



ELECTRONIC FISHING LOGBOOKS

Data transfer to Department of Agriculture,
Forestry and Fisheries

ABSTRACT

Proposal to streamline the recording, transfer and capturing of fishing data

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Summary

Modern era fishing involves an ever increasing amount of information flowing between vessels, shore offices, and regulatory authorities. Maintaining the various paper logbooks onboard vessels is very time consuming and open to transcription errors. Fisheries management is continually frustrated by the poor quality of data on fishing operations.

Digital technology can help to make this process more manageable. Electronic logbooks will result in a simplification of work for both the harvester and regulatory authorities and therefore there is no reason for not approving them.

The document focus specifically on the transfer of data to DAFF after the data was captured into a software system onboard the vessel or shore office once the vessel has landed. The aim is not to restrict fishing companies to a specific software application, but to guide them on the options available to them as far as moving the data to DAFF is concerned.

This document is intended to be used as a base document that can guide the fishing industry in the acquisition or development of E-LOG applications and will be developed with the support from the South African Department of Agriculture, Forestry and Fisheries (DAFF).

This document is a work in progress and will ultimately defines the characteristics, processes and best practices to be taken into account during the development or acquisition of electronic logbook client applications. The document will be continually revised as discussions between the various stakeholders move forward.

Introduction

Section of the <Fisheries Act> requires that fish harvesters keep a log of their catches and their fishing efforts and submit this information to DAFF.

Fishing companies record data on fishing activity by individual vessels by trip, and for each day of activity within a trip. This includes details of the catch, by species, in terms of the presentation and quantity of fish retained on board. Information is also collected on the species targeted and the area where the fish were caught.

Landing declarations completed by fishing companies provide the final information on the weight and presentation of fish landed by species. This information as well as information from log sheets completed at sea is keyed into computers connected to the main databases by government staff.

Fisheries administration operates a system of checking the individual submissions of data to ensure their accuracy and completeness. These checks are to ensure that valid data are reported within the returns and that internal checks within the submitted data are carried out to ensure consistency. In addition there are systems in place that carry out cross-checks between the activity data reported and other sources of information on activity. These include satellite position reports and data collected by on-board observers.

Benefits of digitization

Replacing existing manual logbooks with electronic ones opens a completely new era in both the fisheries business and the efforts for conservation of the resources.

Vessel owners and skippers will be able to get more value from the data using onboard software. Decision making will be improved enormously through analysis of historic data. Electronic logbooks can also be extended to monitor a great deal of environmental data that could be made available to the scientific community.

Using onboard software, data validation can be implemented at the point of first capture, for example the vessel grid position is determined by the system based on the vessel's GPS longitude and latitude. Sensors or software tools, coupled with the electronic logbook software, can report their values with an agreed frequency to the electronic logbook, resulting in further simplification of the administration work and improving the quality of the data even more.

Guiding Principles

Fishing companies have a wide array of options to capture their fishing data, from off the shelf software to developing their own system in-house. However some sort of standard or protocol will need to regulate how the data is transferred to or integrated with systems at DAFF.

Data may need to be moved from one platform to another or from one geographic location to another. This data must be moved to make it accessible to other applications that need it without impacting the performance of the source or receiving system. Efficiencies become even more critical when the data volume is large.

Transferring data to DAFF can be accomplished either by building connection mechanisms to the various systems or by transferring data between systems at periodic intervals. In considering the various options available to us, the following guiding principles were applied:

Affordability

It is essential that electronic logbooks applications be cost effective for all stakeholders involved. Meeting the requirements of the standard should not create undue pressure on stakeholders, and thereby increase their operational costs

Innovation

The standard should be developed to support innovation. Stakeholders should retain their innovative abilities when developing electronic logbooks applications. The standard should be developed to clearly identify the needs of DAFF and other stakeholders, without excessively limiting ways of meeting those needs.

Flexibility

The standard should be developed to be in keeping with the diverse context of the South African fisheries, and meet the technical, socioeconomic, and scientific needs of all South African fishing fleets. The standard should be developed to present options enabling adaptation of electronic logbook applications to the diverse realities of South African fisheries

Integrity

The standard should be developed to ensure that data integrity is maintained at all times throughout the data capture, storage, processing and transmission processes. The standard should be developed to ensure that E-LOG applications accurately record the data, and that the data transmitted from the fish harvester to DAFF is an accurate representation of what was entered by the fish harvester, even if a data conversion or a file conversion took place.

