverable aims to:

- Define the scope and role of the web app within the broader VeriFish ecosystem and its alignment with project goals;
- Define the primary user personas and capture their needs through representative use cases;
- Document the functional requirements for the application, covering core features such as species search, indicator display and printable Factsheet ;
- Describe the technical architecture, including frontend/backend components, data sources, storage mechanisms, and third-party integrations
- Detail the design principles guiding the user interface and overall user experience;

This specification document serves as a foundation for the subsequent design and development phases and will guide the implementation of the Mobile APP described in Deliverables *D3.4 Prototype of the web app - initial release* and *D3.5 Prototype of the web app - final release*.

1.2. Links with other deliverables

This deliverable is closely interlinked with several other key outputs of the VeriFish project. It builds directly on the *indicator framework defined in D2.1* and the data infrastructure outlined in *D2.4 Prototype of the web app - final release* and *D2.5 VeriFish Knowledge Base - final version*, ensuring that the Mobile APP reflects the validated sustainability, nutrition, and provenance indicators. Additionally, it complements the communication and stakeholder engagement strategies presented in *D3.1 Communication, stakeholder engagement plan*, and sets the foundation for the implementation of the Mobile App, as described in *D3.4 Prototype of the web app - initial release* and *D3.5 Prototype of the web app - final release*.

1.3. Structure of the deliverable

The deliverable is structured as follows:

- **Section 1** introduces the VeriFish web application and outlines its purpose, scope, and strategic role within the overall VeriFish ecosystem.
- **Section 2** captures user requirements, including key personas, representative use cases, and functional needs that inform the design and development of the app.
- **Section 3** details the technical specifications of the web app, including the system architecture, technology stack, data sources, API integrations, and compliance measures.
- **Section 4** focuses on the user interface (UI) and user experience (UX) aspects, presenting the design principles, accessibility guidelines, wireframes, and user journey mapping.

Each section progressively builds toward a comprehensive specification that will guide the implementation of the VeriFish web app prototype in subsequent phases.

2. User Requirements

This chapter outlines the user requirements that guide the design and functionality of the VeriFish Mobile App. As a key component of the project's strategy to make sustainability and nutritional information on seafood accessible and actionable, the Mobile APP must respond effectively to the needs of a diverse set of stakeholders. These include consumers, seafood producers, retailers, HoReCa operators, and policymakers, each with unique expectations and use scenarios.

To ensure the Mobile App is user-centric, this section begins by identifying core user personas, describing their goals and motivations in the context of seafood consumption and sustainability. It then translates these into concrete use cases and user stories that reflect real-world interactions with the platform.

2.1. User Personas

To ensure the VeriFish Mobile App delivers relevant information to its target audiences, it is important to understand the characteristics, and information needs of its intended users. This section defines key user personas and behaviors of real users involved in seafood consumption, production and distribution.

The identified user personas are:

- **Seafood Producers:** Fishermen and professionals engaged in fisheries or aquaculture production who are interested in showcasing the sustainability of their practices and contributing verified data to increase transparency in the value chain.
- **Consumers:** Individuals or families looking to make responsible purchasing decisions based on sustainability, nutrition, and seasonality. They value simple, trustworthy information that helps them choose seafood aligned with environmental and health-conscious values.
- **Seafood Retailers & HoReCa (Hotels, Restaurants, Catering):** Businesses that sell or serve seafood and seek tools to communicate sustainability credentials to customers, improve supply chain traceability, and align with regulatory or voluntary sustainability standards.
- **Policymakers & Regulatory Authorities:** Institutional stakeholders responsible for designing, enforcing, or monitoring sustainability policies. They require access to harmonised data and indicators to support policy evaluation, reporting, and stakeholder engagement.

2.1.1. Seafood Producers

Fisherman and Seafood producers represent one of the primary user groups addressed by the VeriFish project. In particular, VeriFish targets small-scale, local operators who are keen to assess and demonstrate the sustainability of their practices. Whether working at sea or managing fish farms, these producers seek reliable, science-based tools to evaluate their environmental, social, and economic impact. Many are aware of increasing consumer and market demand for transparency, and wish to verify whether their methods truly align with sustainability goals.

The VeriFish Mobile & web app based on verifiable indicators will allow them to:

- Carry out self-assessments of fishing or aquaculture practices,
- Benchmark their activities against neutral, harmonised sustainability metrics,
- Communicate their efforts and results credibly to retailers, consumers, and policymakers.

2.1.2. Consumers

Consumers are central to the VeriFish vision. Consumers want to make informed, responsible choices but they often face unclear labels, unfamiliar species names, or few data on sustainability.

The VeriFish Mobile & web app empowers them through a user-friendly and clear, verified catalogue of seafood species, with Factsheet available in common local languages (at least the consortium languages).

This allows citizens to easily identify the species they're about to purchase and check reliable information on three fundamental pillars:

- **Environmental Sustainability:** this pillar evaluates the impact of fishing and aquaculture practices on marine ecosystems. It considers aspects such as stock status, fishing gear selectivity, habitat effects, bycatch, and resource use. The goal is to highlight seafood sourced from operations that preserve biodiversity, minimize environmental degradation, and promote long-term ecosystem health.
- **Nutrition – Nutritional Value** Seafood is a key part of a healthy diet, but not all products offer the same benefits. This pillar provides consumers with reliable information about the nutritional profile of species such as omega-3 content, vitamins, minerals, and protein quality helping people make choices that align with their dietary needs and well-being.
- **Socio-Economic:** this pillar focuses on the social and economic dimensions of fisheries and aquaculture such as working conditions, fair trade, local employment, and community well-being. It supports a food system that is not only sustainable but also just and inclusive.

2.1.3. Retailers & HoReCa (Hotels, Restaurants, Catering)

Retailers and HoReCa actors including hotels, restaurants, and catering services play an important role in bridging the gap between seafood producers and consumers. As curators of the final step in the seafood value chain, they are key decision-makers in what products reach the public, how they are presented, and what sustainability stories are told.

The VeriFish Mobile App supports these users by providing verifiable indicators on sustainability, nutrition, and provenance about species. This allows chefs, purchasing managers, and retail buyers to confidently select and promote seafood products that meet growing consumer expectations around health, environmental responsibility, and ethical sourcing.

Through the Mobile APP, Retailers and HoReCa stakeholders can:

- Access simplified, trustworthy sustainability data for seafood products,
- Highlight responsible sourcing practices to their customers,
- Educate and inspire consumers with transparent, easy-to-understand information,
- Align with EU green goals and Farm to Fork strategy through sustainable procurement choices.

2.1.4. Policymakers & Regulatory Authorities

The VeriFish mobile App supports these users by offering a practical tool for accessing harmonised and verifiable data across the three pillars of sustainability: environmental, nutritional, and socio-economic. Through the app, authorities can:

- Verify seafood product claims in real-time at points of sale, markets, etc.,

-
- Access up to date, science-based indicators
 - Evaluate transparency across the seafood value chain.

For policymakers, the app acts as a decision-support interface, enhancing transparency and facilitating evidence-based regulatory actions.

2.2. User Stories & Use cases

This section presents the use cases that illustrate how different user personas will interact with the VeriFish Mobile App. These scenarios are based on needs identified during the requirements gathering phase and serve to guide the design of core functionalities. Each use case outlines the context, user actions, system responses, and intended outcomes, helping to validate both the technical and experiential aspects of the platform.

The following user story highlights how the VeriFish Mobile App empowers small-scale producers to communicate the sustainability of their practices effectively.

2.2.1. #1 Consumer Use Case: Informed Seafood Purchasing Decisions

One of the core functionalities of the VeriFish web & Mobile App is to empower consumers with the tools and knowledge to make informed, responsible seafood choices. This use case focuses on everyday seafood shoppers whether in supermarkets, fish markets, or at home who seek clear, trustworthy information about the sustainability and nutritional value of the products they consume. Upon scanning a QR code related to a product, or by manually searching for a fish species within the Mobile App, users are presented with detailed, verifiable data from the VeriFish Knowledge Base. This includes indicators such as stock health, fishing or farming methods, environmental impact, and nutritional composition.

To support decision-making, the Mobile APP displays a sustainability score via an infographics (i.e. traffic light system) based on the VeriFish indicator framework. Through this functionality, the VeriFish Mobile App enables consumers to align their dietary choices with their environmental values, fostering a culture of transparency and accountability in the seafood supply chain.

Below is a recap of how this use case is handled:

Actors: General consumers, seafood shoppers, environmentally conscious individuals, families, and food enthusiasts.

Scenario: A consumer at a supermarket, fish market, or restaurant wants to make a sustainable seafood choice but lacks access to clear and reliable sustainability information.

Workflow:

Scanning a Product:

- The user scans a QR code associated with the seafood product, for example on the menu (if present)
- Alternatively, the user can search for a fish species manually within the app.

Accessing Sustainability and Nutritional Information:

- The app displays verifiable indicators from the VeriFish Knowledgebase and other data sources, providing details on:
 - **Stock health** (e.g., overfished, sustainable levels).
 - **Fishing or farming methods** (e.g., wild-caught, aquaculture).
 - **Environmental impact** (e.g., carbon footprint, bycatch risks).
 - **Nutritional value.**

Making an Informed Decision:

- The app provides a sustainability risk score based on the VeriFish indicator framework in an infographics visualization. The definition of this aspect is still on.
- Users receive alternative recommendations if a product has a high sustainability risk (e.g., suggesting a more sustainable fish alternative).

Educational & Engagement Features:

- Users can access recipes, and interactive flashcard games for kids to promote seafood literacy.
- The Mobile App may offer notifications about local sustainable seafood events or campaigns.

Outcome:

Consumers make informed, responsible seafood purchasing choices based on transparent, data-driven insights, contributing to sustainability efforts.

2.2.2. #2 Fisherman Use Case: Fishermen verifying and sharing sustainable catch data

In this scenario, a fisherman uses the Mobile App to log specific details of a recent catch species, fishing method, location (e.g., FAO zones), and applicable certifications (such as MSC certification). This information is automatically linked to the VeriFish Knowledge Base and sustainability indicator framework to assess the catch's environmental and regulatory standing. The system then generates a unique QR code representing a digital catch factsheet, which can be shared in various ways.

The result is a transparent, verifiable product profile accessible to wholesalers, retailers, and consumers. This enhances trust, strengthens market access for fishermen, and encourages alignment with sustainability expectations.

Below is a recap of how this use case is handled:

Actors: Independent fishermen, fishing cooperatives, small-scale fishing operators.

Scenario: A fisherman wants to verify the sustainability of their catch and provide transparency to buyers, retailers, and consumers.

Workflow:

Logging Catch Data:

- The fisherman want “tell his story” and registers their catch details in the VeriFish Mobile App, including:
 - **Species caught** (linked to VeriFish Knowledge base).
 - **Fishing method** (e.g., line-caught, trawling, purse seine).
 - **Catch location** (linked to sustainable fishing zones using FAO Area).
 - **Compliance certifications** (e.g., MSC, EU fisheries regulations).
 - Other information
 - Provide all the required indicators attributes
 - Add recipes ?

Generating a Digital Catch Factsheet (QR Code):

- The system processes the data (*VeriFishication*) and verifies the sustainability status of the catch through the data submitted and VeriFish Indicator Framework
- A QR code linked to the Factsheet is generated, containing all relevant details of the catch.
- Fishermen can print this QR code on invoices, or digital records shared with buyers.

Enhancing Market Access & Transparency:

- The QR code allows wholesalers, retailers, and consumers to verify catch details in the VeriFish app.
- Fishermen can access real-time feedback from the market, helping them align their practices with sustainable demand.

Outcome:

- Fishermen gain credibility and transparency, improving their ability to sell to eco-conscious retailers and consumers.
- Provided they have traceability mechanisms in place (such as the Chain of Custody requirements of a certification scheme) they can demonstrate compliance with sustainability standards and access to markets that favor sustainable seafood.

