OLFISH - A complete, paperless solution for the collection, management and dissemination of marine data

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1. Introduction

Fisheries management is continually frustrated by the lack, or poor quality, of critical data on fishing operations (catches, duration, gear, locations and relevant environmental conditions). While quantitative methods for managing fisheries have developed with considerable complexity, the quality of the available data remains an obstacle for meaningful advances in fisheries management. There are a number of aspects to the problem, not all of which are technical. A culture of protecting catch data and disinformation is common amongst fishers, fishing companies and even formal state-run offices, and significant education is needed in order to change this culture.

Another problem is the poor quality of historic data in many fisheries around the world. Much energy is wasted and important opportunities lost because of the uncertainty surrounding crucial historic data. For example, there are typically many factors related to catch-per-unit-effort data, a key index of trends in resource abundance, which are not recorded, and hence cannot be incorporated into statistical analyses. Frequently, these missing data are crucial to management decisions. For scientists, unreliable data leads to a poor basis for stock assessment models and management programs. For industry, the lack of sound data significantly reduces its fishing efficiency, since past performance cannot be studied properly. As a result, poor management decisions based on unreliable analyses are made, often with substantial cost and risk to fish resources and the fishing industry.

Although there is presently greater awareness amongst scientists and fisheries managers about the importance of collecting fishing data, there is still confusion about exactly which data are needed, and how to collect and store them. It is common for skippers to record scientific data on one form, for shore managers to use another for commercial purposes, and for skippers to keep separate fishing logbooks. These data are then transferred to different computer systems, often complex spreadsheets, or, sometimes, are left in paper format in large, inaccessible books and files. There is a degradation in the quality of data because of the multi-stage process of transcription from handwritten logbook sheets to paper forms and then to computer databases.

So even when good will is present, technically, the absence of a flexible and comprehensive system for capturing essential data during fishing operations is a major obstacle. A large amount of logistical and environmental data is lost simply because of the difficulty of recording this information easily in real time. This is despite the advent of a complex array of sensory equipment available in the bridge of modern fishing vessels. As a result, environmental patterns become part of a skipper's experience and seldom, if ever, become formally available to scientists or managers of fishing operations.

The most logical first point of data entry, through the fishing vessel skipper, should occur in digital format directly into a computer. One of the difficulties with fisheries data is the complexity of the logical linkages between the different types of data. Any reasonable approach to the problem requires the use of modern relational databases which are able to address the multidimensional complexity of the problem.

In order to address many of the problems described above, Olrac (www.olrac.com) a South African company, has developed a data collection and management system it has named Olfish (www.olfish.com) for the specific use of operators and managers in the marine environment with a special focus on the commercial fishing industry.

2. Electronic Logbooking

2.1 Benefits

An obvious approach to the "data crises" is to bring modern data and information technology (Elog) to the marine environment in general, and to the commercial and recreational fishing industry in particular. Providing fishers with accurate yet easy to use data logging tools could potentially transform the entire fishing fleet and the fishers community into the largest surveyors group of the marine environment in the world. The calibre of data produced through electronic logbooks has the potential to benefit all sectors of the fishing industry, from the fishers themselves to seafood consumers, resource managers, scientists and government enforcement agencies in between. In addition, the international shift towards a greater emphasis on output control measures, such as annual catch limits (ACL's) and total allowable catches (TAC's), requires the implementation of sophisticated catch monitoring tools in order to allow for a near-real-time auditing of catch versus TAC. However, it is important to note that the benefits of electronic data logging go beyond merely adhering to regulations. It is crucial for the industry to realise that it will ultimately be the greatest beneficiary of accumulated good quality data. A few obvious benefits derived from the collection of a large amount of accurate data in a near-real-time environment are:

2.1.1 Better Stock Assessments

The accuracy and timely delivery of electronically recorded data will allow for more exact indications of catch in a current year. In the past, due to the delays of paper-based reporting, incomplete data from preceding years has been used to estimate the TAC of the following year. The uncertainty associated with such calculations has resulted in conservative stock assessments which lead to overly restrictive TAC's. This means that there is often an over-discard of fish which would otherwise be commercially viable. Electronic data logging would allow for up-to-date and accurate data to be used for TAC estimation, thus eliminating much uncertainty and adding weight and justification to the TAC's allocated.

2.1.2 Better Targeting and Gear Utilization

The security and verification features of electronic logbooks, (see Security and Data Integrity – 5.4.7 below), as well as multimedia photographic and video utilities (see Multinote Taker and Notebook – 6.2 below), can potentially replace the role of an observer onboard a vessel. This can then be adapted into an incentive scheme for improved gear and fishing-ground selectivity, thus reducing unintended bycatch. Capturing target species may also lead to a decrease in days at sea, which is often beneficial for the skipper.

2.1.3 Faster Transmission

Faster transmission of information from sea to shore allows for "on-time reaction", i.e. decisions made on a regulatory, managerial, commercial or environmental basis are relevant to what is actually happening at sea. Back-logged, non-electronic reporting means that any event at sea is only registered on shore sometimes up to several weeks after it has occurred. Responding to month-old information, particularly in an ever-dynamic ocean environment, is practically pointless. Faster transmission will have a substantially positive effect on, for example, quota management, conservation and even commercial decision-making.

2.1.4 Catch Prediction and Management

Built-in analytical tools available within electronic logbook software (see Olfish Explorer - 6.4 below) are able to harness historical information stored in their electronic databases to help fishers calculate and predict fish migration, fishing hotspots etc. This greatly increases efficiency in a number of fields, such as targeting areas and the selection of fishing grounds and techniques. Similarly, fishers will be able to avoid "dry" areas, maximizing their time at sea and ultimately reducing discarding rates.

