UN/CEFACT

SIMPLE, TRANSPARENT AND EFFECTIVE PROCESSES

FOR GLOBAL BUSINESS

BUSINESS REQUIREMENTS SPECIFICATION

(BRS)

FLUX General Principles (GP) domain

Business domain: Fisheries

Business process: Electronic data exchange for fisheries control and management

Document identification: P1000 – 1; General Principles

Title: Fisheries Language for Universal eXchange

UN/CEFACT International Trade and Business Processes Group:

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11/10/2013	1.0.0	Data model Structure	Draft version after harmonization process on October 2013	EHO
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Business Requirements Specification

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1 Preamble

Fisheries control and management is largely based upon the collection, storage, exchange… of large sets of data between the parties involved. Data sets are very diverse, ranging from tiny reports on the whereabouts of individual fishing vessels to aggregated reports of monthly (yearly) catches of the complete fleet of a country.

This data is collected for different purposes. Sometimes it is used to closely monitor the behaviour of a single vessel and in other cases it serves scientific purposes in preparation of scientific advice for establishing TAC for a future fishing season.

The requirements for data availability have historically grown and changed. The consequence is that for each business need individual data sets have been defined, and specific technical solutions have been developed.

Today, a large patchwork of (partial) data management solutions is in place. This diversity hinders data exchange, and often delivers questionable quality at high operating cost.

As part of the solution for this problem, the FLUX (Fisheries Language for Universal eXchange) project aims at defining a universal and efficient data exchange "language" compatible with (but not limited by) regulations and international requirements.

FLUX contains two distinct but related parts:

- The FLUX business layer

- The FLUX transportation layer

The FLUX transportation layer provides description for:

- The FLUX Envelope, one single yet universal message format that can encapsulate any business-specific message or structured data in a predictable way whatever the business system and associated data types and formats, using industry standard data representation techniques

- The FLUX Protocol, a mechanism describing how to reliably deliver the FLUX Envelopes to their destination and without human intervention, leveraging state-of-the-art existing technologies (SOAP Web Services) in a sensible manner so as to as much as possible avoid interoperability issues between FLUX implementations based on different vendors' solutions.

The FLUX transportation layer, or the IT architecture based on web services, is considered as beyond the scope of this document. The information above serves only for setting the context under which the business layer (which is the real subject of this document) will be implemented. It could also be valuable to know that typical data exchange difficulties like non-functioning endpoints are solved on transportation layer level and no measures are needed in the business layer.

The core of the FLUX business layer is

- the detailed and standardised description of each and any data element needed

- the standardised grouping of those data elements in messages required by the business for exchanging data between parties

For the FLUX business layer, standardisation of the data elements and formats is based upon the UN/CEFACT[1] approach. This allows for the description of the typical business processes.

Technically speaking, UN/CEFACT standardization provides a standardized schema for business process (XSD) and a standardized content (Core Components).

- The practical outcome of a UN/CEFACT standardisation project is a technical file called XSD (XML Schema Definition) for the business processes and requirements subject to the project. This XSD can be used for all data exchanges and processes described by the project.

- The data exchanged are also harmonized and published in standardized library (UN/CEFACT Core Component Library).

An extra advantage is that UN/CEFACT ensures compatibility with similar standardisation exercises taking place in other business area's which may influence the data requested from the fisheries sector like customs, food traceability and trade.

The long term ambition is to standardize all data exchanges related to fisheries management and control but the first priority is to standardize data exchanges related to the electronic logbooks of fishing vessels. This encompasses data exchanges between fishing vessels and their flag states, and between these flag states and other parties like e.g. coastal states..

The UN/CEFACT Modeling Methodology (UMM) approach and Unified Modeling Language is used throughout the document.

The structure of this document is based on the structure of the UN/CEFACT Business Requirements Specification (BRS) document reference CEFACT/ICG/005.

2   References

UN/CEFACT Modelling Methodology User Guide (CEFACT/TMG/N093)

UN/CEFACT Business Requirement Specification Document Template (CEFACT/ICG/005)

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[1] http://www1.unece.org/cefact/platform/display/CNP/Electronic+Interchange+of+fisheries+catch+data

3 Objective

The objective is to gradually create a single standard for all data exchanges related to fisheries management and control. At a later stage, this may include the exchange of scientific data that is e.g. used for determining total allowable catches.

One priority domain is the data exchanges related to fishing activities. Traditionally, fishing vessels have to record and report their activities in logbooks which are used for fisheries management and control purposes. Originally, these logbooks were kept on paper on board the vessel. The regulated content of the logbooks differs from country to country (or RFMO to RFMO).

These paper logbooks are gradually being replaced by electronic systems. Several different systems are already in existence:

- In the NEAFC and NAFO areas, vessels report in NAF format.

- Norwegian vessels use NOR-ERS (also called CREWS) when they fish in Norwegian waters, but also in EU waters.