In this phase of the project, the *verification* step referred to as “VeriFishication” will be implemented in a simplified, light-touch manner and conducted directly by the VeriFish project team. The team will manually review the data submitted by users (e.g., catch details, certifications, locations) to ensure it aligns with the VeriFish Indicator Framework and reference datasets. This approach allows for flexibility during the prototyping phase, enabling the team to test workflows and refine the data model. While not intended as a formal certification process, this internal validation step ensures a baseline level of data quality and coherence, laying the groundwork for more scalable and automated verification mechanisms in future development stages.

2.2.3. #2B Aquaculture Producer Use Case: Managing and Certifying Sustainable Aquaculture Production

The aquaculture use case closely mirrors the workflow established for wild-capture fisheries in the producer use case, with adaptations specific to farmed seafood. Like fishermen, aquaculture producers can use the VeriFish Mobile APP to input key data about their products, such as species farmed, farming methods (e.g., recirculating systems, open net pens), location of the aquaculture facility, and relevant sustainability certifications.

The system processes this information in alignment with the VeriFish Indicator Framework to assess sustainability, ultimately generating a QR code linked to a detailed product factsheet. This enables aquaculture businesses to transparently communicate their practices to retailers, food service providers, and consumers. While the overall objective remains the same, the aquaculture use case emphasizes parameters specific to aquafarming environments, including feed sources, water quality, and ecosystem impact.

Actors: Fish farmers, aquaculture companies, sustainable seafood certification bodies.

Scenario: A fish farmer wants to showcase sustainable aquaculture practices, gain certifications, and make data-driven improvements to their farming operations.

Workflow:

Registering Farmed Seafood:

- The producer enters farming details into the VeriFish system, including:
 - Species farmed.
 - Farming location (linked to environmental data).
 - Feed sources & sustainability certification.
 - Water quality, carbon footprint, and biodiversity impact.

Supporting Sustainability Benchmarks:



- The system assesses farming practices against sustainability benchmarks (e.g., ASC, EU Aquaculture Standards).
- If the necessary certification can be verified based on the data available — for example, if the farm is listed as currently certified by ASC — a sustainability verification QR code can be issued for each batch of seafood. Otherwise, if the required information is not available or verifiable, the QR code cannot be provided.

Market Transparency & Retailer Integration:

- The QR code enables wholesalers, retailers, and consumers to access verified information about the product.
- The app connects producers with retailers and HoReCa businesses looking for verified sustainable seafood sources.

Monitoring & Continuous Improvement:

- The dashboard provides real-time sustainability performance metrics.
- Farmers receive recommendations on improving feed sustainability, reducing carbon footprint, and optimizing water quality.

Outcome:

Aquaculture producers can increase their competitiveness in the market by demonstrating compliance with sustainability and traceability standards.

The data-driven approach helps optimize production and improve environmental impact over time.

2.2.4. #3 Retailer & HoReCa Use Case: Enhancing Seafood Transparency in Businesses

Retailers and food service providers play a critical role in shaping consumer behavior and influencing demand for sustainably sourced seafood. This use case addresses the needs of supermarkets, fishmongers, restaurants, and catering businesses (HoReCa) that try to meet growing consumer expectations for transparency and environmental responsibility in their seafood offerings. With The VeriFish Mobile App, these actors can easily generate and display QR codes linked to verified sustainability information, helping them communicate the provenance and ecological impact of their products in real time.

The VeriFish Mobile App enables these businesses to highlight their commitment to sustainability through visible cues such as “Responsible Choice” badges.

Below is a recap of how this use case is handled:

Actors: Supermarkets, fishmongers, restaurants, catering businesses, seafood retailers.

Scenario: A retailer or restaurant wants to provide transparent sustainability information to customers, ensuring they comply with consumer demand for eco-friendly and responsible seafood sourcing.

Workflow:

Generating & Integrating QR Codes:

- Businesses use the VeriFish web platform to **print QR codes** for their seafood products based on verified sustainability data.
- The QR codes can be printed on **menus, or visible at shelf level**

Customer Engagement & Trust-Building:

- When customers scan a QR code in-store or at a restaurant, they instantly receive detailed sustainability information about the product.

Promotional & Awareness Campaigns:

- Retailers can participate in seasonal seafood promotions linked to sustainability campaigns.
- Restaurants can highlight **responsible seafood choices** on menus, supported by the app's educational features.

Outcome:

Retailers and restaurants enhance customer trust, boost brand reputation, while promoting responsible seafood consumption.

For fishermen, the VeriFish mobile App provides a simple and verifiable way to document and promote sustainable fishing practices, ensuring market access. The consumer use case focuses on making individual seafood choices easier and more sustainable, while the retailer/HoReCa use case ensures that businesses can transparently communicate sustainability credentials and align with independent ecolabels and European environmental policies.

3. Technical Specifications

The development of the VeriFish Mobile App followed the Agile methodology, which is based on an adaptive approach and incorporates testing and subsequent iterations throughout the whole development cycle. Such an approach enabled the gradual improvement of the mobile app thanks to the obtained feedback from the stakeholders.

Overall, the development process consisted of six stages, in which both VeriFish partners and external users will be involved

The six stages consisted of:

- Ideation and planning: defining the user needs, the objectives of the mobile app, the user flow and the potential set of features.
- Design: Presenting the low-fidelity wireframes, designing mock-ups, proceeding to the design of the components, validating the mock-ups with the VeriFish partners and finalising them.
- Development: Setting up the technical infrastructure for the Mobile App, integrating APIs & databases, ensuring code quality and security, fixing bugs.
- Testing: Testing the developed alpha and beta versions of the Mobile App with external stakeholders and analysing their feedback.
- Iteration / Development: Iterating the beta release based on the insights obtained from the two testing rounds and implementing the final development sprint prior to the launch.
- Launch Releasing the mobile app on the App Store, Google Market and web

3.1. Technology Stack – Frontend Framework, Firebase, APIs, frameworks used

To support a scalable, and cross-platform user experience, the VeriFish Mobile App is built using a modern, flexible technology stack that balances performance, development efficiency, and future maintainability. This section provides an overview of the core technologies selected for both frontend and backend development, as well as key integrations with external APIs.

The chosen architecture ensures a consistent user interface across devices from smartphones to desktop browsers while enabling real-time data access and integration with external data services.

Below is a breakdown of the main components of the technology stack:

Frontend: [Compose Multiplatform](#), built on top of [Kotlin Multiplatform](#), allowing us to develop a native app for Android and iOS with a single codebase while also supporting responsive layouts for large displays such as tablets and browser apps.

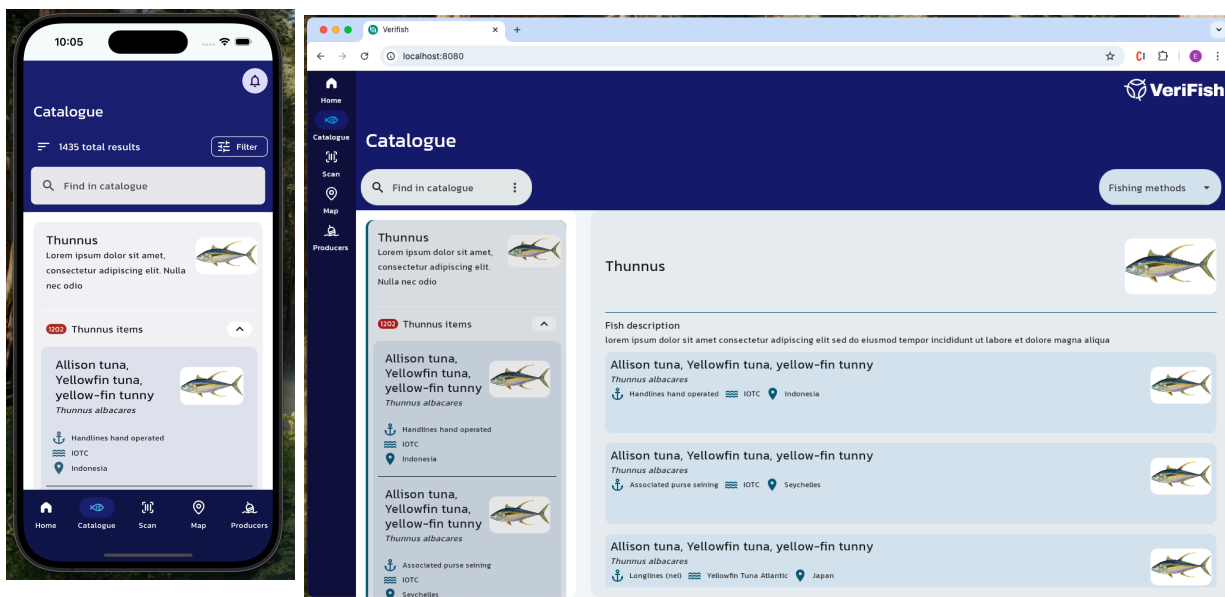


Figure 1 Mobile and Desktop Versions from the simulator

Backend: [Firebase](#) (Firestore / Cloud Functions)

Authentication: Firebase Authentication (Email/Password, Google Sign-In, etc.)

External APIs: [VeriFish Knowledge Base](#), [Wikimedia](#) and [OpenAI](#)

3.2. Architectural schema

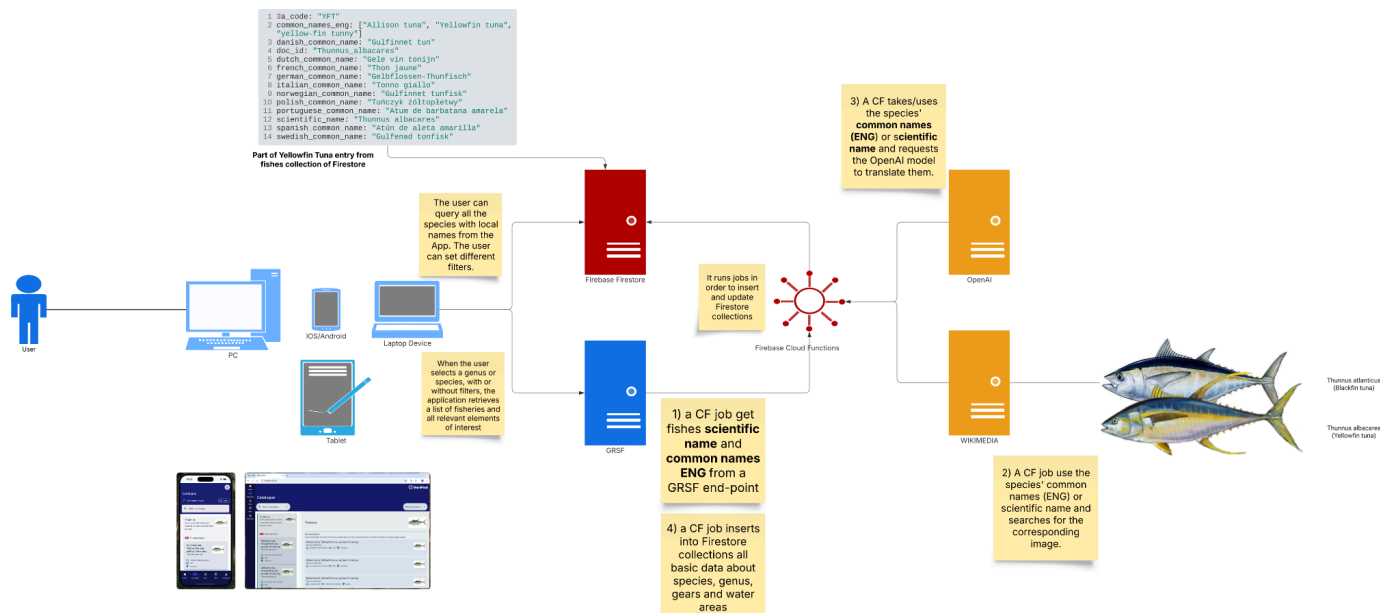


Figure 2 Data flow and the system architecture of the VeriFish Mobile Application

The diagram illustrates the data flow and the system architecture of the VeriFish Mobile Application, highlighting its integration with external services.

Client Interaction:

- Users can access the application through multiple platforms: PC, laptops, tablets, and mobile devices (iOS/Android).
- Through the interface, users can search for species using scientific or common names (with multilingual support) and apply filters to refine the results.
- Upon selecting a genus or species, the app queries relevant collections and returns comprehensive data, including names, images, and contextual information.