2.1.5 Traceability

Traceability is the ability to locate the source and "journey" of a fish from ocean to supermarket shelf. Legal organizations, such as the Marine Stewardship Council, prohibit fish without certification logos from entering the market. Such logos are obtained through traceability, i.e. proving that the fish in question had been caught in a certified area under certified conditions. Electronic data logging makes traceability a simple and speedy process. Information from the vessel at sea can be efficiently transmitted to market authorities who can then clear the catch for sale. Furthermore, electronic data logging allows for a highly detailed recording of catch information. Thus, catch freshness can easily be proven, increasing its market value. Buyers then benefits from being able to accurately estimate the shelf-life of the product they have bought. None of this would be possible without verifiable and immediate traceability.

2.2 The Olfish System: A Short Overview

Olfish is a third-generation, data logging and data management, software tool which was initially developed for the commercial fishing industry, but now provides a complete solution for the collection, management and reporting of other vessel-based activities, such as commercial and recreational fishing trips, oceanographic surveys, marine inspections, cargo and service trips, surveillance missions, etc.

The present version of Olfish includes three basic components in order to cater for the entire data flow, from at-sea collection to the generation and dissemination of reports.
The onboard, data collection component named Olfish Dynamic Data Logger (Olfish-DDL) is a standalone data collection tool installed onboard the vessel's PC.
Olfish-DDL also has a shore component which is identical to the vessel version but allows data from many vessels to be stored and viewed on one user-interface. This component is available in two versions:

a. A Single Fleet unit that aggregates operational data from vessels of a single company or organisation.
b. A Meta-Shore unit, which can aggregate operational data received from many shore units. The Meta-Shore unit can be used by a government agency, fishing association or even a union of states to manage data from a number of countries/states.

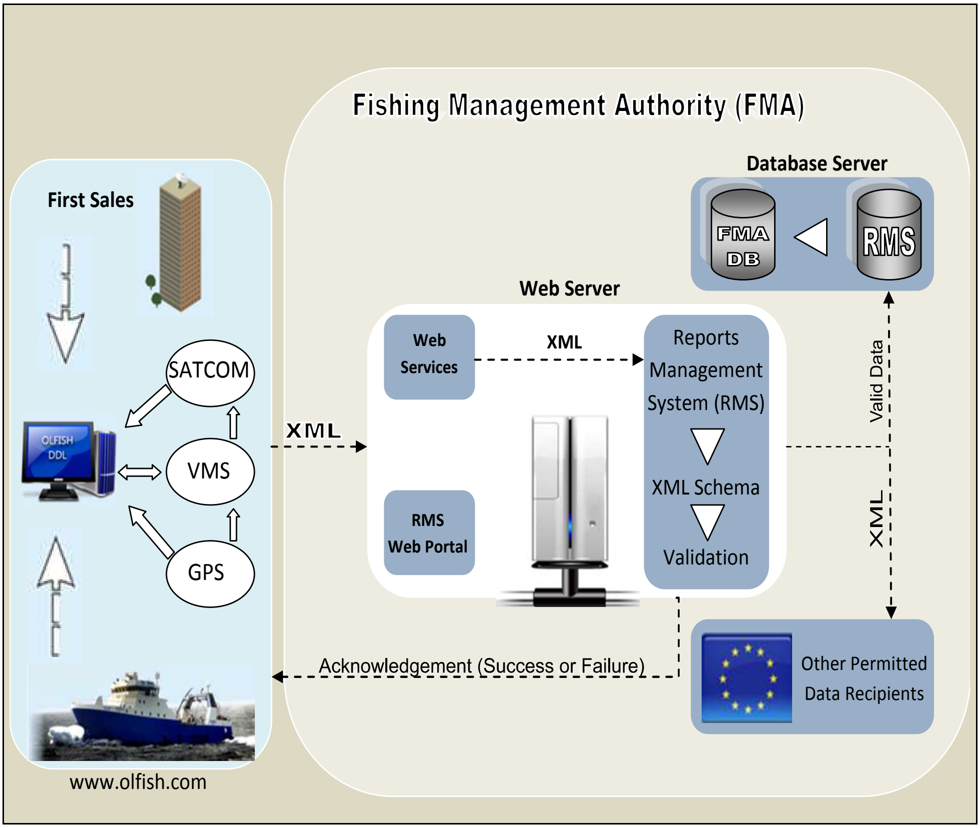

Fig. 1. Overall structure of the Olfish data collection and management system

The third component of Olfish is a web application named Olfish- Report Management System (Olfish-RMS™) and its main function is to receive, store and disseminate reports coming from Olfish-DDL (or, if necessary, other, third party, data logging systems). Olfish-RMS also allows for the direct entry of data via an internet interface for cases where the use of an onboard data-logger is not practical (cost or unsuitable working environment). With Olfish-RMS the entire fleet of vessels can be managed. It includes a vessel registry, a full quota management system and an elaborate administrative component which allows Olfish-RMS to be customised to satisfy many needs.

2.3 Olfish Dynamic Data Logger

2.3.1 Basic Functionality

Olfish-DDL is a touch-screen-ready utility that captures data in real-time and/or after the fishing activity has taken place. Olfish-DDL can read GPS input via an additional GPS logging utility and it incorporates GIS capabilities for easy viewing of vessel movements and other operational fishing data. With Olfish-DDL, the user can collect any type of data in any form. These include images, video clips, numerical and alphanumeric fields, free text comments, date, time, location, etc. Olfish allows data to be inserted from guiding images ("infograph") to guide it through complex data entry needs. Each mode of data entry has its own unique data entry interface, specifically designed for the type of data recorded. Olfish-DDL is highly customisable and can be easily modified to address vastly different data recording and reporting needs.

Fig. 2. Olfish vessel unit on a tablet PC

2.3.2 Overall Structure

Olfish-DDL consists of the following:

- Configuration files defining levels, fields, parameters
- Database for working data
- Database for archived data
- User interface elements: Data Entry, Data Browser, Mapper, Data Centre, Mini Reporter, Explorer
- Input/output modules for the following types of data:
  a. Reports to specific agencies and third-parties
  b. Import / export of operational data
  c. Backup of the complete system
  d. Error / exception handling reports to Olfish Support

There are two main levels of configuration in Olfish-DDL:

User interface: This is a developer-level configuration which governs the way the command bar menu (Dynamic Commands Bar – DCB) functions, based on client specific needs.

