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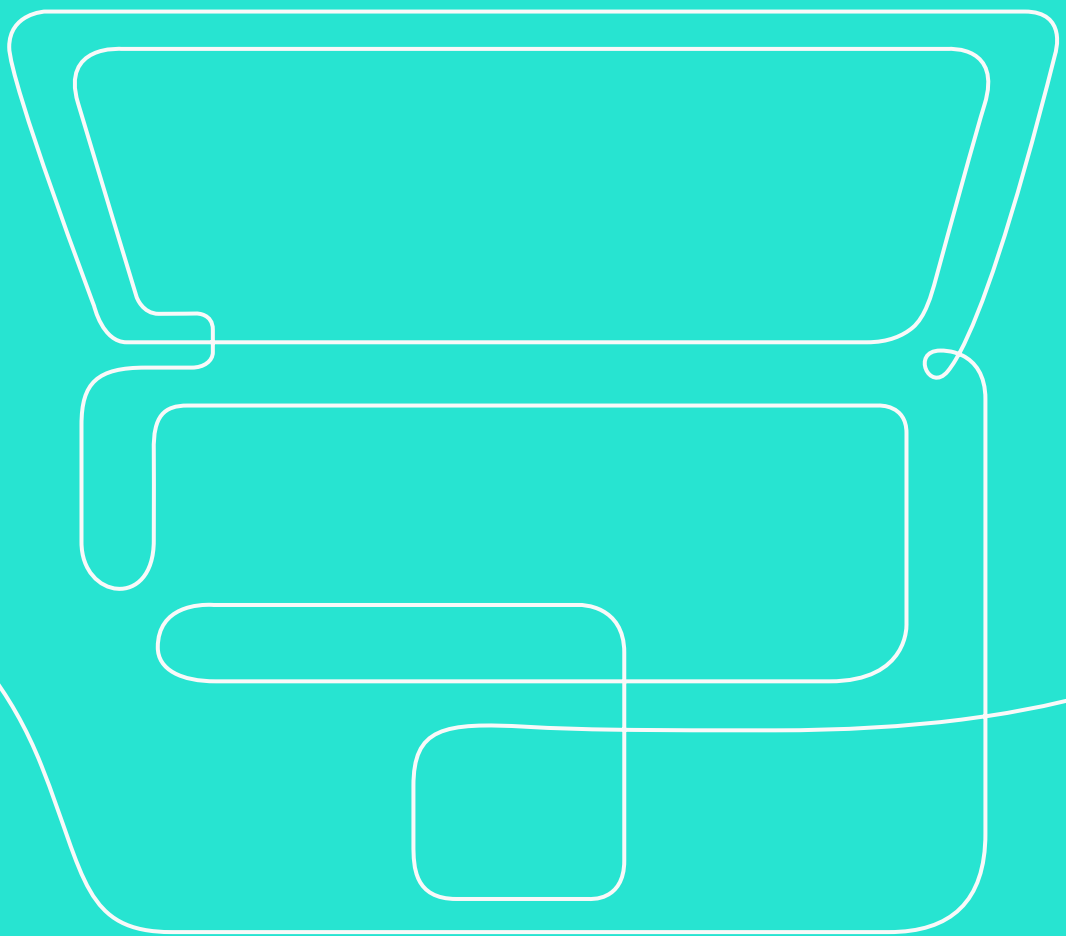

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A l'attention de

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Final report regarding the SIOFA data report and data assets visibility web application development

Contents

We are going in this report to take a closer look to all activities done during this 6 months project and we will make sure that all the items expected in the contract have been well executed and delivered.

1 Background

The EU has agreed to a 2.5-year funding arrangement1 "2020-2022 Support to SIOFA Scientific Work on key stocks, ecosystems, and data" to enable SIOFA to commission a series of scientific studies to support the SIOFA/Scientific Committee's (SC) Work Plan. The actions end on 30 April 2023. Therefore, the proposed project is integrated with SIOFA's ongoing and planned scientific actions. Particularly, the project (SEC2022-01) focuses on "Reinforcing the data collection, SIOFA data/base systems, and coding and data processes" as per General Objective 4 of the funding arrangement.