Data Retrieval and Storage:

- The system is built around Firebase Firestore as the central database for storing species-related data.
- Firebase Cloud Functions (CF) are used to automate background jobs responsible for fetching, processing, and updating data.

Cloud Functions Workflow:

- **Step 1:** A CF job retrieves scientific names and English common names of species from a VeriFish Knowledgebase endpoint.
- **Step 2:** Another CF job utilises either the scientific or English common names to query Wikimedia and fetch corresponding species images.
- **Step 3:** A separate CF job sends the common names (ENG) or scientific names to the OpenAI model to generate translated names in multiple languages.
- **Step 4:** Once all relevant data is collected (names, taxonomy, images, water areas, fishing gears), it is inserted into Firestore and VeriFish Knowledgebase collections.

Data Model:

- Each species entry (e.g., *Thunnus albacares*) includes a unique code (*3a_code*), scientific name, and localized common names in various European languages (e.g., Italian, German, Swedish).
- The database allows for multilingual querying and supports downstream UI display in the user's local language.

3.3. Data Storage & Management

The VeriFish Mobile App is designed with a hybrid data architecture that balances robust, authoritative data sources with real-time responsiveness and scalability. At the core of the system is the VeriFish Knowledge Base, which serves as the primary backend for the Mobile App. This knowledge base integrates multiple trusted datasets, including the Global Record of Stocks and Fisheries (GRSF), FishBase, and other domain-specific repositories. It is the authoritative source for sustainability indicators, species profiles, provenance information, and associated metadata that drive the app's functionality and content.

Data from the VeriFish Knowledge Base is exposed via a dedicated API layer. These APIs allow the frontend to retrieve species, sustainability indicators, nutritional values, provenance information, and compliance records in a structured format. This abstraction ensures decoupling between the user interface and backend, improving modularity and maintainability.

To ensure fast data access and smooth performance particularly under high user load the VeriFish app implements Firebase as a high-performance caching layer on top of the main knowledge base. While the VeriFish Knowledge Base powers the underlying data logic and ensures data integrity, Firebase is used to

cache frequently accessed records, enabling quicker retrieval, reducing latency, and minimising repeated calls to external APIs or semantic endpoints.

Firebase stores and manages data using a NoSQL structure, organised into Collections and Documents. Each document is a JSON-like object that can hold various data types (strings, arrays, timestamps, nested objects) and can also include sub-collections. This schema-less flexibility allows Firebase to efficiently manage the wide range of entities and relationships inherent to the VeriFish domain, such as seafood products, sustainability indicators, factsheets, and more.

To support complex queries across species, indicators, and metadata, the Mobile App integrates customized search and filtering endpoints. These allow users to browse or narrow down seafood options based on sustainability level, fishing method, certification status, and other attributes.

In addition to improving scalability and response time, Firebase also supports real-time synchronization and push notifications, which are important for user engagement and timely updates. This includes alerts about newly added seafood factsheets, or updates to sustainability scores.

Species Collection: data structure

```
3a_code: "YFT"
aphia_id: "127027"
common_names_eng: ["Allison tuna", "Yellowfin tuna", "yellow-fin tunny"]
danish_common_name: "Gulfinnet tun"
doc_id: "Thunnus_albacares"
dutch_common_name: "Geelvin tonijn"
fishbase_id: "143"
fishery_occurrences: 462
french_common_name: "Thon jaune"
gbif_id: "2374013"
genus: /genuses/Thunnus
german_common_name: "Gelbflossen-Thunfisch"
imageUrl:
"upload.wikimedia.org/wikipedia/commons/thumb/c/c3/Thunnus_albacares.png/720px-Thunnus
_albacares.png"
imageUrls: ["https://upload.wikimedia.org/wikipedia/commons/a/a3/Atlantic_cod.jpg"]
italian_common_name: "Tonno giallo"
iucn_code: ""
norwegian_common_name: "Gulfinnet tunfisk"
polish_common_name: "Tuńczyk żółtopłetwy"
portuguese_common_name: "Atum de barbatana amarela"
scientific_name: "Thunnus albacares"
spanish_common_name: "Atún de aleta amarilla"
stock_occurrences: 5
```

```
swedish_common_name: "Gulfenad tonfisk"  
total_occurrences: 467  
updateAt: "10 marzo 2025 alle ore 05:00:04 UTC+1"
```

Genuses Collection: data structure

```
fishery_occurrences: 1202  
fishesRefs: [  
  /fishes/Thunnus_obesus,  
  /fishes/Thunnus_tonggol,  
  /fishes/Thunnus_thynnus,  
  /fishes/Thunnus_maccoyii,  
  /fishes/Thunnus_orientalis,  
  /fishes/Thunnus_atlanticus,  
  /fishes/Thunnus_alalunga,  
  /fishes/Thunnus_albacares  
]  
genusName: "Thunnus"  
stock_occurrences: 32  
total_occurrences: 1234  
updateAt: "10 marzo 2025 alle ore 06:00:31 UTC+1"
```

Fishing Gears Collection: data structure

```
doc_id: "01.1_isscfg"  
fishing_gear_code: "01.1"  
fishing_gear_code_type: "isscfg"  
fishing_gear_name: "Purse seines"  
occurrences: 1329  
updateAt: "10 marzo 2025 alle ore 07:00:05 UTC+1"
```

Water Areas Collection: data structure

```
area_code: "01"  
area_code_type: "fao"  
area_name: "Africa"  
doc_id: "01_fao"
```

```
fishery_occurrences: 6
stock_occurrences: 1
total_occurrences: 7
updateAt: "10 marzo 2025 alle ore 09:00:24 UTC+1"
```

3.4. API Integration

To enrich the user experience and enhance the accessibility of sustainability information, the VeriFish Mobile APP integrates multiple external data sources and services via APIs. While the core of the system is driven by the VeriFish Knowledge Base, additional functionalities such as multilingual support, media enrichment, and others are enabled through carefully selected APIs.

3.5. VeriFish Knowledge Base endpoint

Fishes and Genuses

- [GET Species with Scientific Name and Occurrences](#): It retrieves species data as `csv`, including the following fields: `species_code`, `species_code_type`, `species_name`, `total_occurrences`, `stock_occurrences`, and `fishery_occurrences`.

Example:

species_code	species_code_type	species_name	total_occurrences	stock_occurrences	fishery_occurrences
YFT	asfis	<i>Thunnus albacares</i>	467	5	462
SKJ	asfis	<i>Katsuwonus pelamis</i>	378	6	372

- [GET Species common names in English with his Genus](#): It retrieves species data as `csv`, including the following fields: `species_scientific_name`, `genus`, `asfis_id`, `aphia_id`, `fishbase_id`, `gbif_id`, and `species_common_name_eng`.

Example:

species_scientific_name	genus	asfis_id	aphia_id	fishbase_id	gbif_id	species_common_name_eng
<i>Thunnus albacares</i>	Thunnus	YFT	127027	143	2374013	Allison tuna
<i>Thunnus albacares</i>	Thunnus	YFT	127027	143	2374013	Yellowfin tuna
<i>Thunnus albacares</i>	Thunnus	YFT	127027	143	2374013	yellow-fin tunny

- **Get Fishery Basic:** The [endpoint](#) needs at least a parameter to be passed. In VeriFish we use it for retrieving all fisheries with same Genus or all fisheries with same Species.

The parameters are:

- **species_code:** The code (e.g. 3Alpha) of the species of the fishery record.
- **genus:** The genus of the species of the GRSF record. Can be passed also other parameters like **gear_code**, **area_code**, **flag_code**, etc. to filter the results.

Example of Get Fisheries Basic for YellowFin Tuna:

https://demos.isl.ics.forth.gr/verifish/verifish-api/resources/getfisheriesbasic?species_code=YFT

```
[
  {
    "uuid": "8ab7d9ab-c9e2-4abf-9a87-eeb4f4d596d2",
    "short_name": "Yellowfin tuna | Indian Ocean | IOTC | Indonesia | Handlines hand operated",
    "semantic_title": "Thunnus albacares - IOTC - Indian Ocean Tuna Commission - Indonesia - Handlines hand operated",
    "semantic_id": "asfis:YFT+rfb:IOTC+authority:INT:IOTC+iso3:IDN+sfp:SFP-6",
    "status": "approved",
    "traceability_flag": true,
    "sdg_flag": false,
    "dissected_fishery": false,
  }
]
```



```
"species": {
  "species_code": "YFT",
  "species_name": "Thunnus albacares",
  "species_type": "asfis"
},
"fishing_gears": {
  "fishing_gear_code": "SFP-6",
  "fishing_gear_name": "Handlines hand operated",
  "fishing_gear_type": "sfp"
},
"flag_states": {
  "flag_state_code": "IDN",
  "flag_state_name": "Indonesia",
  "flag_state_type": "iso3"
},
"assessment_areas": [
  {
    "assessment_area_code": "IOTC",
    "assessment_area_name": "IOTC",
    "assessment_area_type": "rfb"
  }
],
"annotations": [],
"source_urls": [
  "https://www.fishsource.org/fishery_page/5217"
],
"traceability_unit_uuid": [
  "764f0b59-635f-3ac5-80e7-1f0eb2ae826f"
],
"faoMajorArea": null
},
{
  "uuid": "9e28b0e1-5aeb-434f-b2e3-117d538c66c8",
  "short_name": "Yellowfin tuna | Indian Ocean | IOTC | Seychelles | Associated  
purse seining",
  "semantic_title": "Thunnus albacares - IOTC - Indian Ocean Tuna Commission -  
Seychelles - Associated purse seining",
  "semantic_id": "asfis:YFT+rfb:IOTC+authority:INT:IOTC+iso3:SYC+sfp:SFP-15",
  "status": "approved",
  "traceability_flag": true,
  "sdg_flag": false,
  "dissected_fishery": false,
```

```
"species": {
  "species_code": "YFT",
  "species_name": "Thunnus albacares",
  "species_type": "asfis"
},
"fishing_gears": {
  "fishing_gear_code": "SFP-15",
  "fishing_gear_name": "Associated purse seining",
  "fishing_gear_type": "sfp"
},
"flag_states": {
  "flag_state_code": "SYC",
  "flag_state_name": "Seychelles",
  "flag_state_type": "iso3"
},
"assessment_areas": [
  {
    "assessment_area_code": "IOTC",
    "assessment_area_name": "IOTC",
    "assessment_area_type": "rfb"
  }
],
"annotations": [],
"source_urls": [
  "https://www.fishsource.org/fishery_page/5805"
],
"traceability_unit_uuid": [
  "a5db1c3d-6a10-3db6-9950-a3be16cd806b"
],
"faoMajorArea": null
}
]
```

Example of Get Fisheries Basic for Genus Thunnus:

<https://demos.isl.ics.forth.gr/verifish/verifish-api/resources/getfisheriesbasic?genus=Thunnus>

```
[
  {
    "uuid": "8ab7d9ab-c9e2-4abf-9a87-eeb4f4d596d2",
    "short_name": "Yellowfin tuna | Indian Ocean | IOTC | Indonesia | Handlines hand operated",

```

```
"semantic_title": "Thunnus albacares - IOTC - Indian Ocean Tuna Commission -  
Indonesia - Handlines hand operated",  
"semantic_id": "asfis:YFT+rfb:IOTC+authority:INT:IOTC+iso3:IDN+sfp:SFP-6",  
"status": "approved",  
"traceability_flag": true,  
"sdg_flag": false,  
"dissected_fishery": false,  
"species": {  
  "species_code": "YFT",  
  "species_name": "Thunnus albacares",  
  "species_type": "asfis"  
},  
"fishing_gears": {  
  "fishing_gear_code": "SFP-6",  
  "fishing_gear_name": "Handlines hand operated",  
  "fishing_gear_type": "sfp"  
},  
"flag_states": {  
  "flag_state_code": "IDN",  
  "flag_state_name": "Indonesia",  
  "flag_state_type": "iso3"  
},  
"assessment_areas": [  
  {  
    "assessment_area_code": "IOTC",  
    "assessment_area_name": "IOTC",  
    "assessment_area_type": "rfb"  
  }  
],  
"annotations": [],  
"source_urls": [  
  "https://www.fishsource.org/fishery_page/5217"  
],  
"traceability_unit_uuid": [  
  "764f0b59-635f-3ac5-80e7-1f0eb2ae826f"  
],  
"faoMajorArea": null  
}  
]
```

Gears, Water Areas and Countries



- [GET Gears with Occurrences](#): It retrieves fishing gear data as `csv`, including the following fields: `fishing_gear_code`, `fishing_gear_code_type`, `fishing_gear_name`, and `occurrences`.