Field and lookup values: As a business model, Olrac ships Olfish-DDL with as many predefined fields as possible. However, within Olfish-DDL, the user can:

- modify field parameters, such as: display names, maximum and minimum values, set mandatory and carry over fields, capture on start/on end, make visible etc. Olfish-DDL ensures that changes which could affect underlying data capture logic are not allowed.
- hide and show lookup table records.
- add, edit and delete lookup table records.
- add fields – these fields have as much functionality and legitimacy as any original predefined fields.

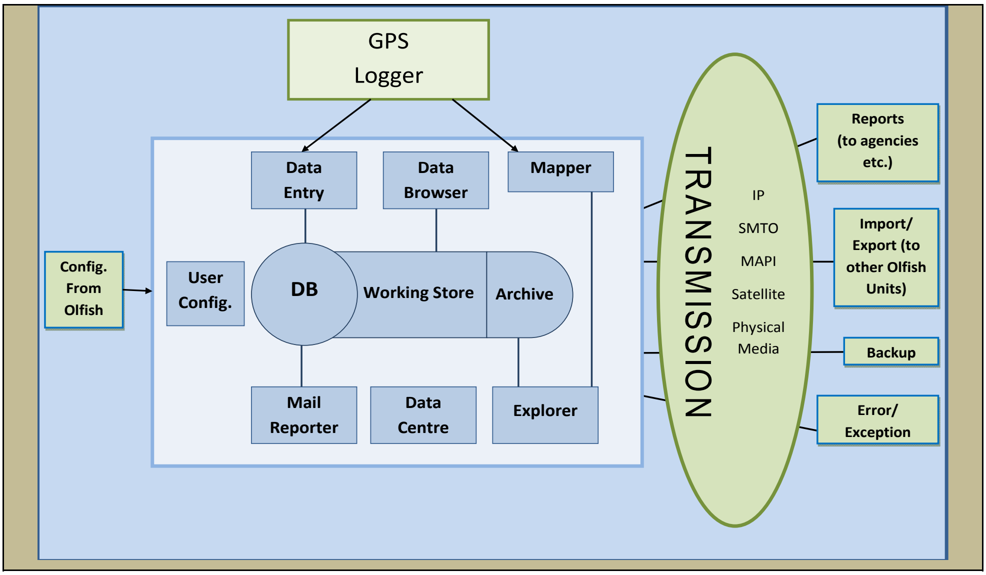

Fig. 3. Olfish-DDL basic structure

Olfish-DDL makes extensive use of dropdown lists whenever possible. The use of dropdown lists to enter data helps to maintain data integrity, thus minimising typos and saving time. However, new fields and values can be added by users if necessary.
While Olfish-DDL is normally shipped with the client's basic user configuration, it can be easily configured to fit the "taste" and needs of different users of the same basic configuration. With Olfish-DDL, the user can decide which fields should be visible, which are compulsory and which are remembered from previous entries. The user can also decide which data fields should be visible in which phase of the vessel operation. Examples are 'trip start', 'trip end' and, within a trip activity, 'start' and 'end'. Olfish-DDL also allows users to set up upper and lower limits for any numerical field in order to reduce the chance of typos.

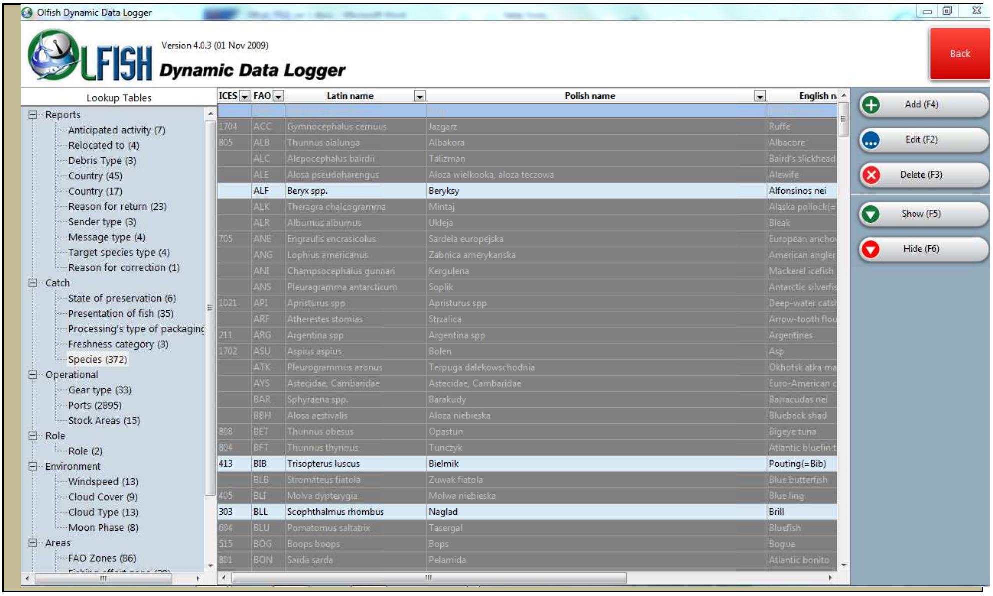

Fig. 4. Olfish-DDL lookup table customisation form

Another feature of Olfish-DDL is a Dynamic Commands Bar (DCB) which can be configured to "intelligently" guide the user during its data logging activities. The DCB can be configured to reflect data logging actions of vastly different activities. For example, the same basic underlying user interface can have different DCBs and can be used to collect data for totally different forms of fishing (trawl, longline, purse seine, traps, etc.) or other vessel activities (sea-farms maintenance, cargo delivery, coastal guard patrols, oceanographic surveys, etc.).