- EU vessels use EU-ERS in EU waters, but have to use NOR-ERS in Norwegian waters.

There are several issues associated with the current arrangement:

- The multiplication of formats and systems creates important extra costs for vessels and other parties;

- Control and management is hindered by the differences in the systems

- NAF, EU-ERS and NOR-ERS have technical shortcomings and need to be modified or replaced.

- In general the fisheries data management is insufficiently standardised, both for messages and for codes used.

Next to the electronic logbooks, other electronic reporting systems exist for other data types. Some examples are:

- The exchange of license data between the EU and Norway

- The exchange of VMS data (mainly GPS positions of fishing vessels)

- Aggregated (weekly, monthly, quarterly …) catch reporting

- Observer reporting

- Seafood dealer / processor reporting

First, there are the data streams that record various aspects of fishing trips. These systems include: logbooks, dealer reporting, observer reporting, and VMS.

License data augments trip data.

Aggregated catch reporting is data derived from trip data.

The objective of this project is to describe a standardized electronic reporting language for data exchanges related to fisheries management. It aims at integrating and replacing the existing electronic reporting systems by creating a single approach addressing all requirements.

4 Scope

This document concentrates on the general principles that will apply to all messages sent with this electronic reporting system. Therefore it does not enter in the details of any specific business process or data model.

The principles for data exchanges set out in this document will first be used for harmonizing and standardizing the business processes and data exchanges for electronic logbooks of fishing vessels. The benefits include a common approach towards electronic logbooks for fishing vessels, interoperability between IT systems and easy exchange of data between parties.

This could be followed by similar initiatives related to data management for fisheries control and management, such as Fisheries inspection reports, Fleet data and /or Licenses and authorisations data.

The practical transportation of data between parties is excluded from this document but is subject of another part of the FLUX project (Transportation layer) .

Categories	Description and Values
Business Process	General Message Exchange
Product Classification	
Industry Classification	Fisheries sector
Geopolitical	Global
Official Constraints	European Regulations National Regulations Local Applicable Regulations International Agreements

Business Process Role	
Supporting Role	None
System Capabilities	Agreed level of security to protect data integrity

5 Stakeholders

The main stakeholders are (further parties involved can be defined in the individual business domains):

Fishing Vessel	'Fishing Vessel' means any vessel equipped for commercial exploitation of living aquatic resources;
Other Vessels	Any other vessel involved in fisheries activities like carrier vessels, tugs, inspection vessels …
Flag state	'Flag State' means the State in which the vessel is registered.
Coastal state	'Coastal State' means the State in the waters under the sovereignty or jurisdiction or in the ports of which an activity takes place;
RFMO	an intergovernmental fisheries organization or arrangement, as appropriate, that has the competence to establish conservation and management measures
RFMO secretariat	Regional Fisheries management Organization secretariat.
First Buyer	The buyer of fisheries products from a fishing vessel at first sale who is registered with the competent authorities of the State where the first sale takes place.

6 Business requirements

6.1 General model

6.1.1 Principles

This standard primarily concerns data exchanges between parties like flag states, coastal states, RFMO secretariats, and other.

Fishing vessels only communicate with the flag state and may use local systems for this purpose. However, any such local system should be able to deliver all data required by this standard for communication with the other parties.

6.2 Logical domain structure

In the longer term, FLUX formats will be defined for each domain of fisheries data (e.g. satellite tracking, licenses, inspections…). These formats will follow the general principles set out in this Business Requirements Specification.

Not every party is involved in all aspects of the fisheries business. As one example, a country not involved in Bluefin Tuna fishing has no interest in implementing the data elements, messages and processes for that particular fishery.

For this reason, the FLUX business layer is based on individual stand-alone business modules that allow parties to implement only the modules they need. The UN/CEFACT standardization approach guarantees that modules are compatible.

Once a party has completed a FLUX data exchange installation for a single module, it should be fairly easy to plug in extra modules for other data exchanges.