The standard should be developed to ensure that the client application will not prevent fish harvesters from submitting a declaration. Fish harvesters should be able to declare, for example, all species caught, without limiting the number of species that they can declare.

Security

The standard should be developed to ensure the security of information. As the information is sensitive, it is critical that all effort be made to ensure that no prejudice is incurred by any stakeholders due to data loss or inappropriate access to data

Data Transfer Format

The format of the data refers to the organization of digital information that is read and processed through computer software.

Choose a file format that is open, non-proprietary, used widely, and can be opened and shared without special software or hardware. Examples of standard formats are OpenDocument Format (ODF), ASCII, tab-delimited format, comma-separated values (csv), XML, TIFF, and JSON.

If the data will only be read by an application, consider using Text, ASCII, tab-delimited, and comma-separated values.

If data is transferred via a web service, JSON (JavaScript Object Notation) is a lightweight data-interchange format. It is easy for humans to read and write and easy for machines to parse and generate.

If a backup-process involves opening the received data and then manually capturing the data, consideration must be given to what tool the user will use to read the data. If data is passed on to DAFF via Excel spreadsheets, potential compatibility problems must be considered.

Data Transfer Options

This section describes the architectural options that are available for sharing data between discrete applications. The discussion here is independent of commercial solutions; rather it focuses in genres of technologies that are available in the market today

Option 1: Real-time Transfer

Real-time data transfer from the fishing company directly to the DAFF database for various reasons will not be considered at this stage. It would require a major review of current processes and most likely major amendments to existing regulation. As there is no need for data to be propagated to the DAFF data repository in real-time, the cost and complexity of development do not warrant any further exploration of this option.

Option 2: Propagation of data from the fishing industry to the existing Operational Database at DAFF

DAFF has indicated that no changes to the existing operational database will be considered, neither can data be posted directly to the database as it bypasses the system in place for checking the individual submissions of data to ensure their accuracy and completeness.

For security reasons no external system will be allowed to connect to the Operational System at DAFF.

Option 3: Propagation of data to a "Staging Database" at DAFF

In its simplest form, "staging" involves putting something in a specific location to be accessed at a later time. For databases, the most common staging location would be a database table in the existing database, or in a separate database. As data is kept for a short period of time (until it is transferred to the operational database or discarded), even a basic MS Access database containing a single table can be utilised.

A further consideration will be the location of the staging database.

1. Same server as the production database
2. A new server connected to the same network
3. On the same workstation where the existing Frontend is loaded. This could be the appropriate option if the staging database will be populated via a memory stick or e-mail attachment and the staging database is only accessed by a single user.
4. At an approved web hosting service provider. One option would be to use the hosting provider currently used for the Electronic IUU Catch Certification system.

Data can remain in the staging database for a preset period of time, or can be deleted as soon as the data is processed and send to the ODS (DAFF Operational Database).

The next step in the process is using the data in the staging database when the user at DAFF processes a logbook.

Step 1 – Transfer data to the Staging Database at DAFF

- a. The Fishing Company pushes data to the Staging Database. The 'push' can be frequently triggered by a scheduled requirement, for example, daily update, or manually by the user, for example at trip end.
- b. DAFF pulls data from the fishing company to the Staging Database. The 'pull' can be triggered from the DAFF Front-End feeding the ODS (DAFF Operational Database), or from a new front-end build for and managed by DAFF
- c. The staging database is updated by a DAFF user by importing data from an email attachment received from the fishing company. A relatively simple frontend can be developed by the industry and installed on the designated user's or users' workstation(s) at DAFF to manage this process.
- d. The staging database is updated by a DAFF user by pulling the data from an USB drive delivered to DAFF. A relatively simple frontend can be developed by the industry and installed on the designated user's or users' workstation(s) at DAFF to manage this process.

Step 2 – Data is transferred from the Staging Database to the DAFF Operational Database

- a. Data is saved to the ODS via a new front-end after a DAFF staff member verifies, and if required, amends the data.
- b. Using the existing frontend data is retrieved from the Staging Database and prefills the fields currently displayed on the existing front-end. This will require adding a menu option to the existing front-end and some code to connect to the Staging Database and populating the active form (window).