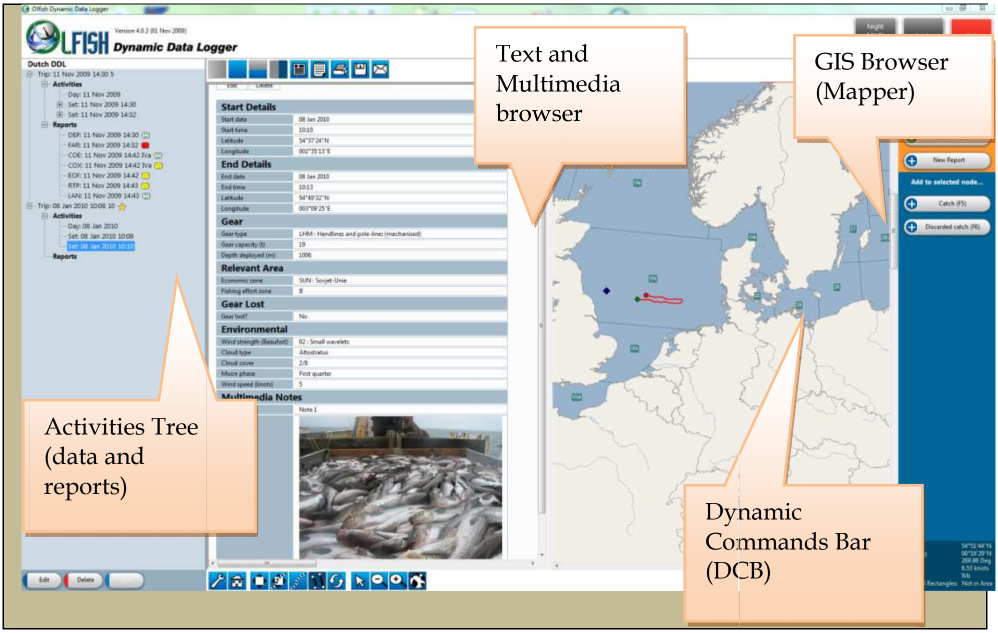

Fig. 5. Olfish-DDL main dashboard screen

Olfish-DDL has been designed to be a highly customisable data logging tool. However, under certain circumstances, it is undesirable to allow the user to change the basic configuration and customisation pre-setup. With Olfish-DDL, it is possible to prevent unwanted configuration changes in cases where data definition is strictly controlled by a higher level management body (examples are: company head offices, management agencies, scientific program managers, etc.). In such cases, it is possible to "hard" configure Olfish-DDL and constrain the user's ability to hide or ignore certain fields. This is mainly done in order to "force" uniformity and full data logging execution when Olfish-DDL is used for regulation-controlled data logging activities.

Data collected by Olfish-DDL can be used to generate any type of report in any format (XML, HTML, CSV, PDF, etc.). These reports can be saved and transferred to other databases (such as Olfish-DDL shore version, Olfish-RMS or other third party databases) either directly, using portable storage devices, or in real-time using the onboard VMS (Vessel Monitoring System) or other onboard satellite communication systems.

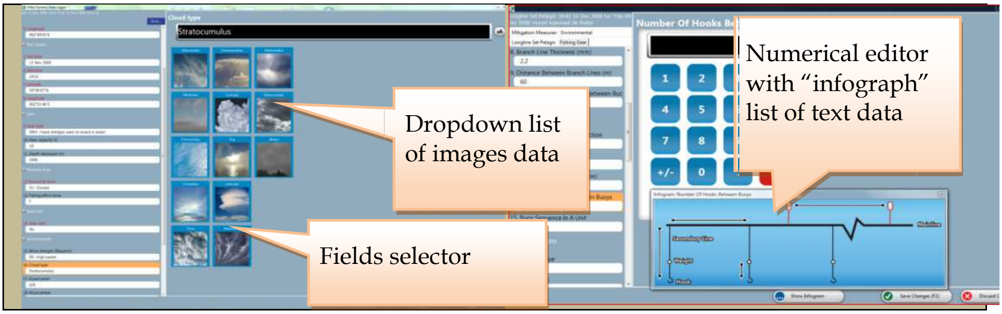

Fig. 6. Examples for Olfish-DDL Data Editor

2.3.3 GPS-Logger

Olfish-DDL can plot vessel movements and trips and set tracks, as well as automatically fill in date, time and location and other GPS related fields, if it has access to a GPS unit. The GPS unit can either be a VMS transponder or a standard GPS outputting NMEA strings on a serial or USB connection.

The Olfish-DDL application does not, in fact, talk directly to the GPS unit. Rather, a small, "light-weight", stand-alone application runs continually on the computer hosting Olfish-DDL. This application is the GPS-Logger, developed by Olrac. Olfish-DDL communicates with this GPS-Logger via a simple application programming interface, allowing all the low-level interfacing with the various GPS units to be handled exclusively by the GPS-Logger. This means that only the GPS-Logger application needs to be updated as Olfish develops support for new GPS or VMS units.

Another advantage to having the GPS-Logger run continuously is that it still logs GPS information even if Olfish-DDL is not running. Olfish-DDL can then use this logged information to provide marker values by means of a small "time machine" utility, when marker data are needed during non-real-time data recording activities. The data stored in the GPS-Logger can also be used to plot vessel tracks even if the user has not actively recorded GPS points.

The GPS-Logger can actually read any serial port information and can be extended to extract data from any set of NMEA 0183 sentences. This allows the GPS-Logger to record not only GPS information, but also any information outputted by devices conforming to the NMEA standard. These devices could include many analogue sensors such as echo sounders and anemometers amongst others.