Each business domain is an understanding and explanation of information and behaviors in the specified problem domain.
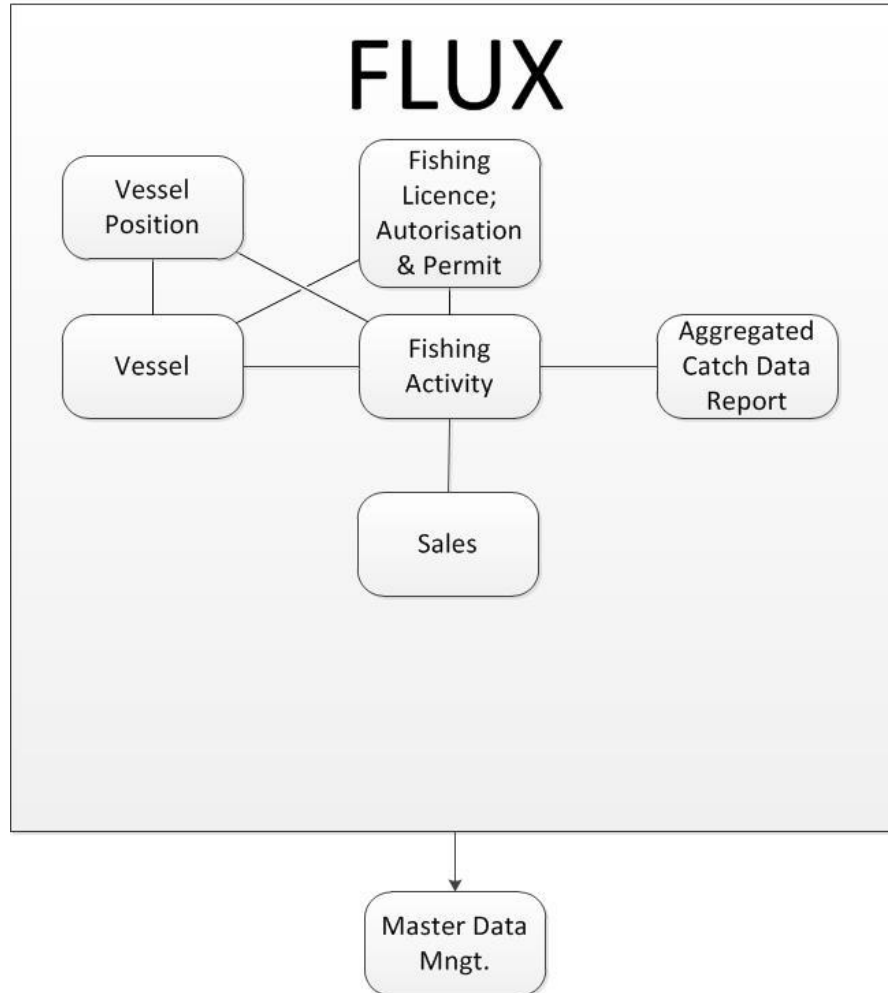
Figure 1 FLUX sub-domain definition diagram

As described in Figure 1, FLUX domain includes several sub-domains which interact to each other by using elements defined in other sub-domains.

The following sub-domains have already been identified:

Vessel: The vessel domain contains all information related to the identification and the description of the vessel itself.

Fishing Licence; Authorisation & Permit: Includes national as well as international licences, authorisations and permits.

Vessel Position: Contains all data exchanges related to the position of the vessel.

Fishing Activity: Contains all data related to a fishing trip. This domain includes all data concerning landings of fish. A transshipment is considered as a special "landing" involving a second vessel and is also included in this domain.

Sales: The sales domain includes all transmission of data concerning first sales of fish since a landing operation.

Transport: The transport domain includes all data concerning transportation of fish between landing and first sale

Aggregated Catch Data Report: This domain describes the catch data, which was originally gathered from vessels by Flag States, which is aggregated and exchanged with International parties.

The general approach for each one of these domains is very similar (and as far as possible identical). The biggest difference between domains is the actual business content.

The various domains will be detailed in separate documents such as:

P1000 – 1; General Principles (this document)