Figure 2 - Data transfer using Push method

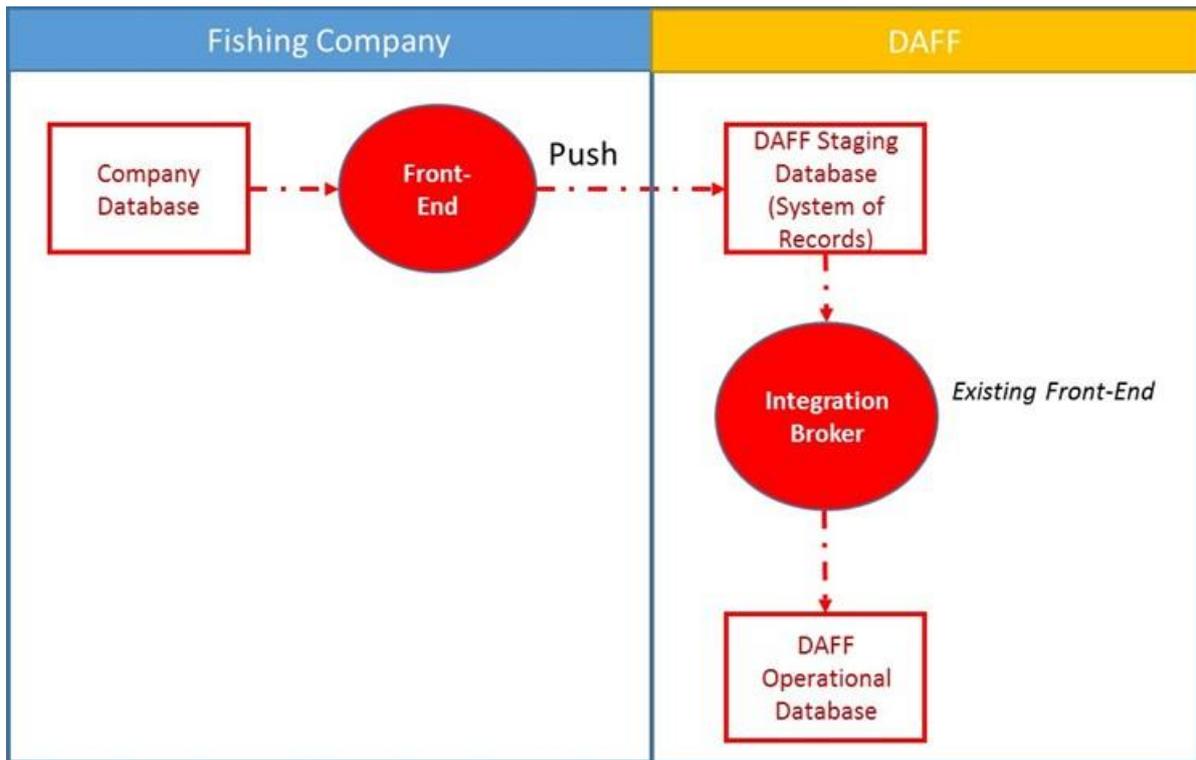


Figure 3 - Data