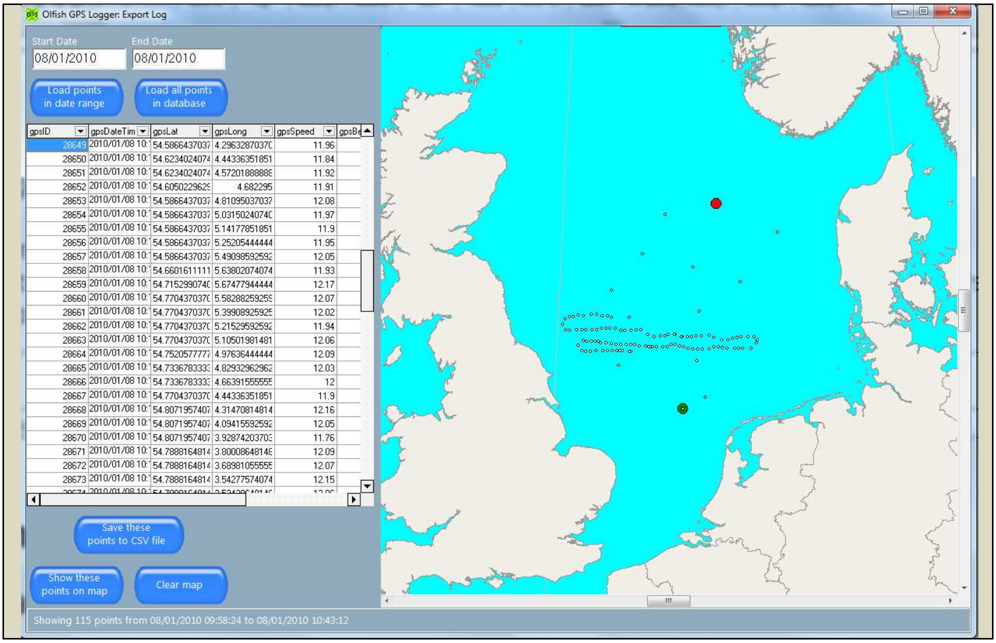

Fig. 7. GPS-Logger

3. Data Management Approach

3.1 Real-Time Activities and Events

Olfish-DDL data classes can be grouped into the following three kinds:

Activities – the data class encapsulates an activity, that is, something that has a start time and location as well as an end time and location. The combination of time and location properties is called a Marker. Examples include Trips, Shots, Sets, Hauls, etc.

Events – the data class encapsulates an event, that is, something that is of short (negligible) duration or has duration of no interest, and recorded as a single temporal point. Examples include placing a trap and retrieving catch from a long-line hook.

Non-spatial, non-temporal data – the data class encapsulates data without time or space markers. Examples include catch records and gear details.

The vessel unit of Olfish- DDL allows for the “real-time” data entry of activities and events, guiding the user in data entry to ensure a linear sequence of events (as they happen). For example, only once a trip has been started can a fishing operation be started, and only once a fishing operation has been started can catch events and catch be recorded. With Olfish-DDL it is possible, however, to switch off the “real time” mode and to enter data at “post event” mode when it might be more convenient for the user to do so. In non-real time mode the entire operation data can be captured on one form in any order desired by the user. In this mode it is assumed that the user will read his/her data from other data logging platform(s) such as a paper logsheet, spreadsheet, or even form memory. However, in order to ease data entry in non-real time mode, the user can access the entire GPS-Logger database and, for example, enter vessel location at any particular time by simply pointing at the relevant date/time point in the GPS-Logger database. This utility in Olfish-DDL is called the "Time Machine".

3.2 Data Storage

The initial Olfish configuration defines this hierarchical data structure of classes and fields, as well as operating parameters for each level and field. Olfish-DDL uses a hybrid approach to data storage. It uses XML files to store "active" trip data during vessel operations and relational databases to store historic data ("MS Access" on the onboard PC and MySQL on the shore unit PC). Active trip data can be archived into the storage database once the trip has ended and un-archived back, anytime, if any editing is needed (Olfish-DDL does not allow archived data to be edited directly and it is possible to block data from being un-archived if there is such a request). Regardless of which database is used, the database structure is always kept in synchronization with the configuration of the user-specific version of Olfish-DDL. This is necessary, as configuration may change (either by updates from the development team or configuration and customisation changes by the user). On start-up, Olfish-DDL compares the data store structures with the configuration and automatically reconfigures the structure, if necessary and without data loss, to bring it into alignment with the configuration.

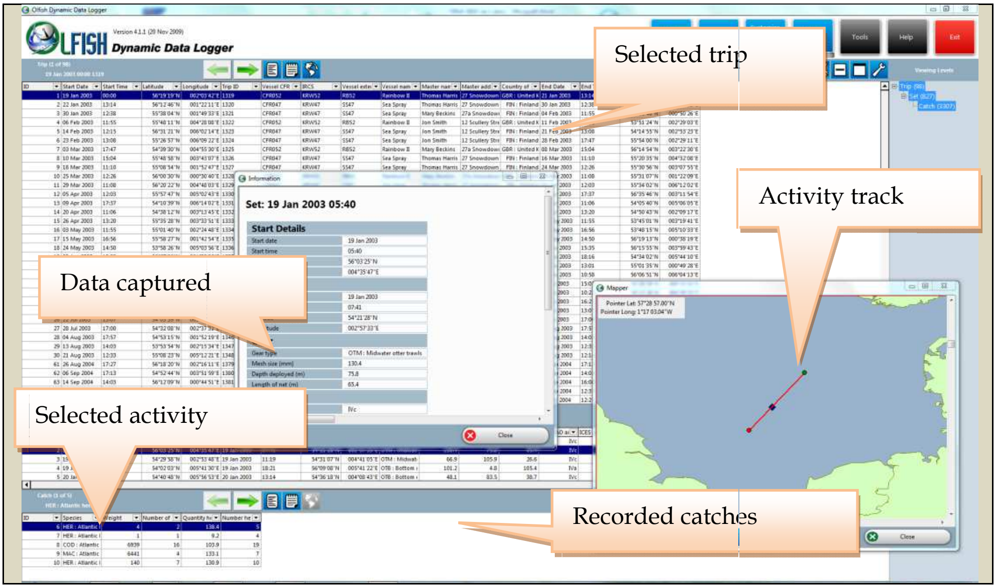

Fig. 8. Olfish-DDL main database interface (Data Centre)

All data captured by Olfish-DDL are organised into classes (or levels or tables). Each class has fields and a set of children classes. For example, one Olfish-DDL might let the user capture information for levels called Trips (a term often used to define the period between vessel departure and return) Sets (a defined activity within a trip), and Catches. A Trip class can have many Sets and a Set can have many Catches. Each class can contain any number of fields. Typical fields for a Trip could be, for example, Departure Date, Departure Time, Departure Port and Skipper Name. Possible Set fields could include Start Time, Start Latitude, Start Longitude, Gear Used, etc. Possible Catch fields include Species Caught, Weight, Products, etc.

