All Fields marked with * are mandatory.

Change Request #:	173
Assigned OGC Document #:	11-151
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Document Name/Version:	*Requirements and Space-Event Modeling for Indoor Navigation / 0.1.0
OGC Project Document:	* 10-191r1

If this is a revision of a previous submission and you have a Change Request Number, then check here:
☐

Enter the CR number here: 172

Enter the Revsion Number that you are revising here: 1

Title:	*Direction Information for the Transition UML class in the data model
Source:	*JaeJun Yoo (OGC member, 3DIM WG)
Work item code:	
Category:	* C (Functional modification of feature)

| Reason for change: | *

When we model indoor spaces for location-based services such as indoor-navigation, we need to consider direction of navigable path (that is, whether a path is one way or not).

For example, let¡¯s think about security check doors or arrival doors at the airports. A customer can go forward through those |
|---|---|

doors but cannot go back. Therefore, we need to describe the direction of a path or a transition when modeling indoor space.

However, it is understood that there is no way to describe such directions of a path (or a transition) in the suggested data model. In the suggested data model, all transitions are bi-directional. Therefore, we need some modifications to the suggested model to resolve this problem.

(this is the revised change request)

Summary of change: *

please refer the uploaded file at supporting document field below (some statements, typos, and mistakes are corrected.)

Consequences if not approved:

Clauses affected: *

chapter 8, 10

Additional Documents affected:

Supporting Documentation:

Comments:

Status: Assigned

Assigned To: 3DIM DWG

Disposition: Referred

1. Reason for change

When we model indoor spaces for location-based services such as indoor-navigation, we need to consider direction of navigable path (that is, whether a path is one way or not).

For example, let's think about security check gates or arrival doors at the airports. A customer can go forward through those doors but cannot go back. Therefore, we need to describe the direction of a path or a transition when modeling indoor space.

However, it is understood that there is no way to describe such directions of a path (or a transition) in the suggested data model. In the suggested data model, all transitions are bi-directional. Therefore, we need some modifications to the suggested model to resolve this problem.

2. Summary of change

When modeling real indoor spaces, we need to consider 'direction' of a path or a transition. However, all transitions of the currently suggested data model are bi-directional; therefore, it is proposed to include direction information in the data model.

That is, we need to add direction information to "*Transition*" and "*InterSpaceConnection*" UML classes in the semantics area of the suggested data model. Also, according to duality property of the model, "*TP_Edge*" UML class in the topology area of the suggested data model need to contain the direction information.

Fig. 1 below describes the proposed way to describe such direction information in the data model. 1) "*Transition*", "*InterSpaceConnection*", and "*TP_Edge*" classes have an attribute to describe the direction (<u>one-way, two-way</u>), and 2) a "*State*" or "*TP_Node*" is referred by a specified role name (<u>from, to</u>) instead of the role name "*boundedBy*."
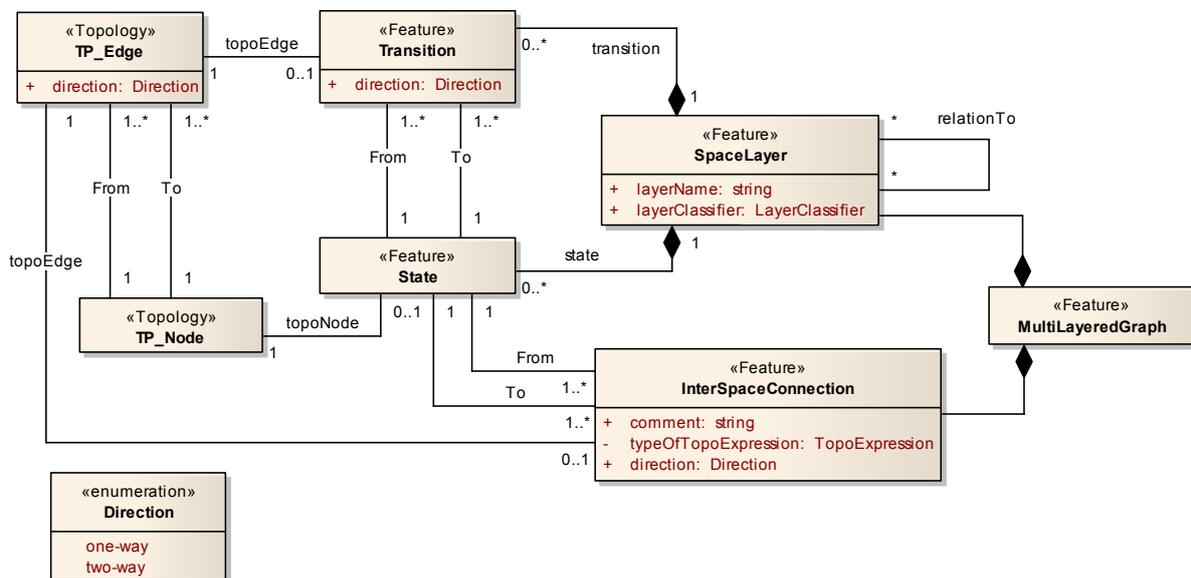

Fig. 1. Addition of direction information in the data model described in the discussion paper
(as part of "Fig. 28: Data Model of the Multilayered Space-Event Model" figure in the discussion paper)

Definitely, there can be another way to describe direction of a path or a transition, and it will be worth to be discussed.