Example:

fishing_gear_code	fishing_gear_code_type	fishing_gear_name	occurrences
9.39	isscfg	Longlines (nei)	2026
1.1	isscfg	Purse seines	1329

- **Get Fishing Gears and Species**: The [endpoint](#) retrieves information about fishing gears and their associated (through fisheries) species. This is used by VeriFish to show the fishing gears of a species or to filter the species by the fishing gear.

The parameters are:

- `species_code`: The code (e.g. 3Alpha) of the species of the fishery record.
- `genus`: The genus of the species of the GRSF record.
- `fishing_gear_code`: The code (e.g. 3Alpha) of the fishing gear of the fishery record.
- `fishing_gear_type`: The type of the identifier of the fishing gear.
- `fishing_gear_name`: The name of the fishing gear of the fishery record.
- `include_pending`: Include or not pending GRSF records in the results

Example of Get Fishing Gears and Species for YellowFin Tuna:

https://demos.isl.ics.forth.gr/verifish/verifish-api/resources/getFishingGearsAndSpecies?species_code=YFT

```
{
  "results": [
    {
      "fishing_gear_code": "09.5",
      "fishing_gear_name": "Trolling lines",
      "fishing_gear_type": "ISSCFG",
      "species_scientific_names": [
        "Auxis thazard",
        "Thunnus albacares",
        "Lutjanus spp",
        "Thunnus alalunga",
        "Thunnus obesus",
      ]
    }
  ]
}
```

```
    "Auxis rochei",
    "Nemipterus hexodon",
    "Katsuwonus pelamis",
    "Scomberomorus commerson",
    "Euthynnus affinis",
    "Serranidae"
  ],
  "genera": [
    "Euthynnus",
    "Lutjanus",
    "Auxis",
    "Thunnus",
    "Scomberomorus",
    "Katsuwonus",
    "Nemipterus",
    "Serranidae"
  ]
},
{
  "fishing_gear_code": "09.1",
  "fishing_gear_name": "Handlines and hand-operated pole-and-lines",
  "fishing_gear_type": "ISSCFG",
  "species_scientific_names": [
    "Katsuwonus pelamis"
  ],
  "genera": [
    "Katsuwonus"
  ]
}
],
"error_message": ""
}
```

Example of Get Fishing Gears and Species for Gear with 09.5 code:

https://demos.isl.ics.forth.gr/verifish/verifish-api/resources/getFishingGearsAndSpecies?fishing_gear_code=09.5

```
{
  "results": [
    {
      "fishing_gear_code": "09.5",
      "fishing_gear_name": "Trolling lines",
      "fishing_gear_type": "ISSCFG",
      "species_scientific_names": [
        "Auxis thazard",
        "Lutjanus spp",
        "Thunnus albacares",
        "Thunnus alalunga",
        "Thunnus obesus",
        "Auxis rochei",
        "Katsuwonus pelamis",
        "Nemipterus hexodon",
        "Scomberomorus commerson",
        "Euthynnus affinis",
        "Serranidae"
      ],
      "genera": [
        "Euthynnus",
        "Lutjanus",
        "Auxis",
        "Thunnus",
        "Scomberomorus",
        "Katsuwonus",
        "Nemipterus",
        "Serranidae"
      ]
    }
  ],
  "error_message": ""
}
```

[GET Water Areas with Occurrences:](#)



It retrieves water area data as `csv`, including the following fields: `area_code`, `area_code_type`, `area_name`, `total_occurrences`, `stock_occurrences`, and `fishery_occurrences`.

Example:

area_code	area_code_type	area_name	total_occurrences	stock_occurrences	fishery_occurrences
77	fao	Pacific, Eastern Central	2974	247	2727
71	fao	Pacific, Western Central	2698	15	2683
47.1.2	fao	Cape Salinas	1124	20	1104
47.1.1	fao	Cape Palmeirinhas	1124	20	1104
47.1.3	fao	Cunene	1122	19	1103

3.6. Wikimedia API

We are currently testing the integration of Wikimedia APIs to retrieve images and illustrations of seafood species that are not already available within the VeriFish Knowledge Base. These images are intended to complement the factual data with visual content, helping users, especially consumers, easily recognise and engage with the species featured in the app.

The Wikimedia API allows species names (in English or scientific format) to be queried against Wikipedia and Wikidata entries, retrieving relevant media assets along with metadata. Sample implementations have shown promising results in improving the visual appeal and usability of the species factsheets.

In order to get some drawings and specific images to show in the app, we develop a cloud function that operates like this:

- When a document from the species collection is updated the function searches for an article about the specific species using its scientific name

-
- If at least a page is returned by the API, the function starts to analyse the response, searching for an image and its url.
 - The url usually shows a small image about the fish, so the function processes the url in order to show a bigger image and saves it inside the document.

If it fails, the species uses a placeholder as its image in the application.

3.7. OpenAI API

In addition to Wikimedia, the mobile App relies on a suite of API integrations that enable various key functions like Multilingual & Localization Support.

To try to cover diverse European and international audiences and search in local names, the mobile app will support dynamic translation of content into multiple languages where the specific languages are not available in our Knowledge Base.

As part of an initial feasibility study, we are currently testing dynamic translation using AI-driven translation services. This evaluation aims to assess their accuracy, cost-effectiveness, and overall performance. At this stage, the dynamic translation feature remains experimental and is not available in production environments. Its potential deployment in a live setting will depend entirely on the outcomes of the ongoing assessment process.

The translation engine is integrated via API, allowing real-time language switching and automatic localization of species names, indicators, and descriptions.

Since OpenAI API costs depend on which model and how many tokens are used to process data, we decided to develop a “manual” cloud function to retrieve at least one common name for each important European language.

At first we studied the different kinds of AI models offered by OpenAI and we found out that the best one for price-quality ration was the **gpt-3.5-turbo-instruct-0914**.

The function works in this way:

1. It checks if the document needs to be updated. In order to do so, it checks if at least one of the languages is missing.
2. For every single species that needs to be translated it makes a request using a specific prompt.
3. The answer is basically the same for every single request (thanks to using the same prompt every time) so the function can easily parse the response. At first it cleans the response removing points, ordered number, -, and any spaces. Then it updates the FireBase with the new translation.

3.8. Indicator Framework visual representation

The visual representation of the scores derived from the VeriFish indicator framework is currently under active discussion within the project consortium. Our goal is to develop a visual system that conveys sustainability-related information in a clear, accessible, and non-prescriptive manner. Several concepts are being explored, including intuitive models such as a traffic light system, emoji-style smile indicators, or a more domain specific design like a coloured fish icon, which could progressively "fill up" to reflect the score attributed to each of the three pillars: environmental, socio-economic, and nutritional. The emphasis is not on issuing binary judgments (e.g., "buy/don't buy") but rather on empowering consumers with an easy-to-read, interpretative visualization that supports informed, responsible seafood choices. This design will aim to balance clarity with nuance, avoiding oversimplification while ensuring usability for diverse audiences.

Some examples/ideas:

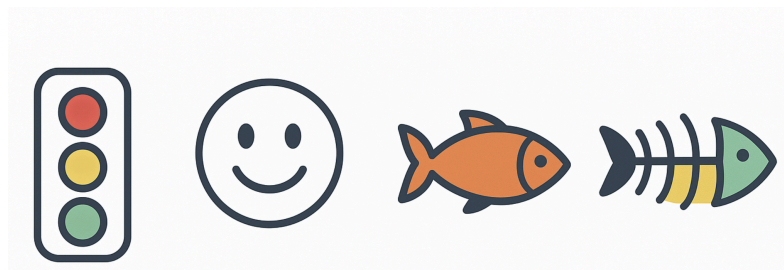


Figure 3 Example of a visual representation idea of the scores derived from the VeriFish indicator framework

3.9. Factsheet

The Species FactSheet serves as a core resource for communicating clear, verifiable information about individual fish and seafood species. These factsheets compile and present key biological, taxonomic, nutritional, and sustainability related data in a user-friendly format, tailored for both public awareness and professional reference. Designed to be both educational and accessible, the FactSheets support transparency along the seafood value chain and contribute to building trust through scientifically grounded and harmonized data.

The following table provides an overview of the data fields used in the VeriFish mobile application, along with brief descriptions and the sources from which each data point is obtained. VeriFish is designed to centralize essential biological and taxonomic information about species, offering a reliable reference for consumers.

3.10. Factsheet Species Fields Reference Table

Field Name	Description	Source
scientific_name	Unique name of the species	GRSF
genus	The genus of the species; can be shared across species with different scientific names	GRSF
3a_code	The 3A code of the species	GRSF
aphia_id	The APHIA ID of the species	GRSF
fishbase_id	The Fishbase ID of the species	GRSF
common_names_eng	Common name of the species in English	GRSF
danish_common_name	Common name of the species in Danish	OpenAPI
french_common_name	Common name of the species in French	OpenAPI
german_common_name	Common name of the species in German	OpenAPI
italian_common_name	Common name of the species in Italian	OpenAPI
norwegian_common_name	Common name of the species in Norwegian	OpenAPI
polish_common_name	Common name of the species in Polish	OpenAPI
portuguese_common_name	Common name of the species in Portuguese	OpenAPI
spanish_common_name	Common name of the species in Spanish	OpenAPI
swedish_common_name	Common name of the species in Swedish	OpenAPI
imageUrl	The URL of a representative image of the species	WikiMedia API and FishBase
fao_drawing	The FAO illustration of the species	FishBase
description	Biological and ecological description of the species	FishBase
habitat	The natural habitat of the species (e.g. saltwater, freshwater, brackish)	FishBase
iucn_categorization	IUCN Red List status (e.g., NT – Near Threatened, EN – Endangered, etc.)	GRSF
harmless	Indicates whether the species is considered harmless or potentially dangerous to humans	FishBase

Table 1: Factsheet Species Fields Reference Table

3.11. Example: Thunnus albacares (Yellowfin Tuna)

Field	Value
scientific_name	<i>Thunnus albacares</i>
genus	Thunnus
3a_code	YFT
aphia_id	127027
fishbase_id	143

common_names_eng	["Allison tuna", "Yellowfin tuna", "yellow-fin tunny"]
danish_common_name	Gulfinnet tun
french_common_name	Thon jaune
german_common_name	Gelbflossen-Thunfisch
italian_common_name	Tonno giallo
norwegian_common_name	Gulfinnet tunfisk
polish_common_name	Tuńczyk Żółtopłetwy
portuguese_common_name	Atum de barbatana amarela
spanish_common_name	Atún de aleta amarilla
swedish_common_name	Gulfenad tonfisk
imageUrl	Image Link
fao_drawing	Drawing Link
description	An oceanic species occurring above and below the thermoclines. Pelagic in open water , but rarely seen near reefs (Ref. 48637). They school primarily by size, either in monospecific or multi-species groups. Larger fish frequently school with porpoises, also associated with floating debris and other objects. Feed on fishes, crustaceans and squids. It is sensitive to low concentrations of oxygen and therefore is not usually caught below 250 m in the tropics (Ref. 28952, 30329). Peak spawning occurs during the summer, in batches (Ref. 9684, 51846). Eggs and larvae are pelagic (Ref. 6769). Encircling nets are employed to catch schools near the surface (Ref. 9340). Caught mainly with longlines and purse seines. Marketed mainly fresh, frozen, canned (Ref. 9684), but also smoked (Ref. 9987). Highly valued for sashimi (Ref. 26938).
habitat	brackish; saltwater
iucn_categorization	LC – Least Concern
harmless	harmless