transfer using Pull method

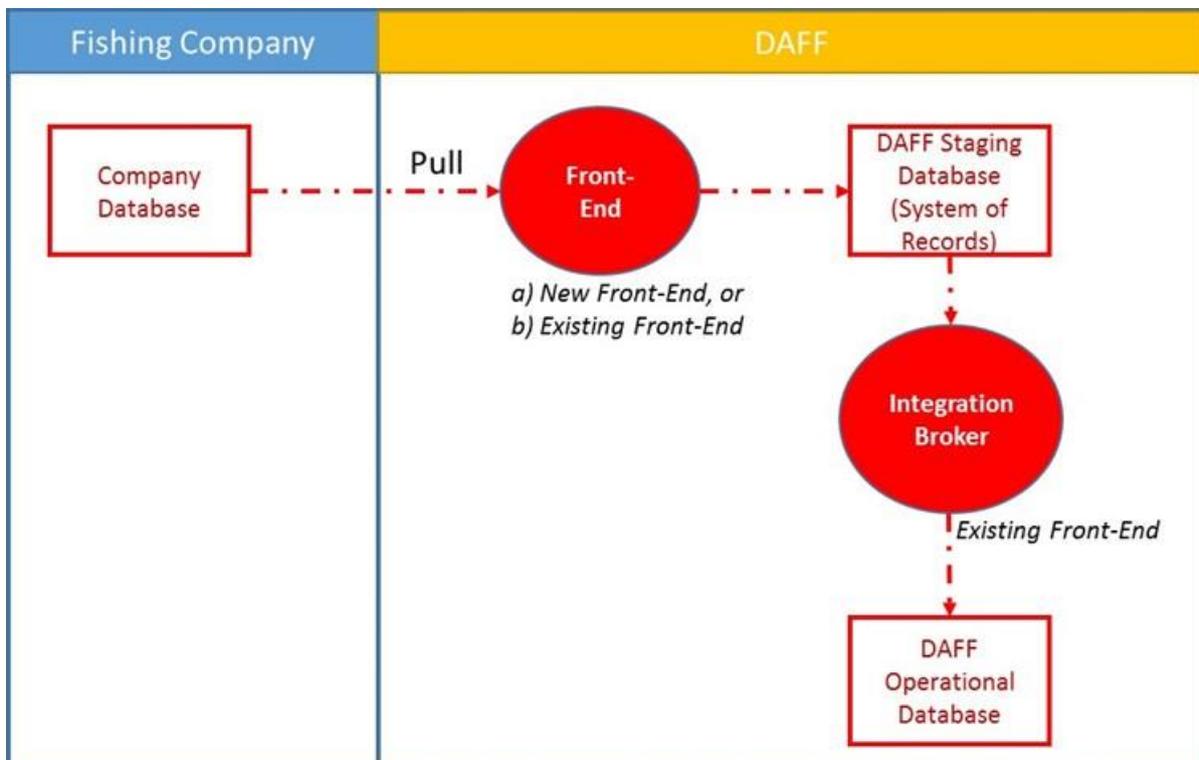
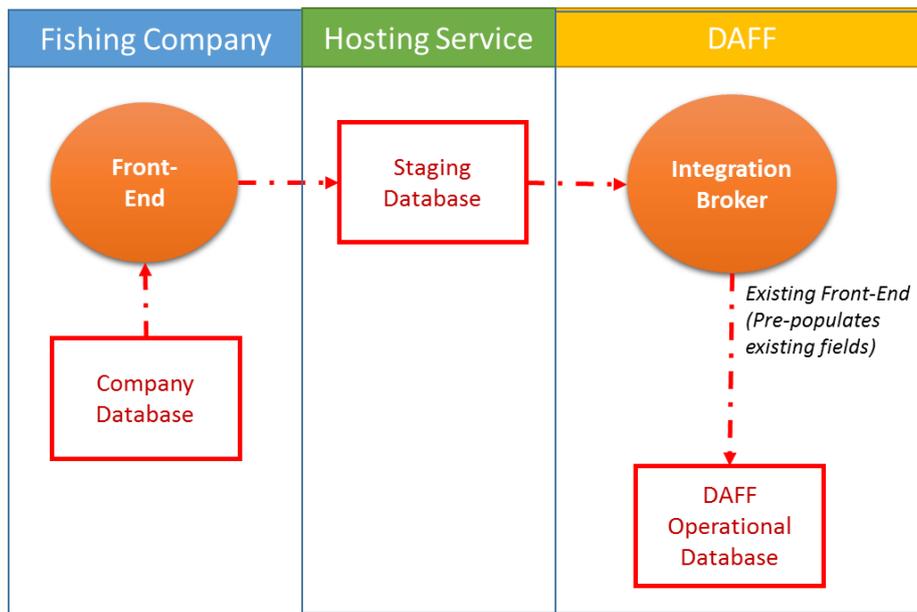