Time series of fishing effort, catch, biological samplings are already part of the SIOFA databases. However, the adequacy of these data can be evaluated only in the context of the purposes for which they are used and currently there are strong limitations both for the Secretariat and the final users.

General Objective 4 aims at "*making operational and reinforce the accessibility of the database to users, the coverage or completeness, and also credibility of the data collection process and the internal management process that uses the data including the time-consuming compilation and filing of raw data*".

SIOFA has several data assets that have been build following the directions of the MoP and considering the successful implementation of the CMMs. However, SIOFA Contracting Parties, Cooperating Non-Contracting Parties and Participating Fishing Entities (CCPs) have a poor visibility on their content and status.

The proposed project will build on the work already undertaken by previous SIOFA initiatives such as the "independent audit of data security: access, dissemination, and presentation of data" and the "independent audit of data security: physical security" hence the focus on accessibility and visibility of the database to users.

2 Objectives

The objective was for the CCPs and the general public to be informed and understand the data that is collected and available at the Secretariat. The data accessibility and visibility would be improved through the creation of a user-friendly system giving the possibility to provide data on to the SIOFA website, under a general "data" section to users.

Obviously, SIOFA has an existing site and the question arose as to whether or not the new features to be created should be integrated into this site. Thus, when issuing the financial and technical proposal, two solutions were considered and proposed:

- The first one was to keep the existing version of Drupal but which unfortunately is at the end of its life in terms of support and security updates,
- The second one was about to migrate the existing site on a new version of Drupal (9 or 10) and develop the new features expected on this new version and within the website itself (via new topics and sub-topics)

It is this last solution which was privileged and we thus have here a third item to the list below which will be the one realized in the first place.

a. Migrating and improving the existing website

The website previously under Drupal 7 has been fully migrated and modernized with some visual improvements including a compatibility on mobile devices.

b. Developping the summary data reports feature

This category will provide highly aggregated information considering CMM 2016/03 (Data Confidentiality) about targeted species, the main fisheries and biological information stored, and about the spatial and temporal availability of the data. Information provided will be in line with the public domain data as per CMM 2016/03. It is proposed that the aggregation level provide information on a yearly basis and on a SIOFA sub-area geographical scale.

Only highly aggregated data without any information of the number of vessels involved will be disclosed, it does not identify vessels or CCPs and therefore may not violate the requirements of SIOFA CMM 2016/03 on data confidentiality. However, in several instances, yearly species catch tonnages would be calculated from the catch of a single vessel. The system would provide that information to the public if the concerned CCP consent to this.

The coherence between the content of this highly aggregated information and the information contained in the SIOFA overview of fisheries and SIOFA ecosystem summaries is assured.

c. Developping the Data status reports feature

The other part of information provided would be the status of the recent data submissions and the quality (accuracy and completeness) of the historical data held in the SIOFA databases. The report would provide information on a yearly basis, by fishing flag and by gear.

3 Activities

The following is a summary of the main activities that took place between October 2022 and April 2023, i.e. approximately 7 months of work. This duration exceeds the envisaged schedule by two months, but the total effective workload nevertheless respects the conditions set out in the contract.