P1000 – 2; Vessel domain

P1000 – 3; Fishing Activity domain

P1000 – 4; N.A

P1000 – 5; Sales domain

P1000 – 6; N.A

P1000 – 7; Vessel Position domain

P1000 – 8; NA

P1000 – 9; Fishing License; Authorization & Permit domain

P1000 – 10; Master Data Management domain

P1000 – 11; NA

P1000 – 12; Aggregated Catch Data Report domain
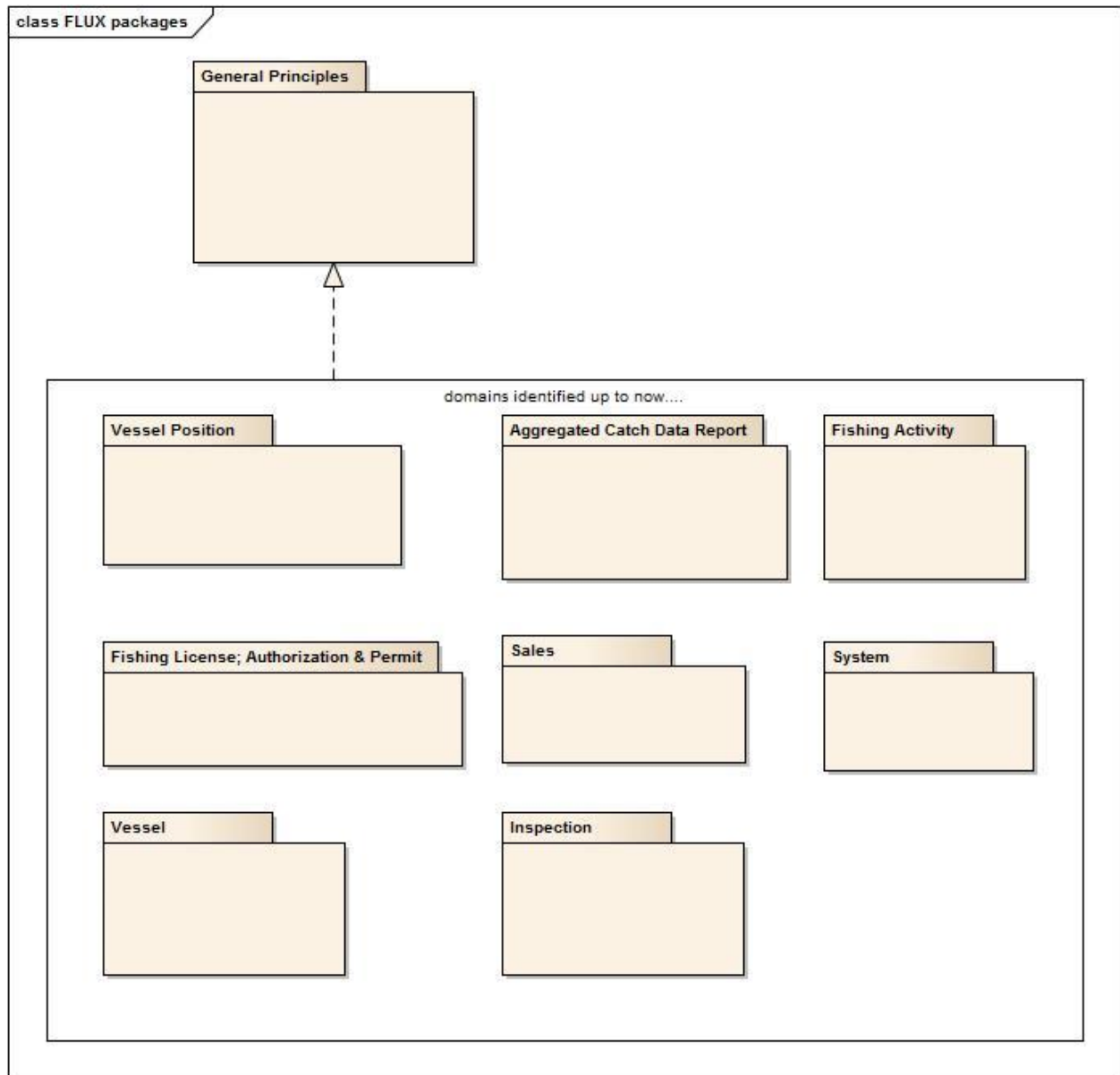
Note: This list is not exhaustive.

Figure 2 FLUX domain package diagram

As described in Figure 2, each domain extends the data definition and the behaviour of the general principles specified in this document.