Figure 4 Data Transfer Using Hosting Service

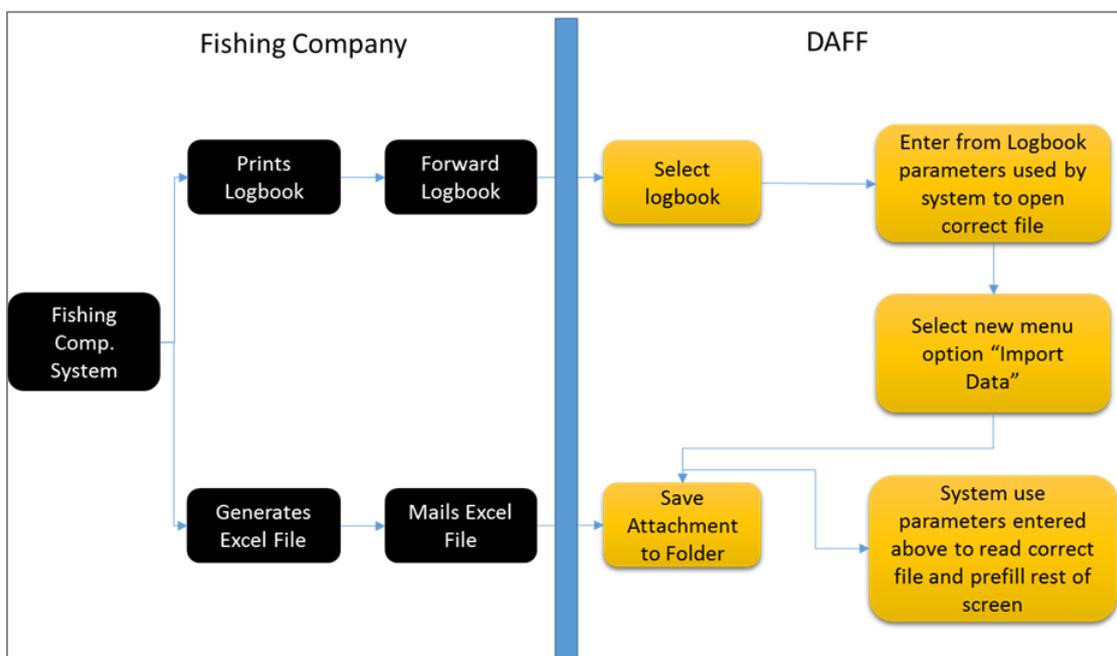


Option 4: Use an Excel spreadsheet as Data source

Data can be entered into an agreed Excel template, either by the fishing system in use by the fishing company, or in the case of stakeholders without a system in place, by capturing the data into the spreadsheet directly.

A spreadsheet per trip can either be mailed or delivered directly to DAFF with the printed or hand-completed logbook. At DAFF the spreadsheet file can then be saved to a shared folder with the required access permissions applied to the folder.

Figure 5 prefilling input fields from Excel Spreadsheet



The existing frontend will need to be enhanced to import the data from the relevant spreadsheet and prefill the input fields on the active screen. The system can either select the correct spreadsheet based upon some initial information entered by the user, alternatively the system could present the user with a **File Open Dialog box** enabling the user to select the required file himself.

The following factors will have to be considered:

- a. Different versions of Excel in use in the Industry
- b. Capabilities of the current DAFF frontend as far as Office Interoperability is concerned
- c. Retention policy for received spreadsheets
- d. An agreed file naming convention

The file name must contain sufficient elements in the structure of the name to ensure either the user or the application (depending on the process implemented) can correctly identify and retrieve the file, for example **Company Code_VesselCode_DateLanded (01_FOXGLOVE_20160921)**

Elements should be ordered from general to specific detail of importance as much as possible

The order of importance rule holds true when elements include date and time stamps. Dates should be ordered: YEAR, MONTH, DAY. (e.g. YYYYMMDD)

Once the file naming and storage policies are finalized, they should be documented and made available to all participants to follow. Everyone should be sensitized to the importance of diligently applying the agreed naming convention.

Option 5: Printed logbooks only

Irvin & Johnson has already added functionality for producing a printed logbook at trip end. This alone will make data capturing at DAFF easier and more accurate. As explained above, data validation within the Vessel Data Logger system as well as the integration with various vessel equipment (GPS, depth and temperature sensors etc.) improves the overall quality of data submitted.

The printed logbook is identical to the logbook currently in use and will include the landings summary as well.

When the onboard system cannot function due to hardware failure, the skipper will revert to the paper logbook for that trip.

Consensus on where and when the logbook will be printed, signatures on documents (by hand or digital) or any other possible concerns need to be reached. Any issues or concerns will be added to this document as and when raised.

Making the system available to other fishing companies

Irvin & Johnson is prepared to upgrade the system in order to make it available to other fishing companies. Each company's system will be independent from each other. Provision will be made for vessels not having access to Fleet Broadband