09/2022	• Obtaining SFTP access to the SIOFA site, the database and all the hosted files • Launching the migration work by developing a migration tool and by migrating all files, users, and any data that were available on the

	previous/existing website to the new website (full database and files migration)
10/2022	• Obtaining the first data set "SIOFA_catch_effort_data_sampe.xlsx". This file is an example of annual catch and effort data that will be used in the "fishing data" part of the application. • Implementation (part 1) of the new section via PHP development, MySQL structuring and advanced Drupal configuration (content type, views, etc.)
11/2022	• Obtaining a second dataset " DataQualityReport.xlsx " concerning the quality and status of the datasets and which will feed the "data status report" part of the database. • Implementation (part 2) of the new section via PHP development, MySQL structuring and advanced Drupal configuration (content type, views, etc.) • Realization of a Zoom conference • Delivery on 23/11/2022 of a first migrated version of the SIOFA site • First recipe of the site delivered, some corrective measures carried out including adjustment of the new navigation menu proposed on the site (now compatible desktop, tablet and mobile via a new graphic theme) and adjustment at the level of the permissions and user roles. • Obtaining the SMTP information necessary to send system messages
12/2022	• Official delivery on the production site of the migrated and tested site after written agreement by Pierre Peries • Adjustment of the configuration concerning redirections (siofa.org VS apsoi.org) and indexation under Google • Issuance of a report on the status of developments as of 21/12/2022 sent to SIOFA • Organization of a meeting on Zoom to clarify some blocking points to continue the developments • Opening of an OVH ticket concerning redirection issues
01/2023	• First delivery for acceptance on 06/01/2023 with imported data provided in "SIOFA_catch_effort_data_sample.xlsx", and "DataQualityReport.xlsx". • Update and return of SIOFA with updated data and general adjustments/corrections on new features delivered • Application of data visibility/confidentiality rules according to the current user's membership in a CCP • Graphic/visual adjustments, permissions, fields used in front or back office
02/2023	• Request to separate the data reports part (one for the catches and the other for the efforts). A meeting is organized on 09/02/2023 to stabilize this request. • Development of the expected fixes and acceptance with some adjustments during the month
03/2023	• Official delivery of the data section to the production site • New adjustments on the access authorizations to the sections

	• Update of the production site and end of developments
04/2023	• Writing of the technical documentation v1 in preparation for the training • Training and project handover by video-conference on 28/04/2023
05/2023	• **Final deployment update on production server** • Delivery of the technical documentation, the final report and the sources of the developed module.

4 Expected tasks and deliverables

The contract indicated the following main tasks. We will ensure in this report that all contractually agreed upon elements have been delivered, or their equivalent if during the production process arbitrations were to contradict the initially planned elements.

4.1 T1. Build a meta-data database (MDDB)

« According to the data that need to be made accessible (defined in annex 1). The database shall be based on current web standards (e.g. MySQL). »

MDDB is usually referred to a « multidimensional database ». A MDDB is designed to store and analyze data with multiple dimensions, providing a specialized approach for the analysis and exploration of complex multidimensional data.

In the case of this project, it is rather a relational database with obviously possibilities of adding meta-data but as it is a question here of using Drupal, it is necessary to conform to the rules in force namely the use of views, entities, types of contents, fields according to the objectives aimed at for the user interface as well front (consultation of information) as back (administration of these data)

Drupal 9 is based on the relational database MySQL 5.7.8 which is common to the SIOFA website that has been migrated and to the new features (and their data) developed during this project.

MySQL 5.7.8 is a recommended standard for application database design due to its robustness, performance, and extensive community support. It offers advanced features like JSON support, enhanced security, and improved query optimization. Its stability and compatibility make it a reliable choice for building scalable and efficient database-driven applications.

4.2 T2. Make a gap-analysis

« Analysis of the current SIOFA databases against the requirements defined in task 1. And Provide recommendations for update of the SIOFA databases to enable the availability of all information required. »

Throughout the project, adjustments were made to ensure that the previous site was migrated from Drupal 7 to Drupal 9, which included a migration of the database and files, but also the structuring to accommodate the new features developed in this project.