Table 2: Factsheet example: *Thunnus albacares* (Yellowfin Tuna)

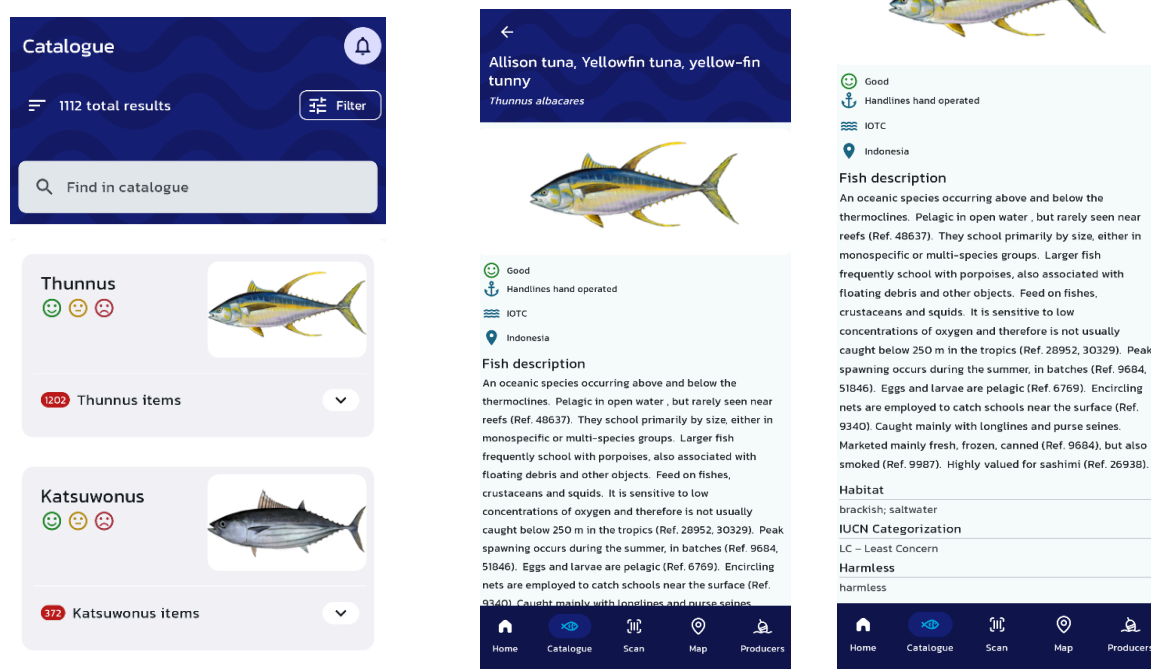


Figure 4 Factsheet demo from the mobile APP

3.12. Gear Fields Reference Table

Field Name	Description	Source
fishing_gear_code	The code of the fishing gear	GRSF
fishing_gear_code_type	The type of the identifier of the fishing gear	GRSF
fishing_gear_name	The name of the fishing gear	GRSF

Table 3: Gear Fields Reference Table

3.13. Water Area Fields Reference Table

Field Name	Description	Source
area_code	The code of the water area	GRSF
area_code_type	The type of the identifier of the water area	GRSF
area_name	The name of the water area	GRSF

Table 4: Water Area Fields Reference Table

3.14. Fishery Fields Reference Table

Field Name	Description	Source
short_name	The short name of the record	GRSF

Field Name	Description	Source
semantic_title	The GRSF Semantic Title of the record	GRSF
fishing_gears	The fishing gear used by the fishery	GRSF
assessment_areas	The assessment area	GRSF

Table 5: Fishery Fields Reference Table

3.15. Stock Fields Reference Table

Field Name	Description	Source
short_name	The short name of the record	GRSF
semantic_title	The GRSF Semantic Title of the record	GRSF
TBD	To be defined	

Table 6: Stock Fields Reference Table

In addition to the fields listed above, we will add other important fields such as **biomass** and **fishing pressure**. These variables will play an important role in the development of the **indicator framework** scoring system, although which fields will be used are still to be defined.

4. User Interface (UI) & User Experience (UX) Design

To ensure that the VeriFish Mobile App effectively communicates complex sustainability, nutrition, and biodiversity data to a broad spectrum of users including citizens, consumers, and seafood professionals, the design of the user interface and user experience is important. This section outlines the approach adopted to translate verified data into intuitive, accessible, and engaging digital interactions.

To support consistency, scalability, and responsiveness across different screen sizes and devices, the UI implementation will rely on Material Design 3, which provides a comprehensive design system, including layout, typography, and component behavior. This ensures optimal usability and visual coherence whether the platform is accessed on desktop, tablet, or mobile devices.

4.1. Design Principles & Accessibility Guidelines

The VeriFish mobile App's UI is based on Material Design 3 principles but heavily customised to meet the needs of the project. This approach ensures an intuitive and modern user experience while integrating visual elements and functionalities tailored to communicate complex data on seafood sustainability, nutrition, and provenance. The main wireframe in the next sections reflects a clean and user-friendly structure that prioritises easy access to key content such as seafood factsheets, recipe and data. The wireflow maps out a seamless navigation experience across the App's primary modules, including indicator exploration, user-friendly visualizations, and gamified media elements.

4.2. Wireframes & UI Mockups

Onboarding & log in/sign up wireframes

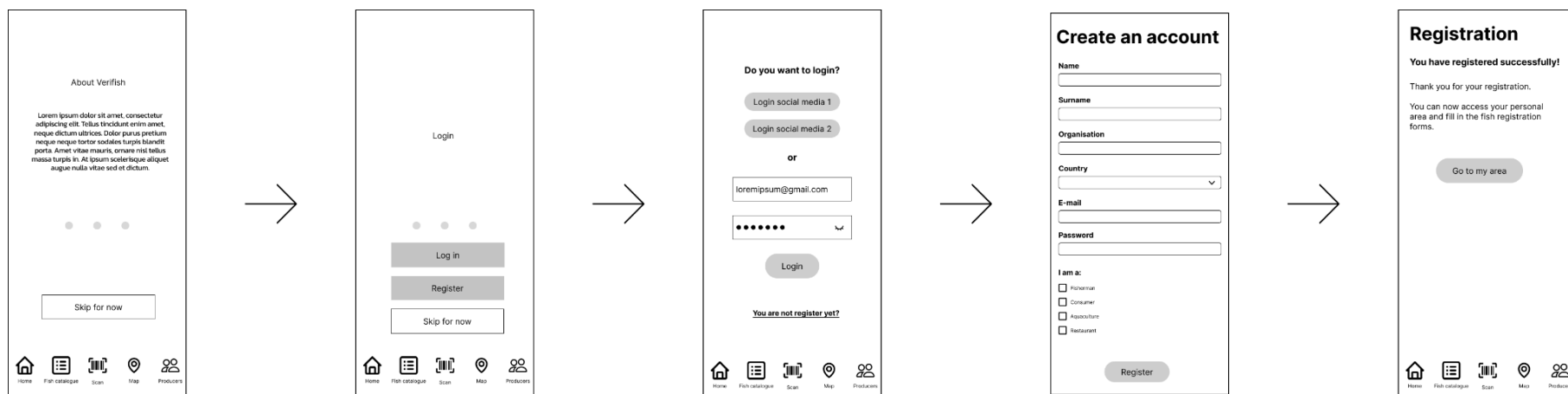
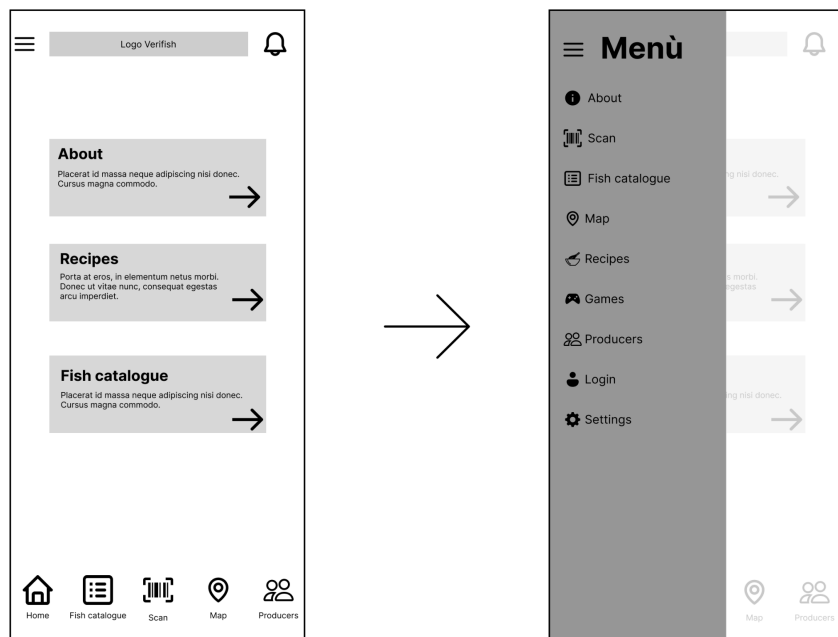


Figure 5 Onboarding & log in/sign up wireframes

Homepage and menu:



About/Static page:

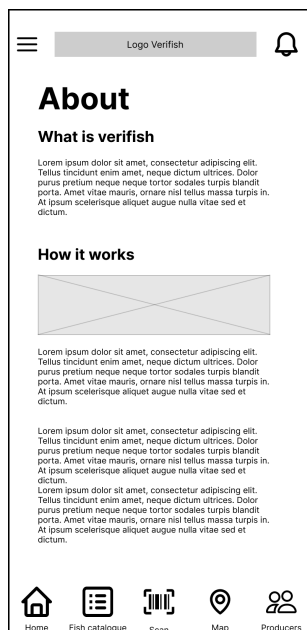


Figure 6 Homepage and static pages

QR Code and scan results:

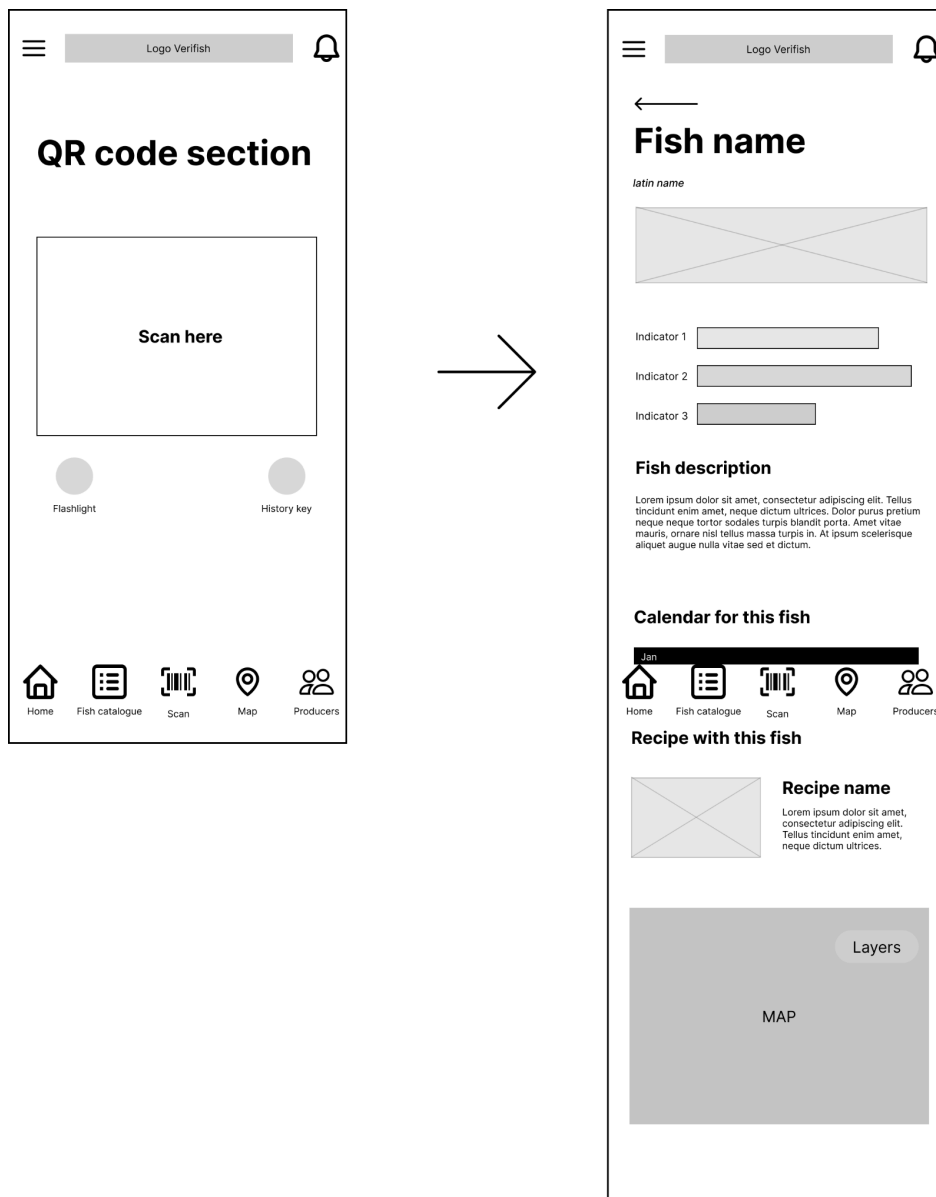


Figure 7 QR Code and scan results

Species catalogue:

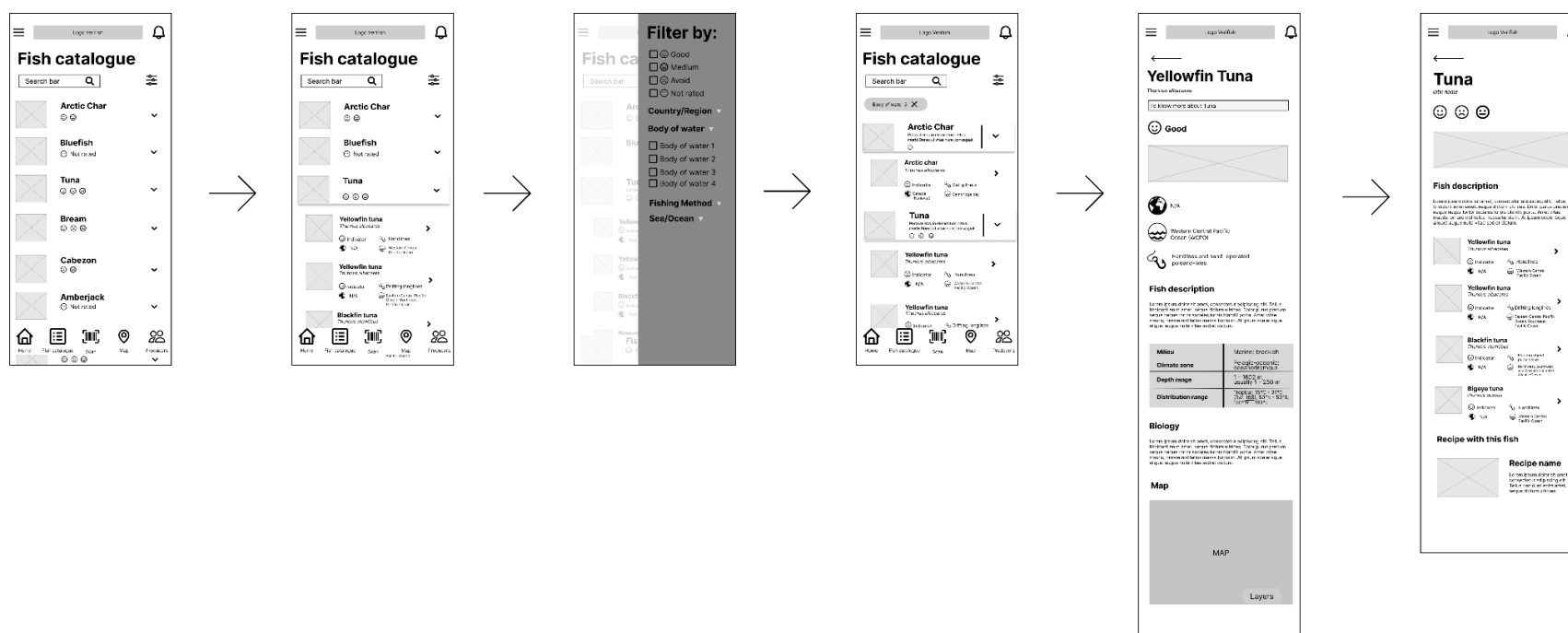


Figure 8 Species catalogue

Recipes section:

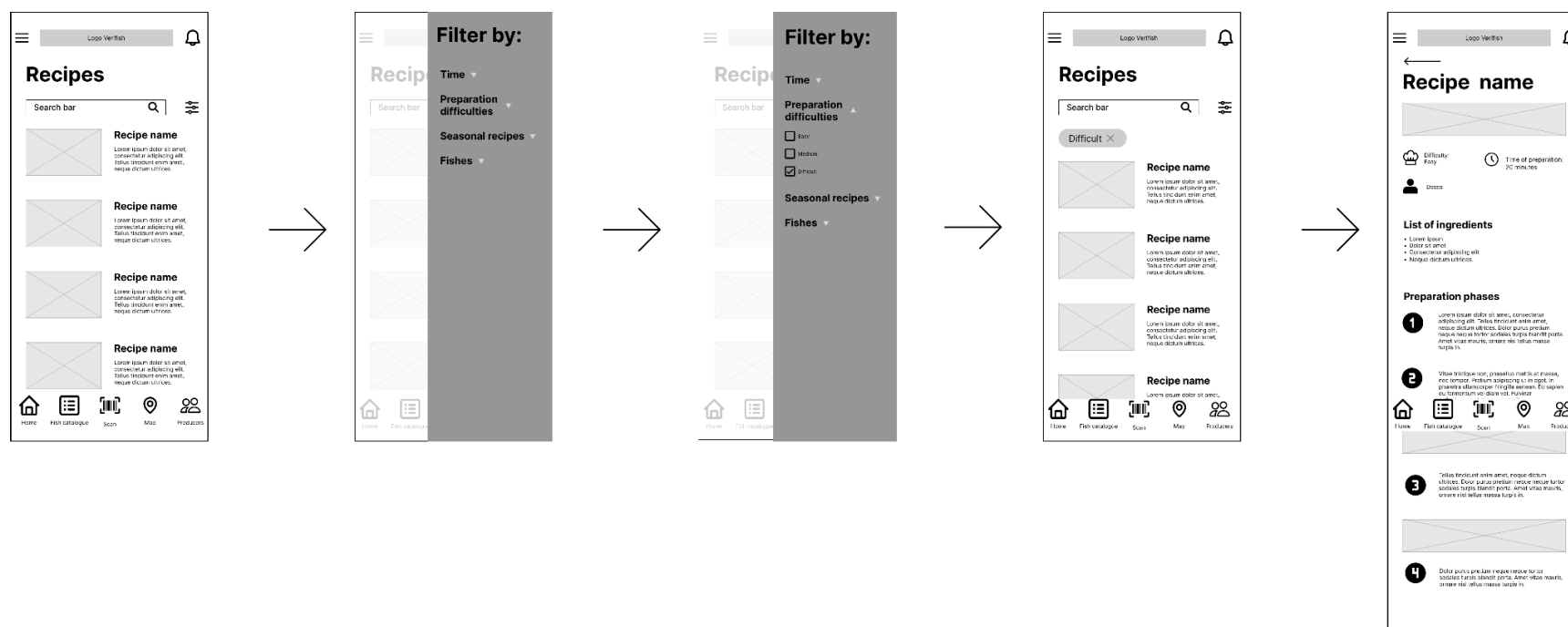


Figure 9 Recipes overview

Games section:

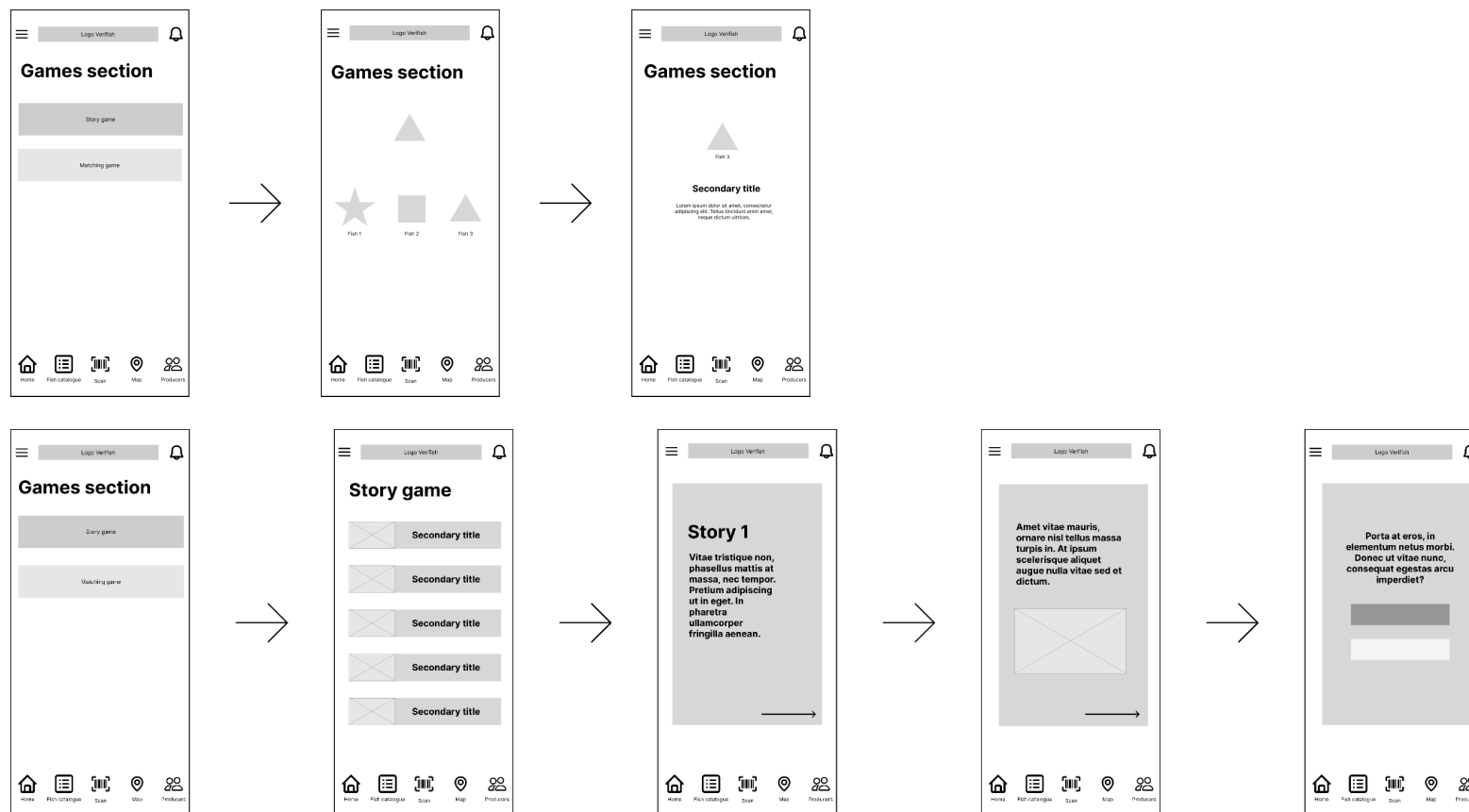


Figure 10 Games section

Settings screen:

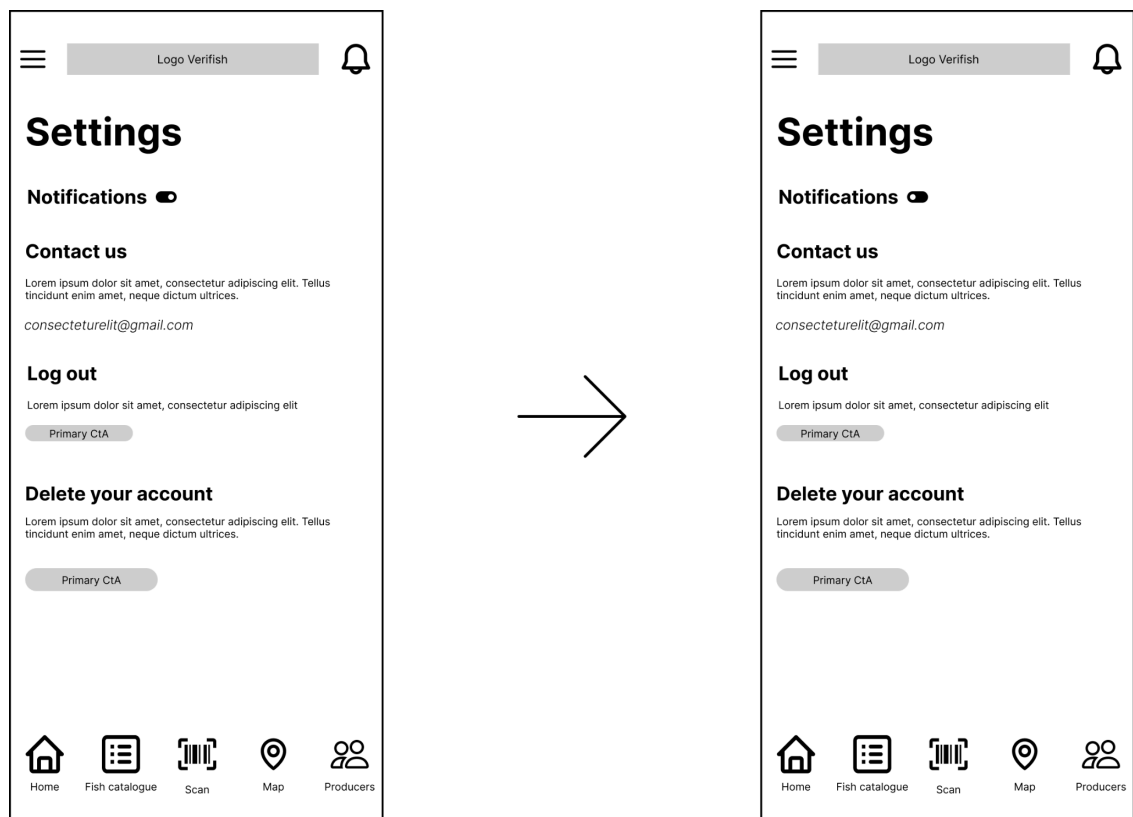


Figure 11 Settings & profile

Notifications section and notification detail:

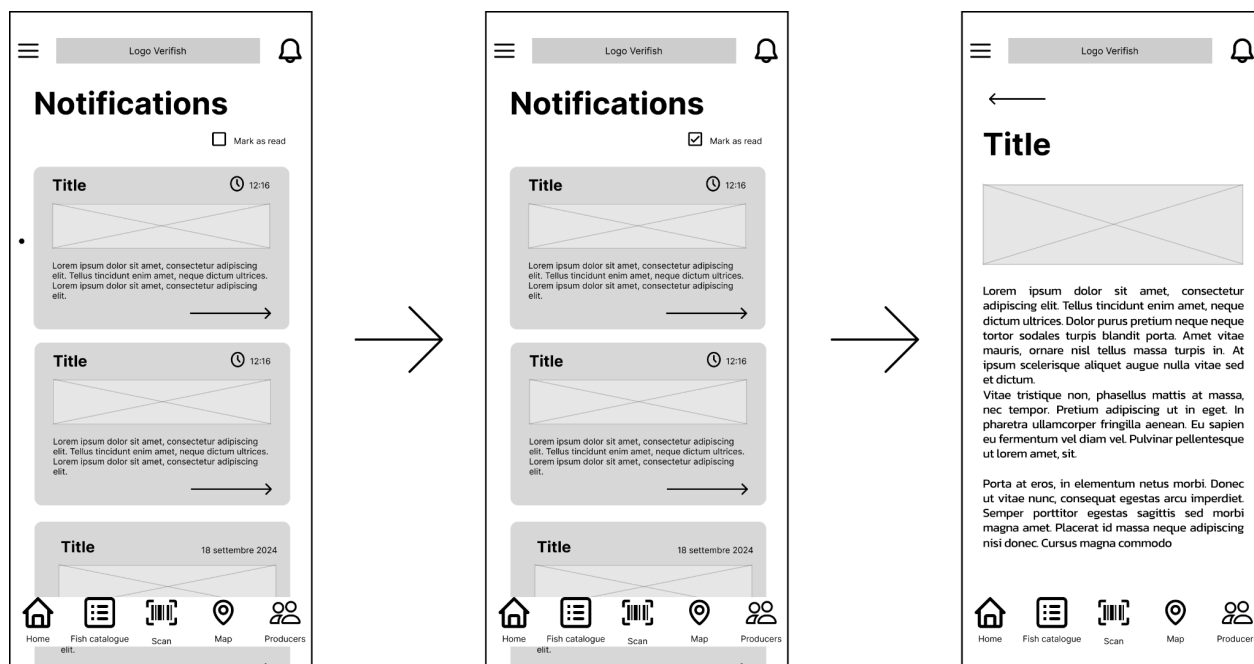


Figure 12 Notifications section and notification detail

4.3. Producer/Fisherman WireFrame

For easier navigation:

<https://www.figma.com/board/HJ4X3SKlyyo8o6GOkSNjhl/Verifish-Mobile-App-Wireflow?node-id=2051-206&t=OfIOiDKyXl6noU3U-1>

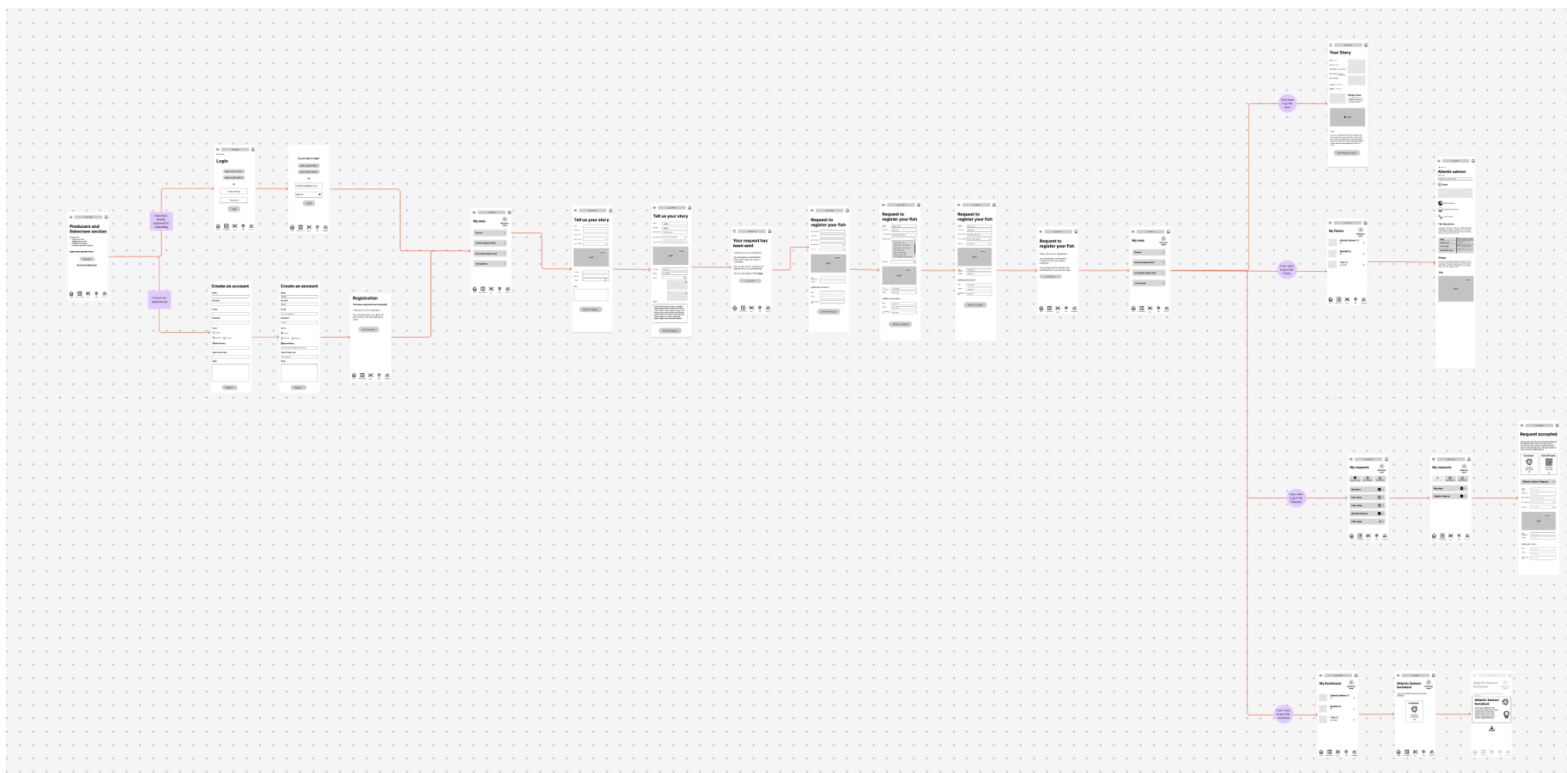


Figure 13 Producer/Fisherman WireFrame

Onboarding mockups:

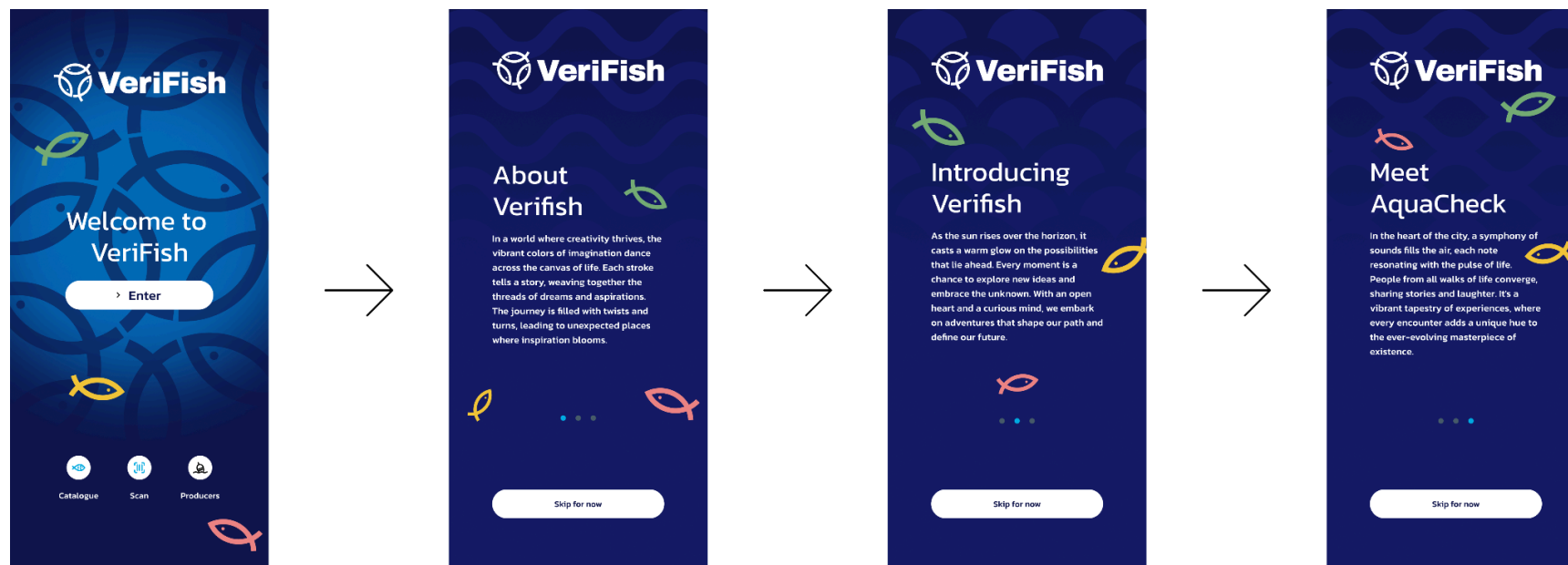


Figure 14 Onboarding mockups

Species catalogue mockups:

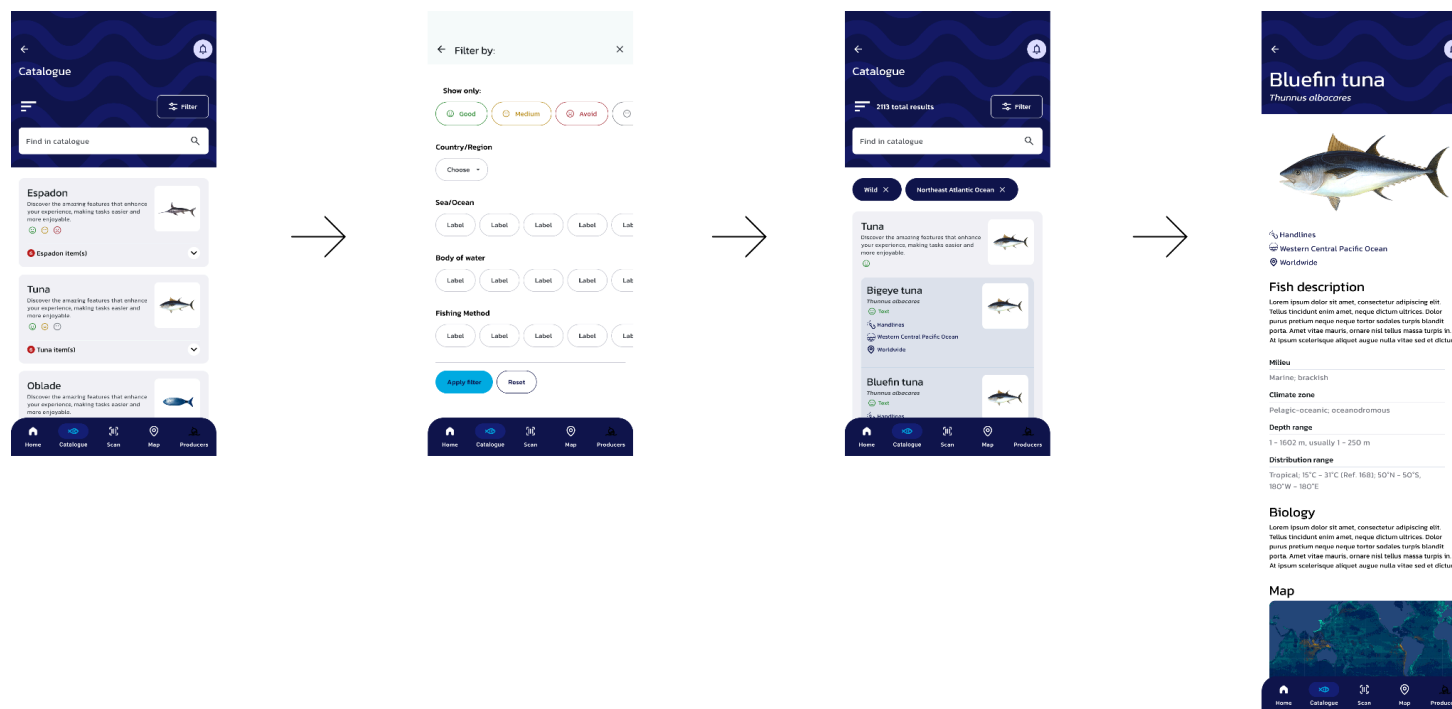


Figure 15 Mockups of the species catalogue

Species catalogue mockup on desktop/tablet platforms:

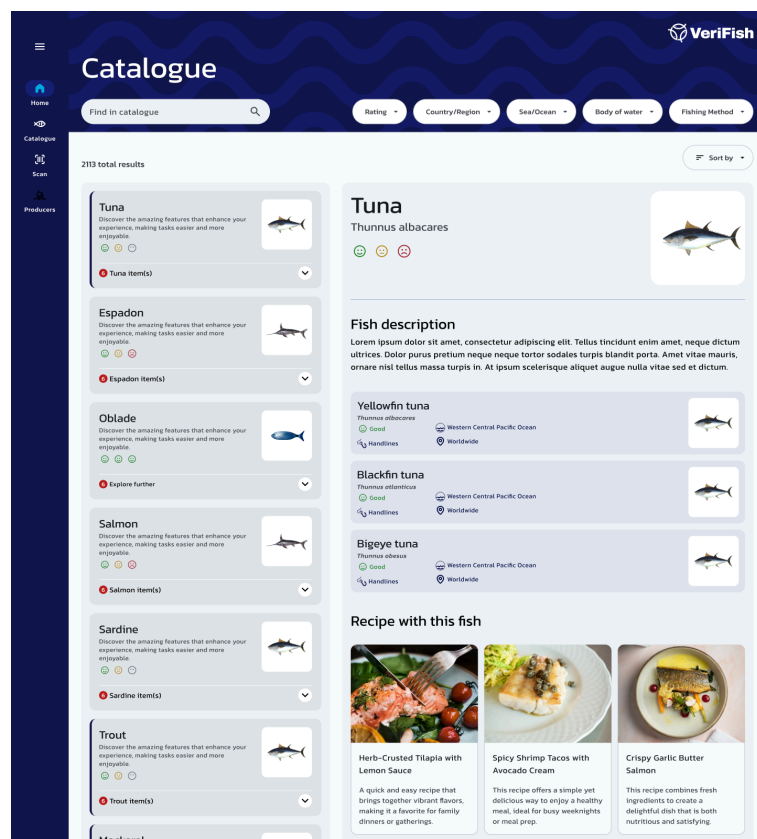


Figure 16 Desktop version of the species catalogue

4.4. Navigation Flow & User Journey

4.4.1. Generic user workflow

For easier navigation:

<https://www.figma.com/board/HJ4X3SKlyyo8o6GOkSNjhl/Verifish-Mobile-App-Wireflow?node-id=89-159&t=T75TOaZ5mOKkQOij-1>

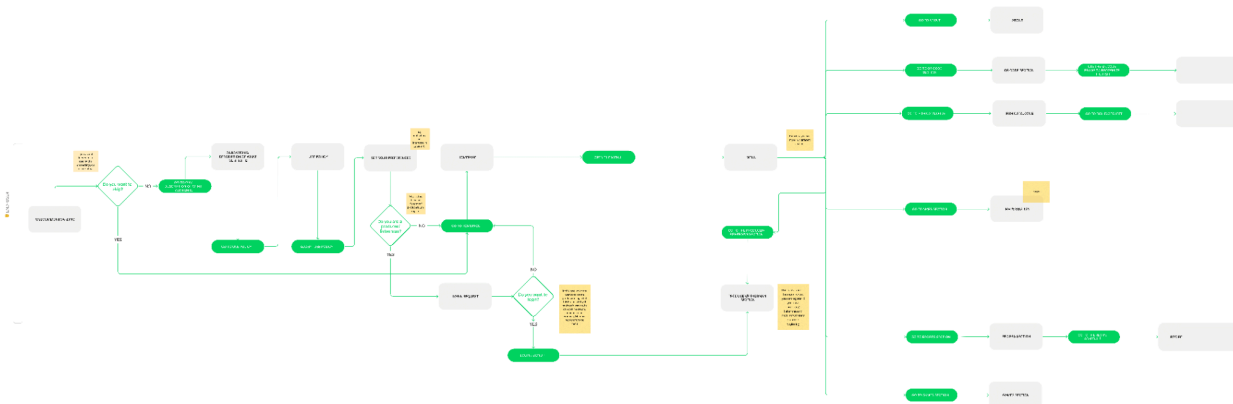


Figure 17 Generic user workflow

This is the entire wireflow of the app and how a user can navigate through it.

When the application is launched for the first time, the user is greeted by an initial setup screen. At this point, they have two options: follow the guided onboarding process or skip it. If skipped, the user will be redirected directly to the homepage. If they choose to proceed with onboarding, they will be guided through an overview of the VeriFish project, including a description of its goals, policies, and terms of use. During this process, the user can also set their preferences, such as notification settings and preferred continent.

Next, the user is asked whether they are a fish producer or a fisher. If the answer is no, they will be redirected to the homepage. Otherwise, they can access the “Fisher Area” by logging in or registering an account within the app.

The app currently includes five main sections, accessible from the main menu. Please note that the menu is still in draft and subject to changes. One planned addition is the ability for fishermen to submit and share their stories through the app.

Here are the current sections:

- **About:** Provides information about the VeriFish project and the app.

- **QR Code:** Allows users to scan a QR code to identify the fish species used in a product.
- **Fish Catalogue:** Enables browsing of the VeriFish catalogue with detailed information about each fish.
- **Recipes:** Displays a list of recipes that can be made with one or more types of fish.
- **Games:** Offers a description and links to the media product developed in VeriFish.

4.4.2. Producer/Fisherman Workflow

For easier navigation:

<https://www.figma.com/board/HJ4X3SKllyo8o6GOkSNjhl/Verifish-Mobile-App-Wireflow?node-id=89-159&t=T75TOaZ5mOKkQOij-1>

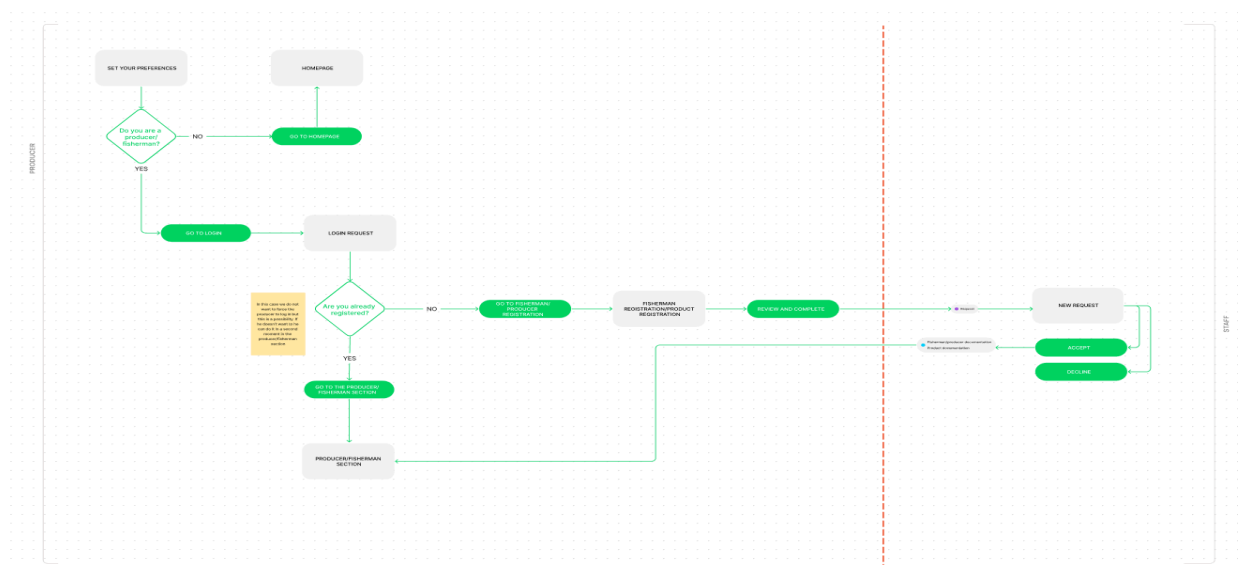


Figure 18 Producer/Fisherman Workflow

5. Next steps

While this deliverable outlines the foundational structure and main components of the VeriFish Mobile Application, it is clear that a number of detailed requirements still need to be discussed, refined, and fully defined in the upcoming phases of the project. The architecture and key functional areas described here form a solid starting point for development, but further collaborative input from stakeholders and technical partners will be essential to ensure the application meets the diverse needs of its target audiences. The work documented in this deliverable provides the core framework upon which future iterations will build.