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 not backwards.
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 (one-way, two-way), and 2) a “State” or “TP_Node” is referred by a specified role name (from, to) 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.