Let's recall here the significant changes between Drupal versions 7 and 9 :

- *Database fields*: In Drupal 7, custom fields were stored in separate tables for each entity, which could lead to redundancy. In contrast, Drupal 9 uses the Field API module which stores all custom fields in a single table, called "field_data_field_name". This allows for a more consistent database structure and makes queries and data manipulation easier.
- *Revision Management:* In Drupal 7, revision management was handled by add-ons such as "Revisioning" or "Workbench Moderation". However, in Drupal 9, revision management is integrated into the core system. Revisions are stored in a specific table and revision tracking and publishing features are included by default.
- *Entities*: Drupal 9 has introduced a more uniform approach to entity management. Basic entities, such as nodes and users, are now stored in a single main table called "entity". This table contains fields common to all entities, while entity-specific fields are stored in separate tables.
- *Data structuring*: Drupal 9 puts more emphasis on data normalization. Database tables are designed in a more modular and standardized way to allow for better scalability and more efficient data management. This also facilitates data migrations between different Drupal installations.

These changes in the Drupal 9 database structure are aimed at improving the performance, flexibility and maintainability of the system. They also allow for better integration with Drupal modules and features.

For more technical information, please refer to the technical documentation provided or visit https://www.drupal.org/documentation.

4.3 T3. Set up automated routine(es) for the MDDB to be automatically updated.

« The routines would take information from the SIOFA databases (datasets, catch and effort, observers' data, etc.), process the information as required and upload it into the MDDB. The routine shall be easily updatable to consider new needs that may arise after this project is ended. »

In accordance with the expectations expressed here, we have developed a module allowing the automation of the data import process via the import in several steps starting from a file exported from your own tools. This file to be imported must be in XSLX format. All imports will be recorded.

The process is launched from the Drupal administrator interface (which requires to be authenticated as an administrator). The administrator then goes to the "Manage" section and selects one of the three possible options:

1. Fisheries catch data reports
2. Fisheries effort data reports
3. Data quality report

Once the parameters have been configured and the XLSX file has been selected, the next page lists the columns present and will allow you to select for each one a label (by default, identical to the name of the column), a type of field, and whether this field should be visible or not on the front. Regarding the types of fields, they are based on the files provided as an example. It is possible to add more if necessary. All the parameters defined here will be saved for the next import, i.e. the columns that persist between 2 imports keep their configuration.

The administrator will then have to confirm the validity of the parameters before the import can begin. This process is as follows:

1. Deletion of the view linked to this data. The page no longer appears in the main menu.
2. Deletion of the previously imported contents (1 content per line in the Excel file)
3. Deletion of the associated content type.
4. Creation of the type of content, taking into account the fields previously set up
5. Import the data from the Excel file
6. Creation of the view according to the defined parameters.
7. Add the link to this view in the main menu.

In case of an error at any stage of the process, due to an incorrectly formatted line, for example, it will suffice to correct the source data, then restart the process. No import error should be blocking or impact the rest of the site

4.4 T4. Design the website interfaces for visitor to request the information.

« The interface would preferably be integrated in the current SIOFA website (which is running with Drupal), or a subdomain will be created and dedicated to this service (e.g. data.apsoi.org).

The interface will have an option to login as a Drupal member (members, roles and permissions are currently set on the SIOFA website). Logged-in users from SIOFA will have access to information classified as restricted once defined. »

For the realization of the new graphic theme which had nevertheless to respect the old theme used for the SIOFA website (it was not envisaged to redesign it), we focused our work on a migration towards the last version of Bartik: 9.5.9.

Bartik 9.5.9 is a responsive and accessible Drupal theme that provides a solid foundation for building websites that work well across PCs, tablets, and mobiles. Its customizability allows you to align it with your brand identity, but for more unique or complex designs, alternative themes or customization may be required.

- *Responsive Design*: Bartik is built with responsive design principles, ensuring that your website looks and functions well on various devices, including PCs, tablets, and mobiles. It adapts its layout and elements to different screen sizes, providing a consistent user experience.
- *Accessibility*: Bartik follows accessibility standards, making your website more inclusive and usable for individuals with disabilities. It provides accessible navigation, color contrast, and semantic markup, enhancing usability for all users.
- *Customizability*: Bartik offers a range of customization options, allowing you to modify colors, fonts, and layouts to match your branding and design preferences. It provides a user-friendly interface for managing theme settings.

