Gap analysis for S-100 Exchange set model

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1. Introduction

- The various product specifications have used different versions of S-100, with most being built according to S-100 Editions 3.0.0 and 4.0.0.

- When the product specifications are ready for producing datasets by member states, the exchange set model will be an important component of the distribute process of the S-100 based products

- For that reason, **the exchange set model should be reviewed to ensure it meets the requirements of the various product specifications**.

2. Simple Usage scenarios of S-100 based product spec. exchange sets

- Product specifications developed to date and available for review has been analyzed for their use of the S-100 exchange set concepts.

- Types that are applicable for the individual specification are listed.

Below table is detailed listing of how each product specification used the basic types.

Exchange set usage scenarios:	Explanation
New dataset(s)	Exchange set that includes one or more new edition datasets of the same product specification type. May include support files.
New update(s)	Exchange set that includes one or more updates to already issued datasets of the same product specification type. May include support files.
Re-issue dataset(s)	Exchange set with a re-issue of one or more dataset(s) of the same product specification type and with one or more updates constructed in a manner that includes the updates in the dataset(s) and permits the update(s) numbering to continue to increment and edition number remain unchanged.
New Edition dataset(s)	Exchange set that contains dataset(s) that terminates previous edition of the same dataset of the same product specification type, and adds a new edition.

2. Simple Usage scenarios of S-100 based product spec. exchange sets

Exchange set usage scenarios:	Explanation
Terminate dataset(s)	Exchange set that terminates one or more datasets of the same product specification type.
New support file(s)	Variation of exchange set that updates one or more datasets and/or adds new support file(s).
Replace support file(s)	Variation of exchange set that updates one or more datasets and replace support file(s).
Delete support file(s)	Variation of exchange set that updates one or more datasets and delete support file(s).
New FC/PC	Updates FC and/or PC of the same product specification type.
Replace FC/PC	Replaces FC and/or PC of the same product specification type.
Delete FC/PC	Deletes FC and/or PC of the same product specification type.
Multi type exchange set	Exchange set that contains a combination of one or more instances of any of the above scenarios.
Multi type and multi product specification exchange set	Exchange set that contains a combination of one or more instance of any of the above scenarios and exchange sets of different product specifications.

3. Limitations in the S-100 Edition 4.0.0 Exchange Set data model

• Reviewing the scenarios envisioned within each product specification listed against the S-100 Edition 4.0.0 Exchange set model (S-100 Part 4a) some **possible gaps** has become apparent and should be investigated.

1) With more and more product specifications being developed it should be noted that not all have been created for a direct usage for navigation. It may therefore be useful to indicate which product specifications are intended for navigation. Metadata could be a good place for such information.

2) Some product specifications (S-122, S-123 and S-127) have defined metadata used for providing delta changes between new editions. There is a need for considering making these standardized within S-100 or alternative ways of harmonizing how metadata for delta changes are handled.

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3) Considering the S-98 Interoperability Catalogue paradigm is expected to be combined with exchange set packages of combinations of products from multiple product specifications, should there also be an indication to say a set of products is the minimum safe set for a particular area.

4) S-124, and likely also S-412, makes use of a specialization for cancelling datasets. Should this method, once finalized, be included at the S-100 level to ensure machine readability?

5) Most if not all product specifications can expect updating of feature and/or portrayal and/or interoperability catalogues. The method of this process and metadata to support it should be considered for inclusion in S-100 to harmonize the functionality.

6) The Feature/Portrayal catalogues are specialized support files and do not have a means of updating an old version with a new version.

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7) S-100 Part 4 currently contain an ambiguous naming convention for the product specific exchange set files and this convention is hidden in the Remarks column of the S100_ExchangeCatalogue class. Machine readability may be improved by a standardized naming convention.

8) The remarks column of the S100_ExchangeCatalogue class mention only S-101, and it is unclear if it applies to all products.

9) The 'purpose' attribute in S100_DatasetDiscoveryMetadata has no standardized values, meaning each product specification must be hardcoded in any system expected to read the product. There could be benefits from standardizing the list.

10) Consider making a new data type for external resources, since there currently is no means of expressing this function in a feature catalogue and therefore increases the likelihood of meaning each product specification must be hardcoded in any system expected to read the product.

4. Conclusions and Recommendations

- **The ten gaps** that have been discovered should be analyzed and validated with proper means, and once validated should motivate change proposals towards the next version of S-100. The gaps were reported at the TSM7, which agreed that exchange and discovery metadata will be moved to a separate part in S-100.

- **It is recommended that a correspondence group should be formed to work on creating a new S-100 part of exchange and discovery metadata for S-100 Edition 6.**

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