6.3 Information flow definition (activity diagram, description)

6.3.1   The general FLUX business message exchange
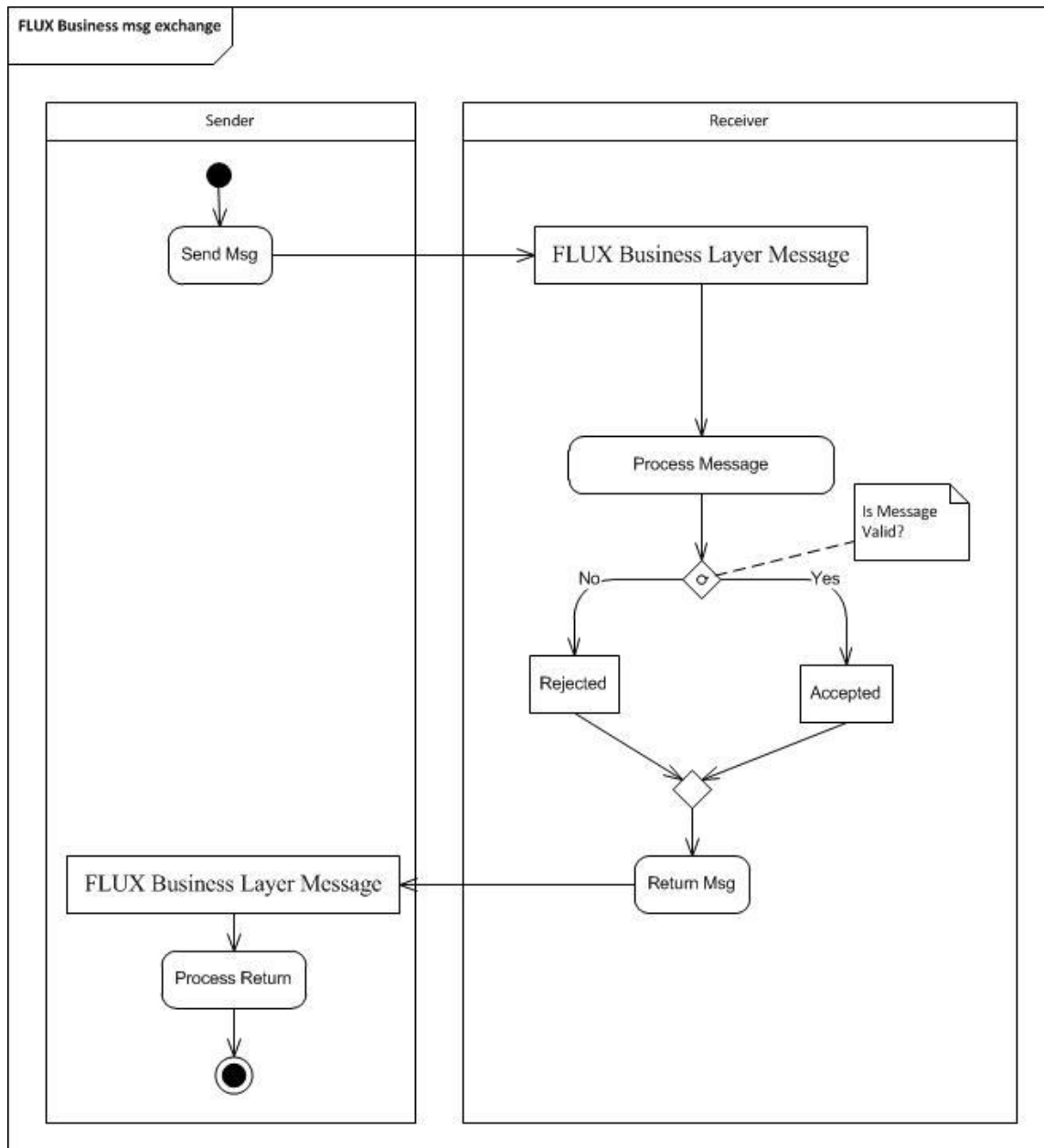
Message Exchange Activity Diagram[2]

Figure 3 FLUX message activity diagram

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[2]The activity diagram allows identifying all the significant information flows between the different actors exchanging FLUX information.

Activity diagram description:

1. The sender composes a message.

2. This message is sent to the recipient.[3]

3. The system of the recipient analyses the received message and validates the XML schema.

4. Depending on the actual business content of the received message, the process can vary from a simple storage of the received data to elaborated monitoring, validation or cross-checking. These processes are specific for each business domain and their description is beyond the scope of this document.

5. In all cases, the recipient formulates a single return message and sends it (again using the transport layer) back to the sender. This return message can be a simple business acknowledgement of receipt, a warning that the business content of the message is not accepted by the recipient, or a complex set of data. In all cases the *Response* message contains the unique id of the original message.

In all cases, the sender of a message is receiving one business reply from the recipient. One possible exception is that acknowledgements without any further business content could be avoided for very particular message types after common agreement for that particular message and business domain.

The single return message (Response entity) can be either a rejection (in case of errors) or an acceptance containing the business response.

Two different mechanisms are foreseen:

The REPORT mechanism:

- The sender (data owner) takes the initiative of sending new data in a message to a recipient. In this use case, the recipient sends a *Response* message back indicating either an Acceptance or a Rejection.

    o An *Acceptance* message confirms that the recipients business confirms that the original message is well received, valid and well processed.

    o A *Rejection* message states that the recipients business does not accept the content provided by the sender. (e.g. if the format of the content was invalid according to the XSD)

The REQUEST mechanism:

- The sender takes the initiative to request data from the recipient (data owner). The message is structured as a question containing the parameters needed by the recipients business for correctly replying to the original message. A reply message will be one of the following:

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[3] FLUX transportation layer is responsible for the transmission and the delivery of the message. The description of this mechanism is outside the scope of this document.

- A *Rejection* states that the recipient cannot or refuses to reply to the question of the sender. The reason for rejection could be explained in more details depending on process analyzing the transmitted data.

- Depending on the Query, a *Response* message can contain extra business data defined domain by domain.

6.4   Information model definition (class diagram[4])

6.4.1   Report_Document Declaration:

Description:

The *Report_Document* (FLUX Business Layer Message) entity is the common entity for any message to be exchanged between a sender and a recipient. On its own, it only contains general mandatory information.

