Paper for Consideration by NIPWG

[Results of designing Application Schema for S-128 Catalogue of Nautical products]

Submitted by:	Republic of Korea (KHOA)
Executive Summary:	This introduces the result of a S-128 Application Schema design and the production result of TDS in GML format which have been performed by KHOA.
Related Documents:	NIPWG2-29.1 Status of S-128 Product Specification for Catalogue of Nautical Products NIPWG1-21.2 Proposal of a new S-10X Prodspec on catalogue of charts and publications
Related Projects:	S-11 Part B INT GIS project

Introduction / Background

The NIPWG1 discussed a need for an S-100 based product specification on catalogues of nautical products. The NIPWG Chair suggested developing a new product specification at the HSSC7, thus the HSSC assigned a number 'S-128' to this product specification.

According to the discussions at NIPWG2, KHOA is highly interested in S-128 standard and has been working hard to standardize S-128 by suggesting the standard data models for 2015. As you known, it is that the S-128 was proposed at NIPWG1, and its plan was announced at NIPWG2.

As a result, KHOA produced the draft of data model on catalogues of nautical products as research activities for suggesting S-128 standard in 2016.

Data model standard was made based on the data discussed at NIPWG2 and this agenda contains basic information about the data model. As a result of drafting S-128 data, we found out that there should be more discussions on extent of identification criterions on nautical products. We should not only check and exchange the latest data easily but also establish standards considering applications of various products except for S-10X in the near future.

Analysis/Discussion

Target extent of Standard data model of S-128 was identified after searching domestic and international nautical products.

The work process has consisted of three stages : surveying the status and setting the scope, designing the data model, and producing demonstration data.

As the result of survey carried out within Korea, there are three categories ; the charts are classified as Navigational Charts in paper and ENCs, the navigational publications such as Sailing Directions, Light Tables, Tide Tables, etc., and various thematic maps. Some of the e-Navigation services are also included here.

As a result of international investigation, First of all, we analysed extent of coverage and table map of detail information by analysing data model of INT chart in S-11 Part B. Second, catalogues of UKHO-chart and online-catalogue system data are appeared to be categorized into Raster and Vector.

Therefore, we categorized common and individual attributes of nautical products through the case-studies and made data model which contains common attribute.

To define the classification criterion based on S-100 standard, progress of S-128 data model production could be classified roughly into Feature type for catalogue of product which must contain Geometry information and Information type for catalogue of product in which Geometry information isn't required. Also, it is structured to inherit each from Feature type class of S-100 standard and Information type class.

Note: FOR REASONS OF ECONOMY, DELEGATES ARE KINDLY REQUESTED TO BRING THEIR OWN COPIES OF THE DOCUMENTS TO THE MEETING
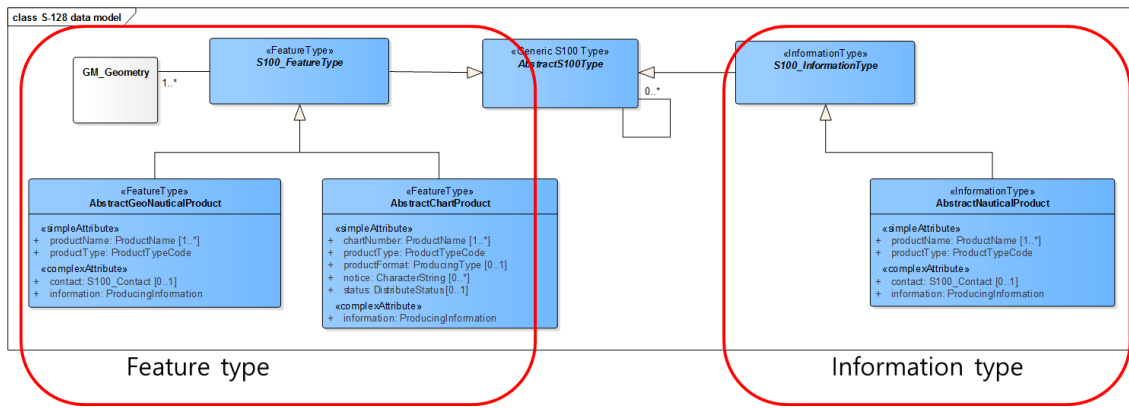
Figure 1. Feature type and Information type