4.5 T5. Construct the outputs pages for the result to be displayed.

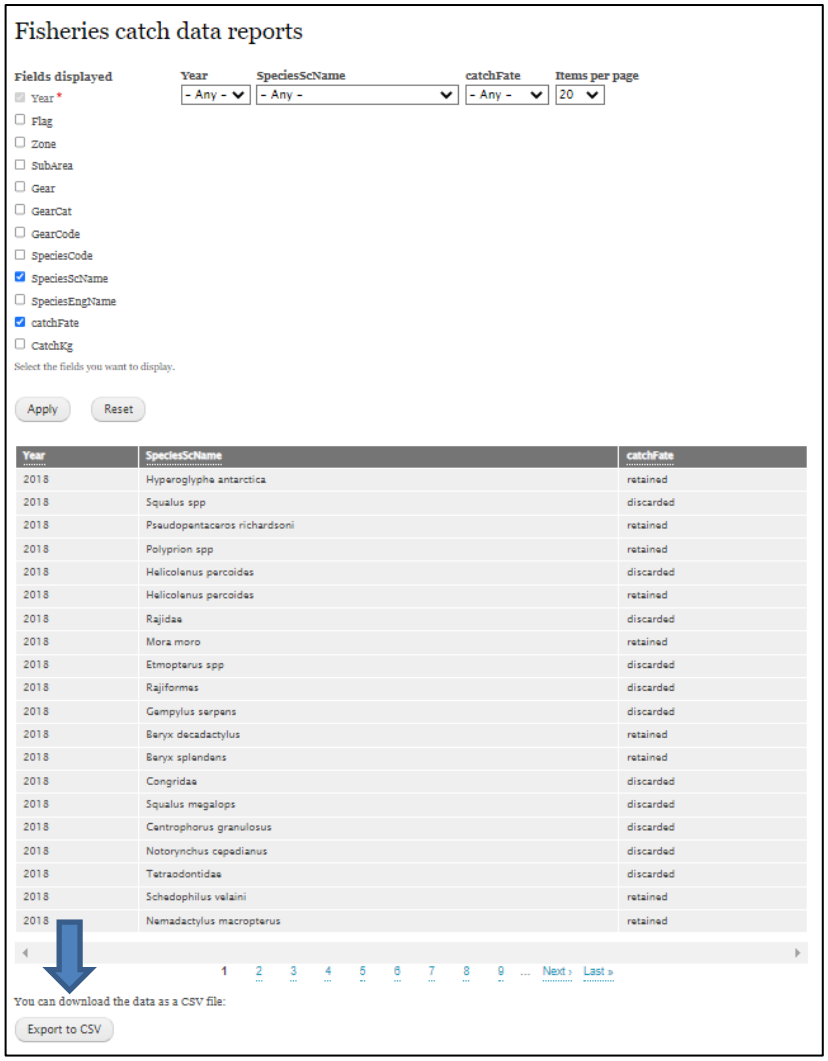
« An option would be available to download the information (in a Excel or CSV format) for future use by the user. »

During this project, several solutions were discussed and adjustments were made, especially at the end of the project, concerning the user interface for consulting the data, their pagination, their filtering and also the way to export the results. It is also possible to easily reorder the data displayed by ancestry or descent on the main columns.

If the user wants to export all the information (i.e. displayed but also paginated), he just has to click on the "Export to CSV" button.

The CSV (Comma-Separated Values) file is a plain text file format that stores tabular data. Each line represents a row, and the values within each row are separated by commas. It is commonly used for data storage and exchange between different applications or systems.

Here is the visual solution that was chosen and implemented :



4.6 T6. Make available the online system

« The system would be first provided in test mode or on a specific address for review by the Secretariat, the SC and MoP heads of delegations (end-users panel) who would need to provide final signoff on the system. »

In accordance with this request and the habits operated by our company, the totality of the developments are initially carried out on our local servers, then placed at the disposal of a staging available at the address: https://siofa.naes-consulting.com/.