Business by business and message by message, this entity will contain other elements that would store the concrete information to be exchanged.
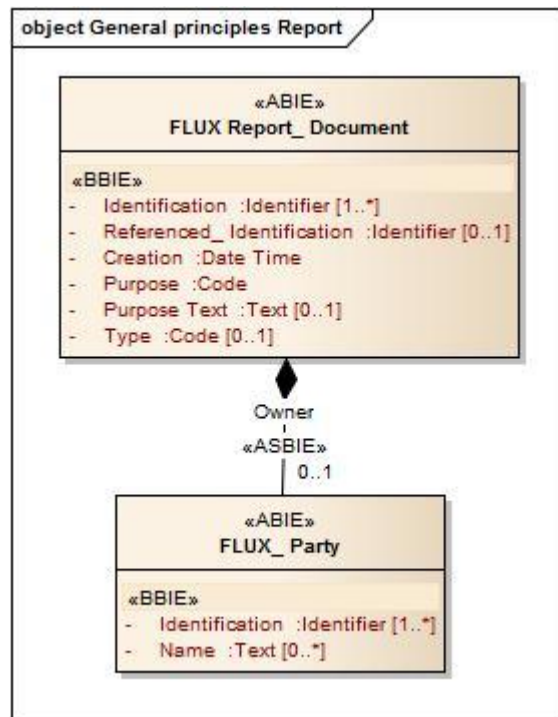

Figure 4: class diagram General Principles Report_ Document.

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[4] Class diagram describes all the necessary classes of information for a flow of general information exchange

FLUX Report Document Entity

Description: This entity contains a document that provides information for a Fisheries Language for Universal eXchange (FLUX) report.

Mult.	Business term	Rel.	Type	Description
1..n	Identification	Att	Identifier	An identification, such as RFC422 Global Unique Identifier (GUID) or a human readable identifier, of this FLUX report document.
0..1	Referenced_ Identification	Att	Identifier	The identifier of a referenced FLUX report document.
1	Creation	Att	Date Time	The date, time, date time or other date time value of the creation of this FLUX report document.
1	Purpose	Att	Code	The code specifying the purpose of this FLUX report document, such as original, cancellation or replace.
0..1	Purpose Text	Att	Text	The purpose, expressed as text, of this FLUX report document.
0..1	Type	Att	Code	The code specifying the type of this FLUX report document.
0..1	Owner	Ass	FLUX_ Party	The party that owns this FLUX report document.

The Identification attribute:

This attribute must contain at least a Global Unique Identifier (GUID): This is a unique reference number following the RFC 4122 standard. It is systematically used as an identifier for every individual message to be sent.

GUIDs are usually stored as 128-bit values, and are commonly displayed as 32 hexadecimal digits with groups separated by hyphens, such as 21EC2020-3AEA-1069-A2DD-08002B30309D. There are maximally 2^{128} different GUIDs that can be generated according to several different algorithms. This number is so large that the probability of the same number being generated randomly twice is negligible.

Each message has its own GUID, generated by the sender. The GUID is to be used as unique identifier by computer systems.

Other FLUX business domain can define a more human readable identifier in addition to the GUID.

The Purpose attribute:

Sending a message has a purpose. The purposes that have been identified for this general level have been based upon the standard functions for database management:

- Create (Original report)

- Update (Replace report)

- Delete (Cancelation report)

While the meaning of these terms seems to be fairly obvious, the practical workflow generated on the receiving end may be defined on a business by business, and case by case basis. Equally, specific actions may be identified on the business domain levels which are not described here.

It will in each case be necessary for each message to define the permitted actions for all specific message type.

FLUX_ Party Entity

Description: An individual, a group, or a body having a role in a Fisheries Language for Universal eXchange (FLUX) business function. Party has a legal connotation in a business transaction.

Mult.	Business term	Rel.	Type	Description
1..n	Identification	Att	Identifier	An identifier of this FLUX party.
0..n	Name	Att	Text	A name, expressed as text, of this party.