4. System Configuration

4.1 The Need for Flexibility

An electronic logbook is not and cannot be a simple "off-the-shelf" product. Apart from multiple discrepancies within the fishing industry (differing regulations for different countries, different vessel-types, fishing methods, gear, targeted species etc.), the product must also cater for the data logging needs of conservation groups, observers and recreational fishers, to name a few. A rigid software configuration would be unable to adapt itself to the unique data recording requirements of each party. It is therefore necessary that any Elog tool be highly customizable, either at a developmental or user level. In this way, each company or organization will have a logbook configured specifically for its recording needs, with only the fields, input data and report types relevant to its operation appearing on the interface. Such configuration prevents clutter and confusion, and ensures maximum accuracy regarding data collection and transmission.

4.2 Editing Field Properties and Adding New Fields

The user can define new fields either on the vessel or on the shore units. These field definitions are then added to the configuration store, in the same manner as the Olfish-defined fields. These user fields are therefore then indistinguishable from fields defined by Olfish. Olfish-DDL automatically updates the database structure in accordance with these new field definitions.

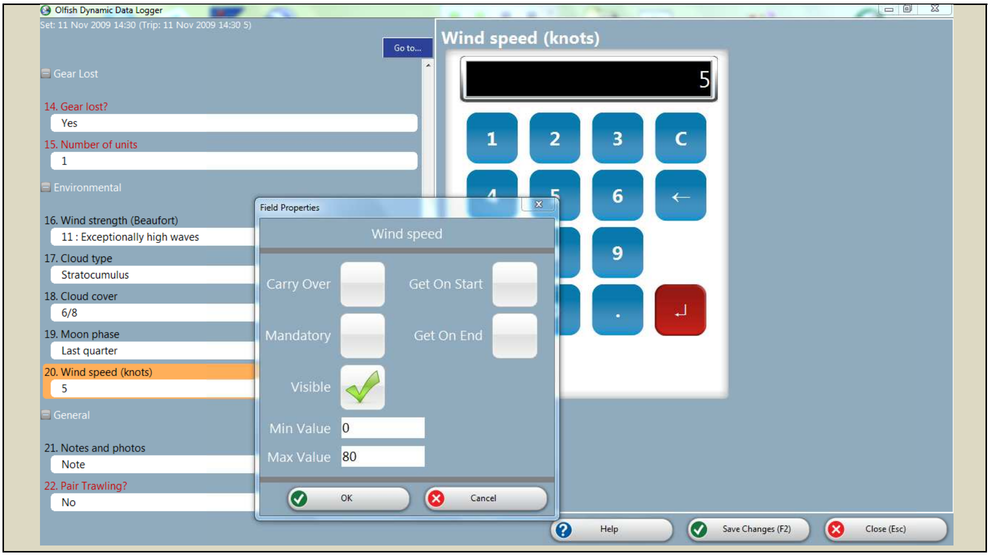

Fig. 9. Olfish-DDL user configuration form

When data is exported, new field definitions are included in the export file. Then, during import on the target system, Olfish-DDL adds the new fields to the configuration store and updates the database, providing a suitably configured data store for all the data in the imported file.

5. Reporting

Faster transmission of accurate data from vessel to land-based authorities can allow for near–real-time quota management. Current paper-based data-logging systems cause serious delays regarding quota calculations. In order for the quota allocation to ensue, data needs to be submitted, cross-checked and processed, a procedure which, using current data-logging techniques, may take up to a few months. This can substantially influence the last few months of a fishery, where delays in data reception can lead to some quota not being taken or, in the eyes of many, even worse: to be over- taken. Without updated knowledge as to how much quota has been thus far consumed, quota calculations have to be over-conservative and fishers often find themselves ultimately not reaching their entire quota. An electronic dat-logging system, which allows for near real time data entry and submission, and which can communicate via the web with all necessary authorities, reduces transmission time to days (see Web Based reporting, 7 below). Fishers will be able to use up their entire quota confidently, as it will be managed by near-real-time, good quality data. Similarly, management decisions will then also be made in near-real-time, decreasing the risk of over-fishing, as quota deficiency can also be identified and prevented in time.

5.1 An Ecosystem-Based Approach to Fisheries Management

A global move towards a more conservation-directed fisheries management system is underway. In the past, the only preventative measure which vessels were bound to take, regarding ecosystem conservation, involved using only approved gear types. There was very little surveillance and research done on the effect of the non-target-species by-catch on the ecosystem. This is changing. A paper from the Joint Nature Conservation Committee (Pope, J. G. & Symes, D. 2002) of the UK lists a few of the new regulations which are to be implemented in order to achieve this change. Amongst them:

- Scientists are required to provide ecosystem impact assessments alongside the advice on fisheries management options;
- Scientists are required to establish limit reference points for all target and non-target species within the ecosystem and managers should determine the best fishing practice to guarantee minimum levels of disturbance to the ecosystem;
- Fisheries managers are required to take all necessary actions to ensure that damage to the ecosystem (viz. excessive non-target species mortality and degradation of marine habitats) is not caused by intensities or forms of fishing activity beyond those required for rational and responsible exploitation of target species within commercial fisheries. In effect, this will require most - if not all - fishing effort to be reduced to levels commensurate with limit reference points.

Achieving such goals is dependent on the ability to collect data other than retained catches. These should include non-commercial and commercial by-catch, sea-bird and marine mammal interactions, impact on benthic species, detailed information on gear used and many others. For such a quantity and variety of data, paper logbooks are hopelessly inadequate.