In other words, Whole data model is classified roughly into Feature type and Information type and defined subordinate classes. Feature type products are defined to location information-included Geometry Nautical Product and Chart Product used to regulate charts which are already produced with various products. Furthermore, Feature type products modeled its common attributes in each product to Abstract class. Abstract Chart Product class means common attributes of paper chart and electronic chart such as S-57 and S-101. In succession, Information type products classified products that can't contain or need to contain location information to catalogues of product as one group of products and modeled its common attributes to Abstract class. The fact that the location information does not need to be included in the catalogues of product means that the internal attributes of the product is ambiguous to describe the location information in the catalogues of product even though it has the location information. List of light published as a book is a good example. Because even if each lights in the book contains location information, it is hard to specify the area of the whole book. In addition, many types of electronic-based products are classified into information types when the components in the product have location information but it is difficult to express the location information for the whole product. Almost every product except for chart belongs to the Information type which include not only Traditional Product published as paper or book but also, Electronic products produced as E-Book or App.
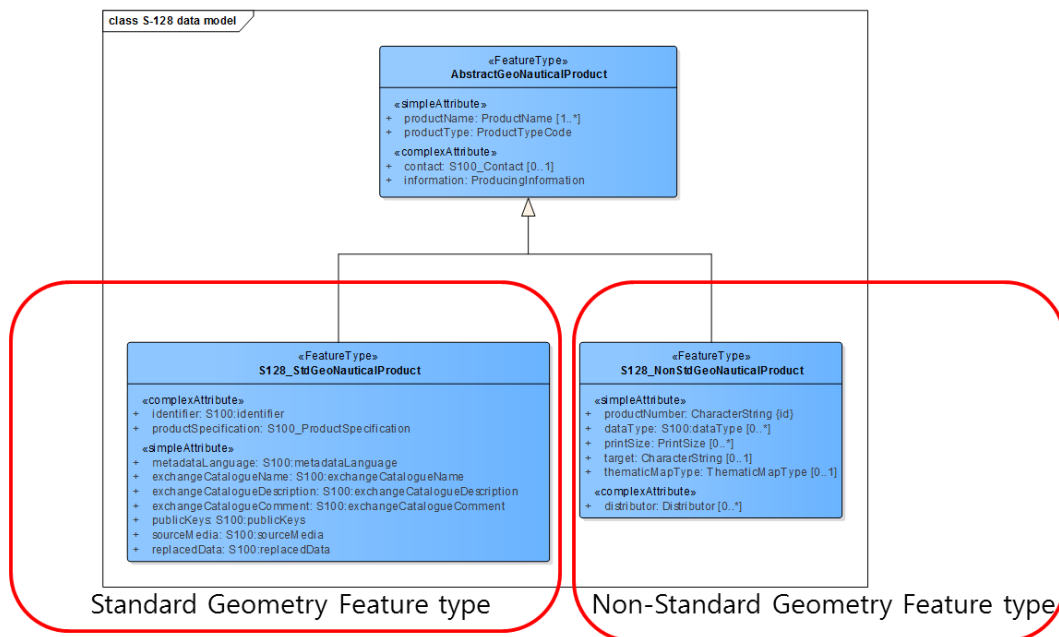

Figure 2. Standard Geometry Feature type and Non-Standard Geometry Feature type

Geometry Nautical Product in Feature type is roughly classified as products based on S-100 and non-standard products and defined each group of products to StdGeoNautical Product class and Non-StdGeoNauticalProduct class. This is a structure that separates the common attributes of the feature type into a NonStdGeoNauticalProduct class and inherits it again from this Abstract class. We extracted attributes from GeometryNauticalProduct by classifying products based on S-100 like S-102, S-111, S-112 and non-standard products like Thematic Map.
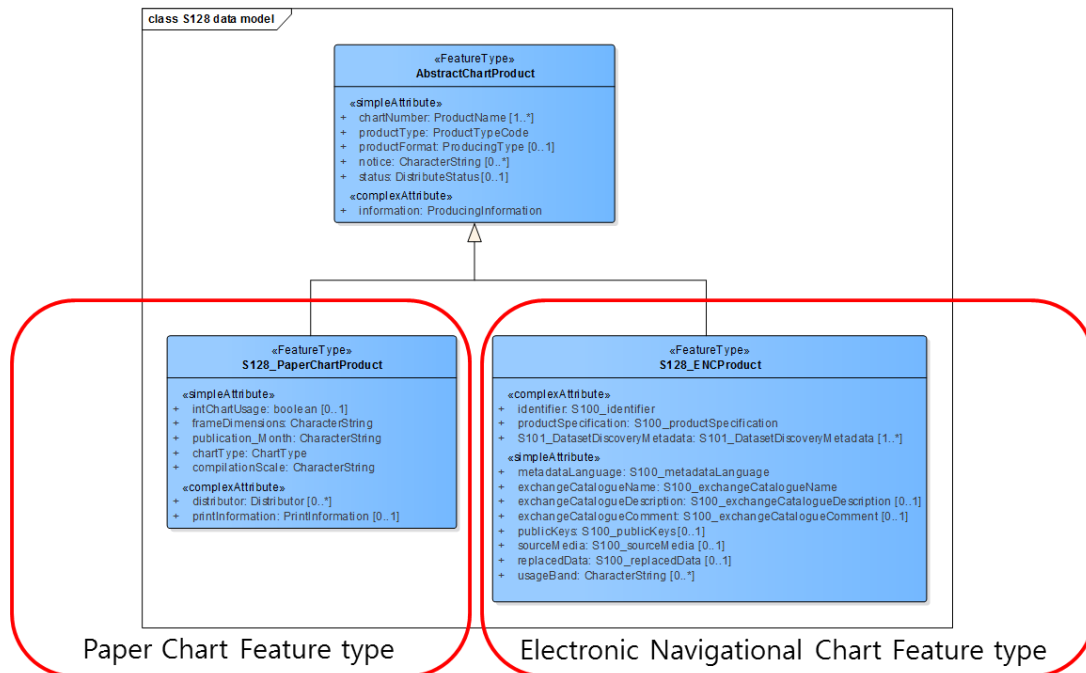
Figure 3. Paper Chart Feature type and Electronic Navigational Chart Feature type