6.4.2 FLUX Response Declaration:

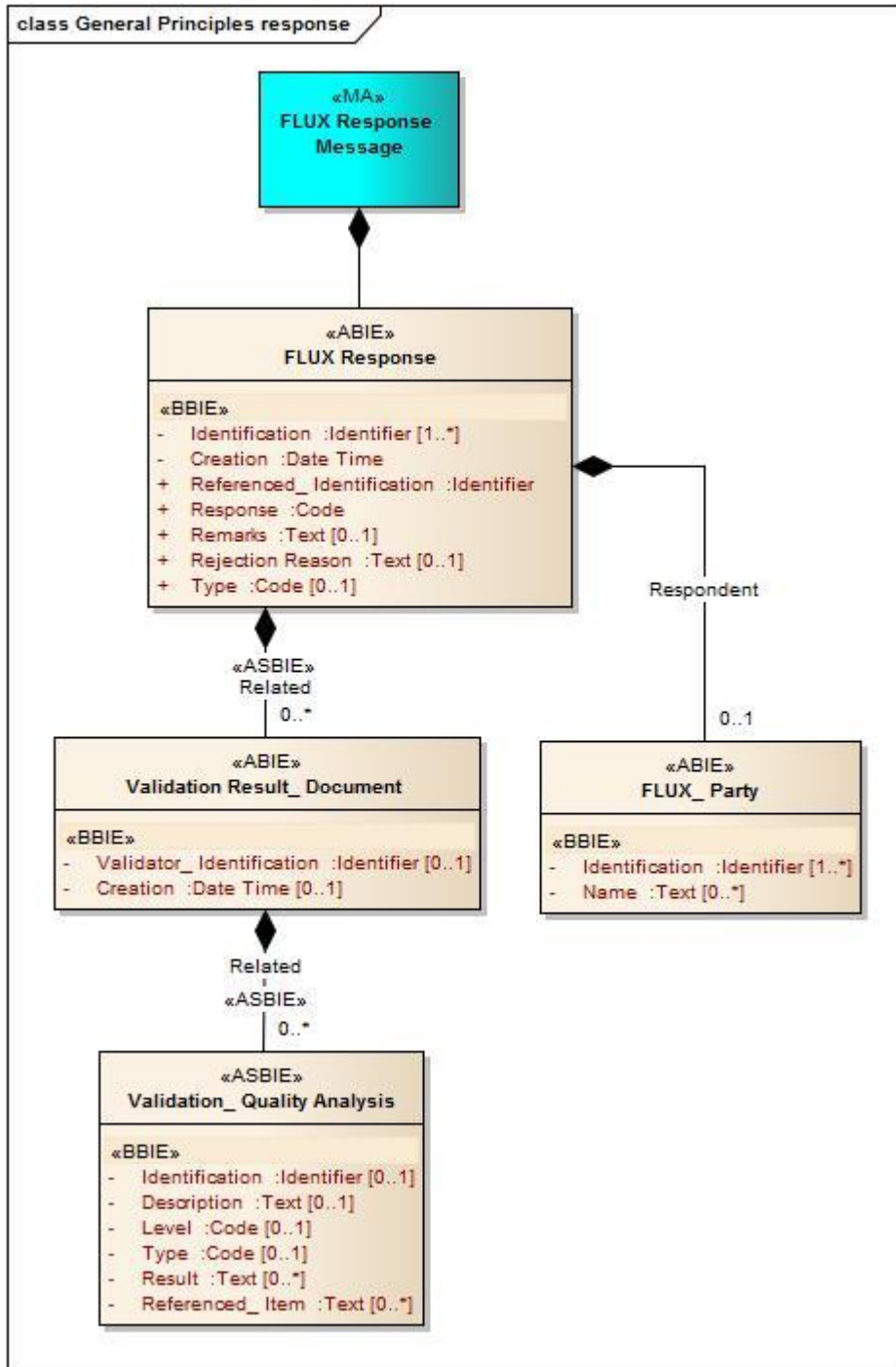Description: The response to a received message.

Figure 5: FLUX Response declaration class diagram

FLUX Response_ Document Entity

Description: Entity uses to provide the response to a received Fisheries Language for Universal eXchange FLUX document.

Mult.	Business term	Rel.	Type	Description
1..n	Identification	Att	Identifier	An identification, such as RFC422 Global Unique Identifier (GUID) or a human readable identifier, of this FLUX response document.
1	Referenced_ Identification	Att	Identifier	The identifier of the referenced document to which this FLUX document responds.
1	Creation	Att	Date Time	The date, time, date time or other date time value of a creation of this FLUX response document.
1	Response	Att.	Code	The code indicating the response in this FLUX response document.
0..1	Remarks	Att.	Text	Remarks, expressed as text, in this FLUX response document.
0..1	Rejection Reason	Att.	Text	The rejection reason, expressed as text, in this FLUX response document.
0..1	Type	Att.	Code	The code indicating the type of this FLUX response document.
0..n	Related	Ass	Validation Result_ Document	A validation result document in this FLUX response document related to a FLUX report document.
0..1	Respondent	Ass	FLUX_ Party	The respondent FLUX party for this FLUX Response.

Validation Result_ Document Entity

Description: Entity containing a collection of data that reports information or evidence of a validation.

Mult.	Business term	Rel.	Type	Description
0..1	Validator_ Identification	Att	Identifier	The identifier of the validator for this validation result document.
0..1	Creation	Att	Date Time	The date, time, date time or other date time value of a creation of this validation result document.
0..n	Related	Ass	Validation_ Quality Analysis	Quality analysis related to this validation result document.

Validation_ Quality Analysis Entity

Description: Entity containing the data that demonstrate conclusively whether or not the validation process meets a requirement.

Mult.	Business term	Rel.	Type	Description
0..1	Identification	Att	Identifier	The identification of this quality analysis of validation process.
0..1	Description	Att	Text	The textual description of this quality analysis of a validation process.
0..1	Level	Att	Code	The code specifying the level of this quality analysis of validation process.
0..1	Type	Att	Code	The code specifying a type of quality analysis of validation process.
0..n	Result	Att	Text	A result, expressed as text, in this quality analysis of validation process.
0..n	Referenced_ Item	Att	Text	A referenced item, expressed as text, for this quality analysis of validation process.