5.2 Real-Time Management

Another advantage of electronic logbook near-real-time reporting is the ability to report trial fishing results (common in mixed species pelagic fisheries) almost immediately. The outcome of such trial fishing can determine if permission to fish is giving or not. Such permission, if not granted immediately (when supported by catch results), can compromise the ability of fishers to fish the discovered shoal of fish since pelagic shoal are often dispersed or move away in a very short time. Presently, it common that the time-lapse between the provision of catch results and the warranty of permission is too long and fish shoals disappear before the vessel is given an opportunity to fish them. Through near-real-time reporting, a sample-catch report can be sent, received, analyzed and responded to in time for the resource to be properly exploited.

5.3 Security

Finally, electronic reporting, able to harness the latest in encryption technology, can heighten report confidentiality and security to the maximum. Near real time reporting means that little time lapses between event and report delivery, thus minimizing any opportunity for tampering with the report by third-party “messengers”. Furthermore, not only can reports themselves be encrypted, but access to the reports can be restricted through the use of unique codes and passwords.

5.4 Reporting Through Olfish

5.4.1 Data Transmission Process

Data collected by Olfish-DDL can be transmitted to the shore in two basic forms:

- Raw, original data
- Summarized reports

In principle, Olfish-DDL transmits original data only to its shore mirror units while other data recipients receive data in a summarised form as a report.

With Olfish-DDL onboard, groups of vessels can “export” vessel data to different local companies/agencies (each running an Olfish shore unit) and the local companies can report in turn to a global company/agency running an Olfish meta-shore unit. Operational data can only flow from the vessel units to the shore units. Configuration data (lookup table records, field display names, new field definitions and field properties such as max, min values and mandatory, carryover status) can flow in either direction (from vessel to shore or from shore to vessel). This is illustrated in Figure 10 below.

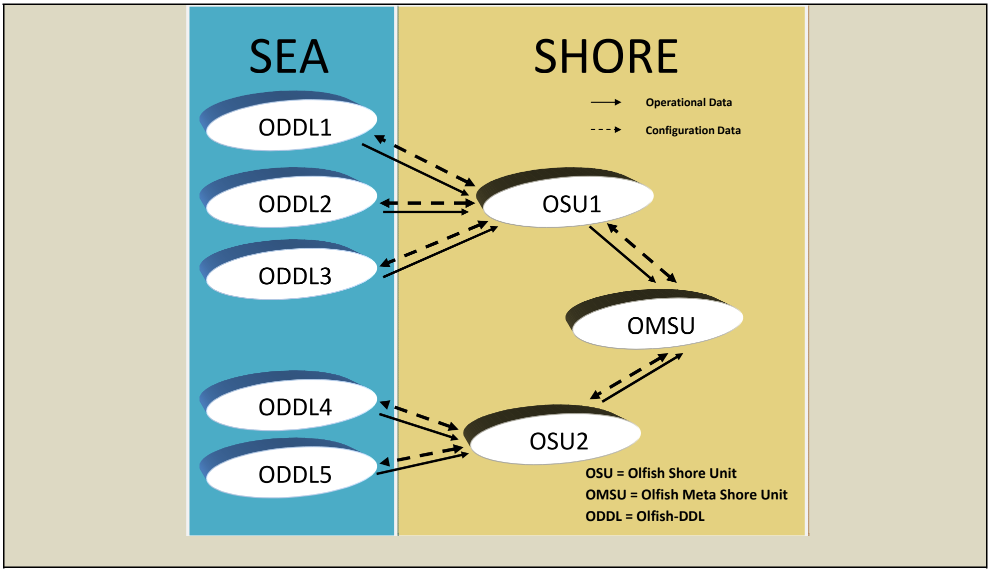

Fig. 10. Data flow between Olfish-DDL vessel units to Olfish-DDL shore units

5.4.2 Reports Transmission Process

Olfish-DDL can also generate specific reports as required by the regulatory bodies and compliance agencies. These specific reports use only a subset of the operational data recorded by the onboard unit. The recipient's of these reports can be either or both Olfish-RMS and other, third party, databases (European ERS for example).

The flow of reports amongst all these entities is configurable and can be customized to match different requirements. Implementations can include one or several of the following:

- Vessel units exporting all operational data to the shore unit. The shore unit then extracts and generates relevant reports for Olfish-RMS or other agencies.
- Vessel unit generates reports and sends them to Olfish-RMS. These reports can be accessed via the internet by permitted users directly or can be passed to other agencies' and/or countries' Reports Management Systems.
- Vessel unit generates reports and sends directly to other agencies' databases.
- Olfish-DDL can compile reports required by commercial clients for their own internal use. However, reports can also be used by any other authorised data recipients such as: compliance agencies, scientific and conservation groups and any other permitted third party commercial or non-commercial data recipients. Eligible third party data recipients can receive data selectively based on their needs and permission level.

Olfish DDL can provide output in a generic (native) XML or CSV format, or can comply with regulations and XSD schemas. Examples of management agencies whose regulations and schemas have been implemented by the Olfish-DDL are: EU regulations (EU 1077/2008), AFMA (Australian Fisheries Management Authorities) regulations etc.

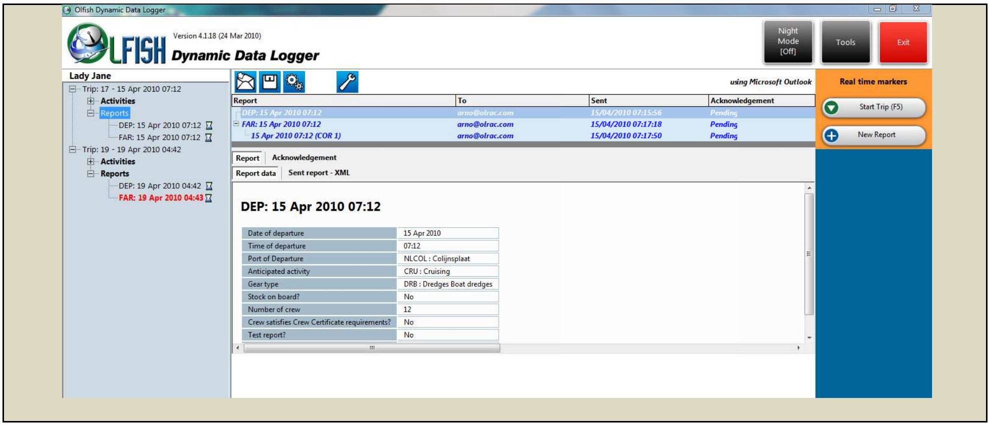

Fig. 11. Report Manager

In addition Olfish- DLL can generate output reports as PDF, HTML, BMP files or even as formal hardcopy logheets as may be required by the compliance authorities.