It is initially on this server that are carried out each receipt then once the agreement of SIOFA obtained, this one was then deployed directly on the production server.

4.7 T7. Revision and finalisation by the end-user panel.

« The core deliverable of the SIOFA Data Report and Data Assets Visibility is a user-friendly system that can be accessible by all SIOFA users allowing them to easily obtain the needed information. »

In the case of this project, and for all the projects carried out by our company, we strive to scrupulously respect the established standards, to recommend open-source solutions that are the most perennial and the least costly in their maintenance or their evolutions. The interface used here is strictly identical to the one that existed in the previous site. Only a few adjustments have been made for the screens related to the new features implemented, and the new graphic theme now allows the consultation of all the information of the website on media as varied as laptops, desktops, smartphones and tablets of all sizes and resolutions.

5 Conclusion

The project went perfectly well, even though it exceeded the established schedule and all the information transmitted and the various exchanges carried out by email or by videoconference, allowed us to deliver the integration of the requested functions and to respect the established budget.

The site is now fully functional and training in the use of the Drupal 9 back-office has been completed.

A technical documentation was delivered with this report as well as the source files of the module developed for the new sections of the data report and data assets visibility web application development.

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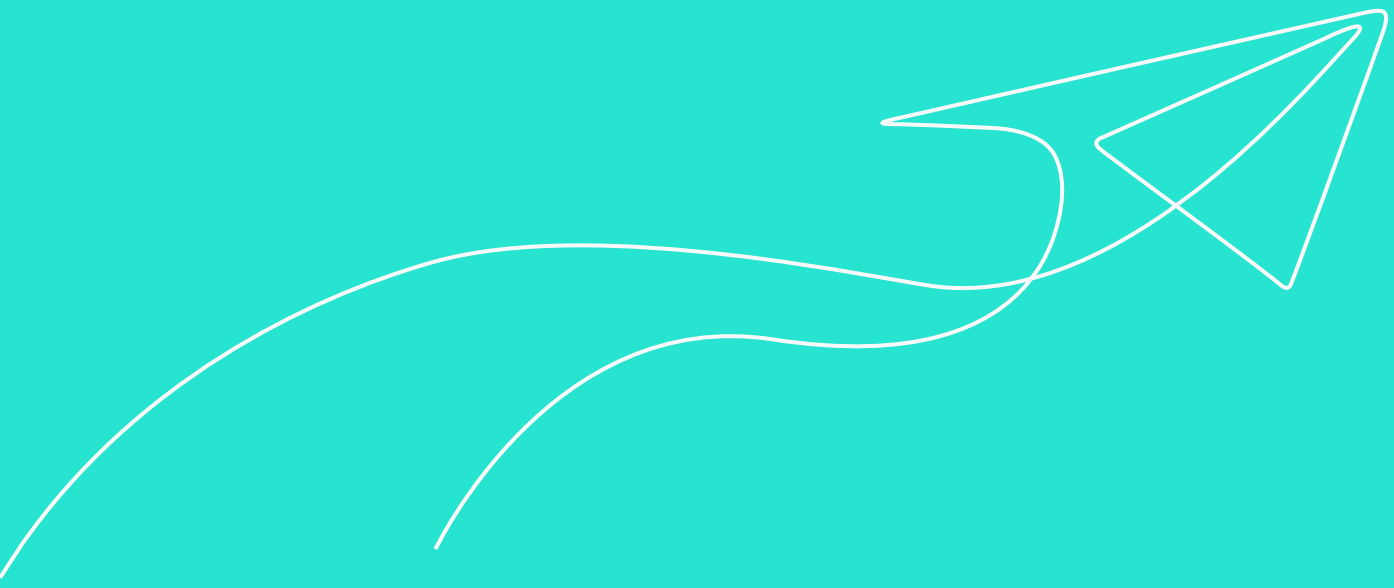

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