Among the feature types, chart products are defined as paper Chart Feature type and Electronic Navigational Chart Feature type, specifically PaperChartProduct class for paper charts and ENCProduct class for electronic charts. Common attributes are integrated to AbstractChartProduct class and individual attributes are defined to PaperChartProduct class and ENCProduct class separately. For ENC product class, refer to 'Exchange set catalogue for S-101'.
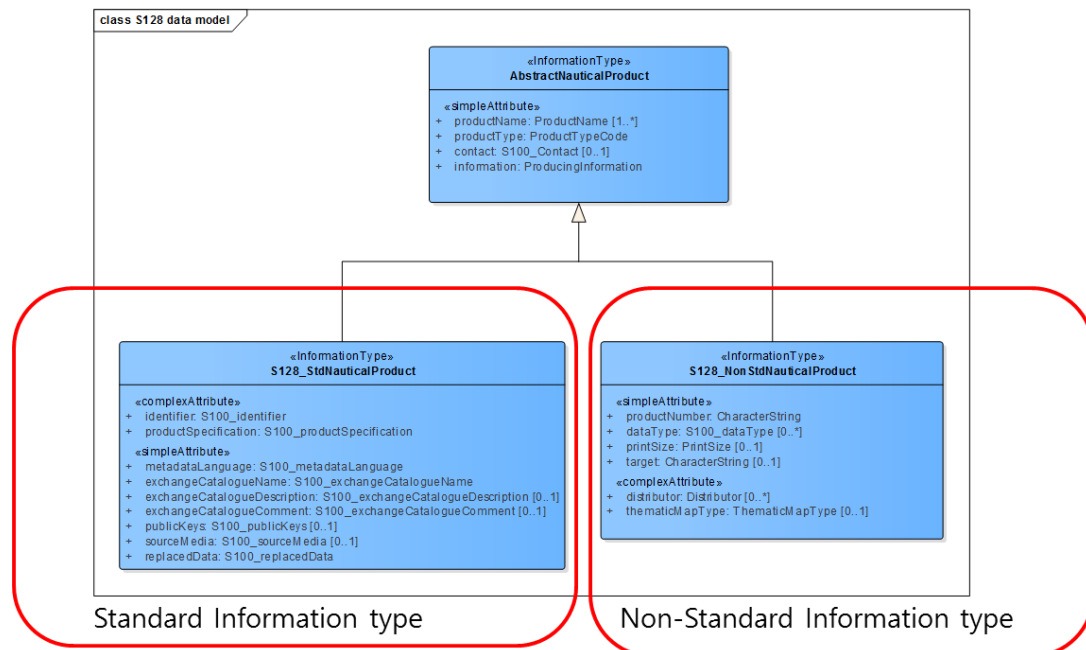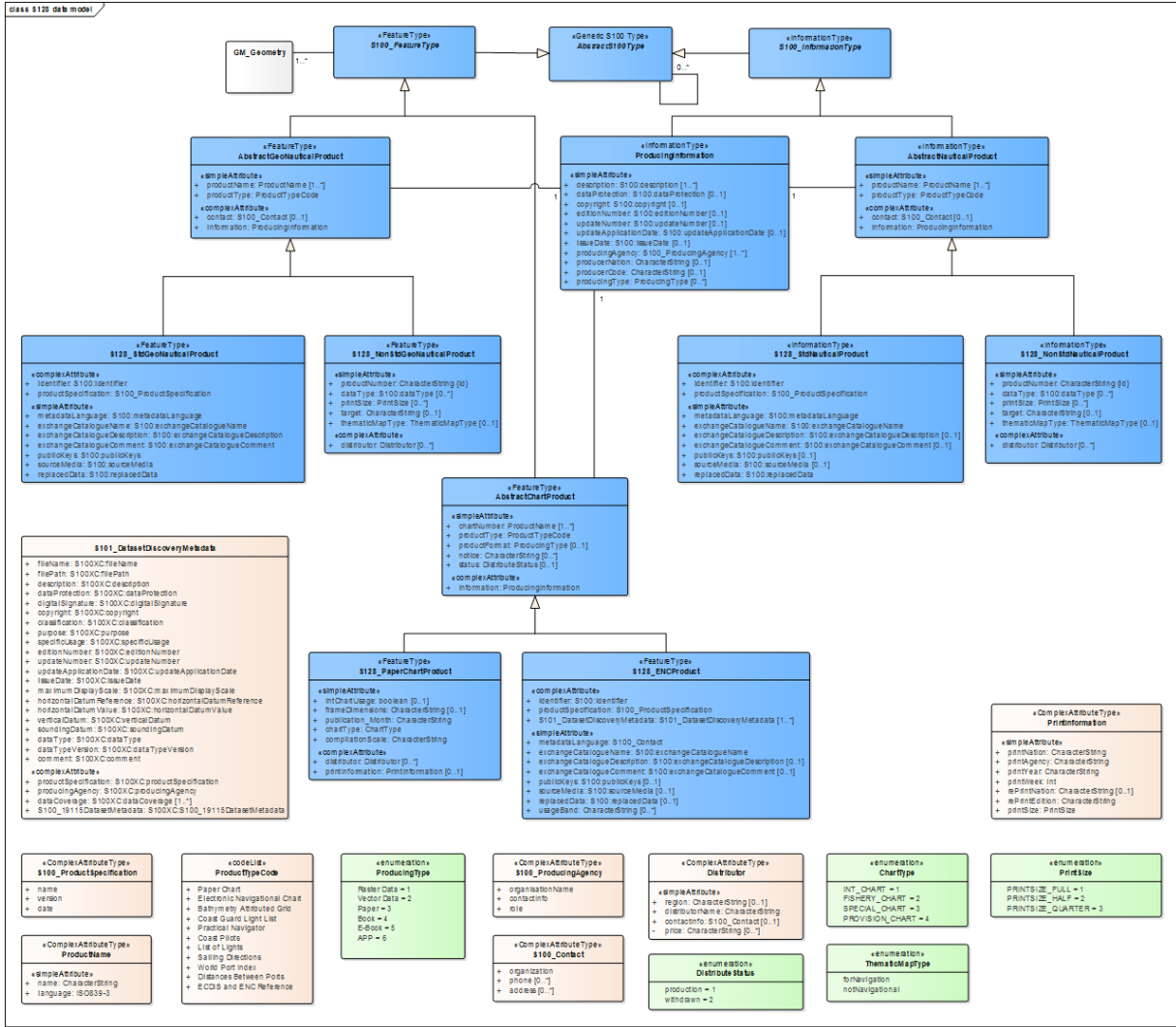

Figure 4. Standard Information type and Non-Standard Information type

The information type products are classified to the products based on the S-100 standard and the other non-standard products, and are defined as the information type of the StdNauticalProduct class and the NonStdNauticalProduct class. Therefore, their structure is a system that separates common attributes into AbstractNauticalProduct and inherits again from this Abstract class. Information type products are classified to standard products based on S-100 such as S-124, S-126, and non-standard products such as Coast Guard Light List, Practical Navigator, Coast Pilots, List of Lights, Sailing Directions, World Port Index and Distances Between Ports and extracted its attributes.

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Conclusions

The final diagram of the modeling based on the foregoing is as follows.

Feature type based on positional information(Geometry information) is defined to StdGeoNauticalProduct class, NonStdGeoNauticalProduct class, classPaperChartProduct class and ENCProduct while Information type is defined to StdNauticalProduct class based on S-100 standard and NonStdNauticalProduct class.

Action Required of NIPWG

The NIPWG3 is invited to:
   a.   Note the progress of discussion on S-128.
   b.   Check S-128 data model and ask for more comments such as being added or revised.