Reports can be generated automatically by predefined triggered events such as the crossing of certain geographical lines and date/time signals or manually by the user as required. Once generated, reports can be saved to a report queue, viewed, edited, sent and resent. The user can view the reports in legible HTML format or as XML or CSV before sending them out.

Reports can be compressed, authenticated and encrypted to fit any set of transmission requirements. For example, Olfish-DDL can implement secure, end-to-end transmission protocol that allows users to transmit secure XML reports, using X.509 digital certificates according the W3C XML security standards.

In addition to XML or CSV reports, Olfish-DDL can generate reports in the form of SQL scripts (with embedded data) that load the data into the third party database directly, without the need for a front end data loader tool.

Reports can be sent as email attachments, embedded text in the email message or as saved files on any mobile storage container. Olfish-DDL can also send data via a secured, dedicated FTP port if this is the preferred or required transfer mechanism.

Olfish-DDL includes an administrative module for the creation and mailing of predefined reports. These include agency compliance reports as defined by the EU regulations (EU 1077/2008), the Australian Fisheries Management Agency (AFMA) regulations and other management agencies (Poland, Holland, New Zealand, Canada and the USA amongst others).

Sending a report from Olfish-DDL to a third party on the shore can involve some or all of the following steps (Figure 12 below):

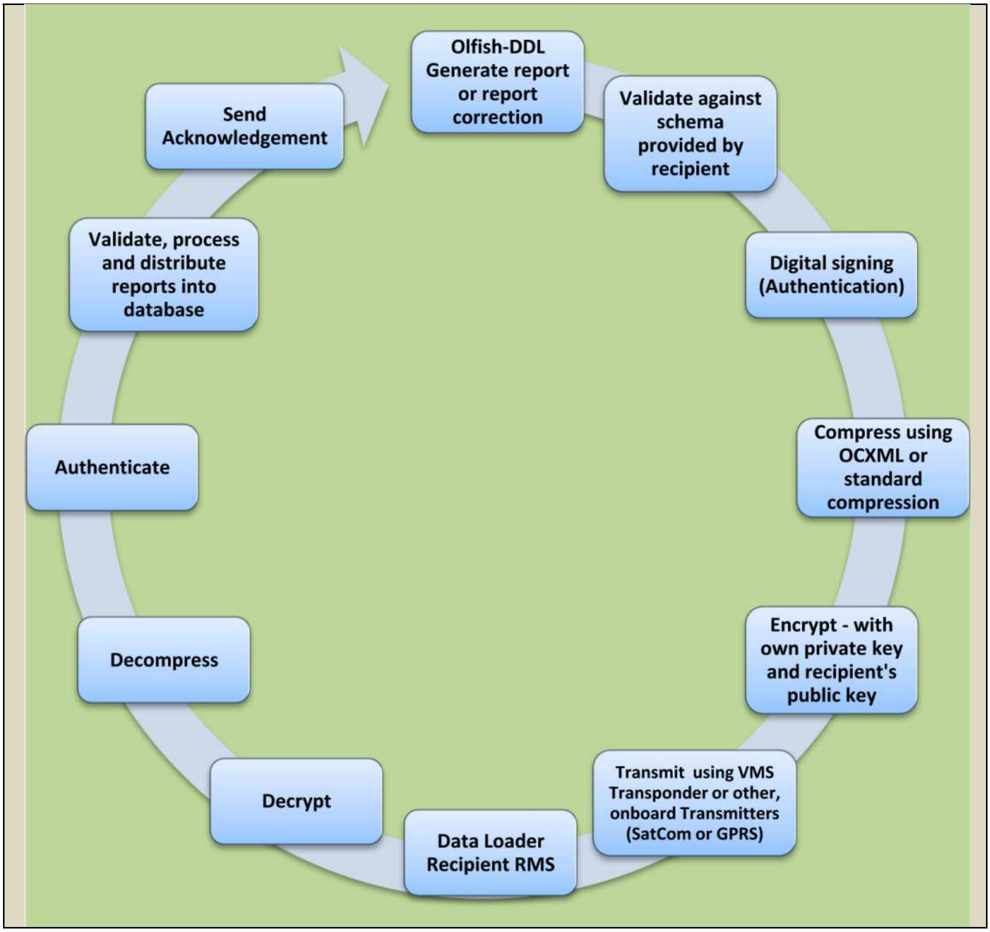

Fig. 12. Transmission process from Olfish-DDL to Shore-RMS

Olfish-DDL can, potentially, generate reports in any format which the client requires. Currently, formats catered for are XML and CSV. Olfish-DDL uses XSLT 2.0 to generate reports in XML format. In Poland, where the shore Reporting Management System was also developed by Olrac Olfish-DDL, EU and Polish specific reports are generated as XML files, which are then compressed as OCXML before being sent to the Polish RMS. On the shore these files are decompressed using ODCXML before validation and data integration take place. Once the reports are validated and processed successfully, a success message is sent back to the sender Olfish-DDL. If the report is not processed successfully, an error message is sent back to the sender, along with a reason for the process failure.

5.4.3 Correction Reports

Olfish-DDL makes a very clear distinction between data and reports. Data is information such as catch, gear used, fishing time, etc. which is captured in a raw (original) form by