6.4.3 Query for information

A sender querying information from a receiver has to use a Query message which contains a general FLUX Business Layer Content message and follows the same rules.

6.4.4 Query Declaration:

Description: A *Query* entity is used by an actor requesting information from another actor. A *Query* declaration will be contained in a *Basic Attributes* entity in the same way as for *Exchange Document Info* or *Response* entity. The definition of the possible queries and the information that must be provided is defined in each individual business domain.

Note: One special query type could be foreseen to allow the systems of a sender to gain information about the business systems of a recipient. For example, this polling mechanism could be used to verify if business systems are operational, which version of XSD these systems implement, when maintenance is scheduled, etc. If needed, this polling will be described in the "systems" domain.

6.4.5 Response to Query Declaration:

Description: A *Response* to a *Query* declaration is an extension of a normal *Response* declaration. It contains the information to return in response to a query for any kind of *Basic Attributes* declarations.
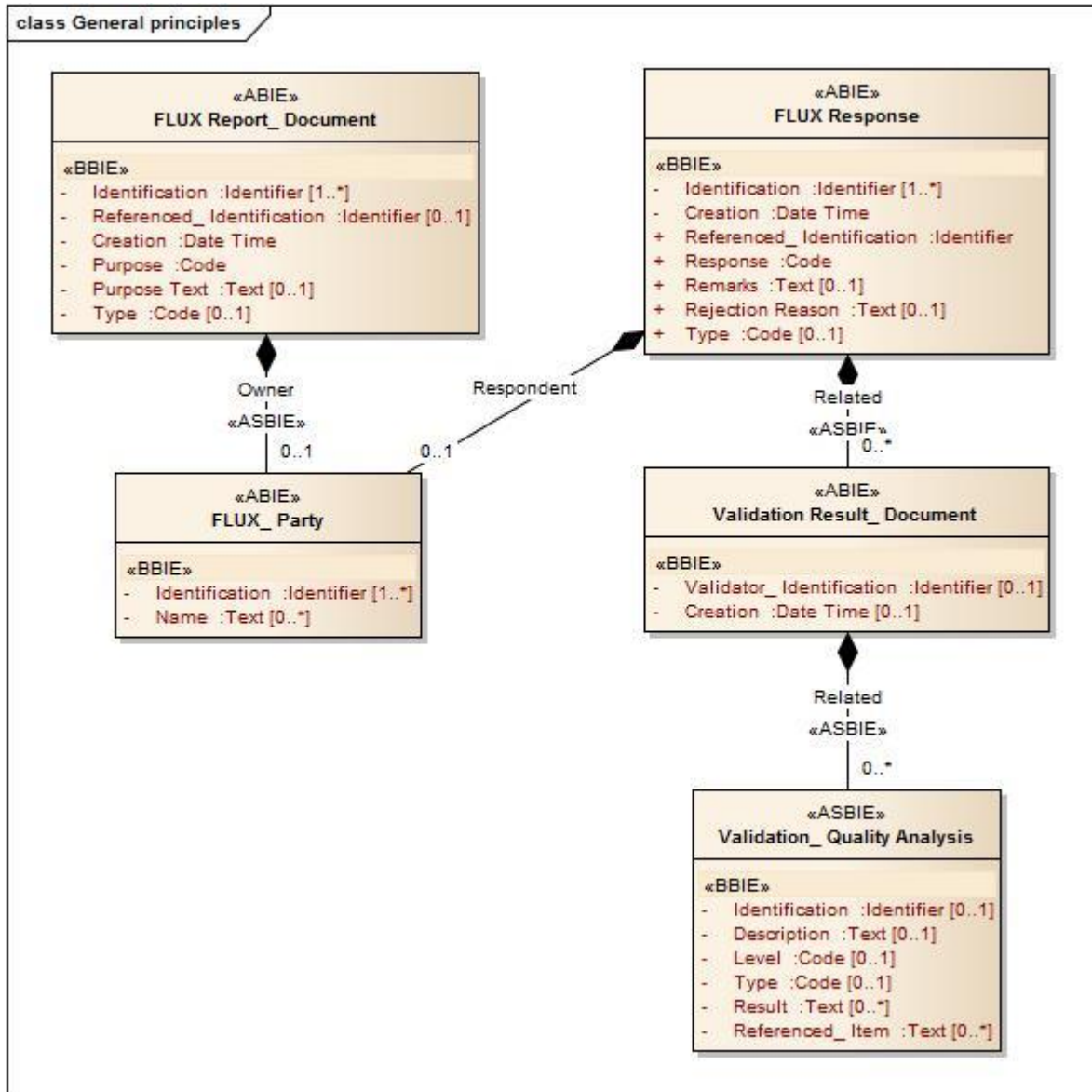
7 Annex

7.1 Entities Overview

Figure 6: Overview diagram of classes used in General Principles document