S-101 Association roles - Comments

Submitted by:	Portolan Sciences LLC
Executive Summary:	Revision of S-101 Associations
Related Documents:	S101 PT12 6.10
Related Projects:	S-101

Introduction

Capturing feature and information associations in the S-101 Feature catalogue is consuming large amounts of time and labour in the S-101 Project Team and appears likely to continue to do so in the future. Contributory to this problem are the sheer volume of associations in the S-101 model.

References

S-100 Edition 5.x Universal Hydrographic Data model

S-101 PT12 6.10 Association Roles in S-101

Background

S-100 contains language concerning default role names. S-100 clause 3-5.4.5 contains the following rules for default role names. Attention is drawn to rule 2 in particular. While individual product specifications are free to deviate from the rules for default role names, they are still guidance that should be considered.

Extract from S-100 clause 3-5.4.5:

> 1) If only one end of an association is given an explicit name "<rolename>", the other end shall have the default name "inv_<rolename>".

> 2) If neither end of the association is given an explicit name, the default role name is "the<target class name>" in which the target class is referenced from the source class.

> 3) The above rules may not result in a distinct name for each association end in an Application Schema, so Product Specifications may define different or additional rules if needed.

> 4) If standard names are desired, the following defaults may be used instead of those listed above.

>> a. The role "additionalInformation" is a default role name for associations from feature to information types.

>> b. Feature/feature or information/information associations navigable in only one direction may use the default end names "source" and "target". The name "associatedWith" may be used at both ends of a bidirectional association.

Application schemas in other product specifications frequently use more descriptive role names than S-101 (e.g., "theContactDetails" in an association to Contact Details, "theAuthority" in an association to an Authority info type). The naming of roles in S-101 in particular for information types is a legacy from S-101's original concept that "The role additionalInformation should be the single information binding in S-101".

Recommendations

Recommendations for role names

Existing S-101 role name	Target class	Proposed new role (* = exists in GI registry)

providesInformation	Contact Details	theContactDetails (*)
providesInformation	Non-Standard Working Day	partialWorkingDay (*) in feature binding
		theServiceHours_nsdy in info binding from Service Hours (if present in S-101)
providesInformation	ServiceHours	operatingHours (new) from a geographic feature
		theServiceHours (*) from an Authority (information type)
providesInformation	NauticalInformation	additionalInformation (new)
updates		
defines		
definedFor		
identifies		
positions		

DCEG Recommendations

Add text to the S-101 DCEG front matter explaining roles in general, perhaps extracted from Part 1 of S-100. (This should be at least brief explanations referring the reader to S-100 for more information.) Readers of the DCEG readers have not read, or have overlooked S-100 (unsurprising given how long it is).

For future editions, devise a clearer way of describing associations and roles in the feature tables - the tabular forms which have been used in the current as well as past editions of the DCEG aren't exactly obvious.

Feature Catalogue recommendations

Many of the difficulties with the S-101 Feature Catalogue arise from the sheer size of the S-101 model, made worse by having to encode all the bindings of a feature type inside the feature type definition.

The Structure/Equipment association is one of the larger contributors – perhaps the largest contributor – to the complexity of the S-101 feature catalogue because at the least every structure feature must list every equipment feature in its equipment feature binding (or vice versa). This is assuming the binding is one-way; if it it is two-way then the converse is also true.

Feature catalogues for other product specifications (admittedly smaller in size) have not experienced commensurate difficulties.

Introducing abstract types would remove much of the duplication of bindings and make the feature catalogue much easier to prepare and check.

It is recommended that the S-101 model and feature catalogue, at a minimum:

- Add abstract types for Structure and Equipment (these are already defined in the GI Registry).
- Make structure-only feature types subtypes of Structure, and equipment-only feature types subtypes of Equipment.
- Define the structure-equipment binding between the Structure and Equipment abstract feature types and remove it from their sub-types.

The few types which can act as either structure or equipment will need special treatment; at worst, they could continue to be treated as separate individuals (as now), or some simpler approach might be devised.

It will not escape notice that:

- Other abstract types can be devised to simplify other parts of the S-101 model;

- Assigning common attributes to the abstract types simplifies the model and feature catalogue even more.

Considerations of time and schedule for completion may prevent a wholesale overhaul of the model and feature catalogue for Edition 2.0. However, the single simplification for Structure/Equipment is suggested for consideration now, as having the most impact. Other simplifications can be considered later.