



Mapping, Modeling and Simulation in Landscape Architecture using CityGML Dynamizer

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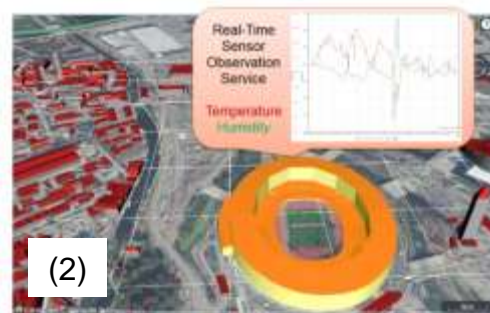
Institut Teknologi Bandung





Introduction (1)

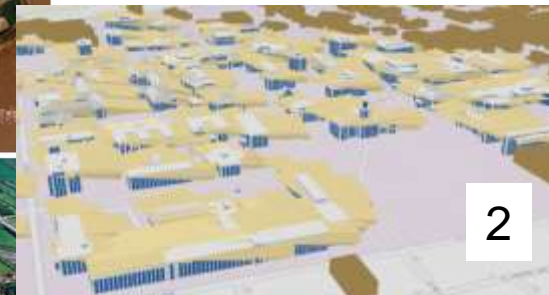
- Based on period of time taken for changes of a spatial-temporal object, there are two kinds of dynamic changes (Kolbe, et al., 2016):
 1. Slower changes
 2. Highly dynamic changes





Introduction (2)

- Based on the result of the dynamic changes of an object there are also two kind of change:
 1. permanent changes
 2. temporary changes

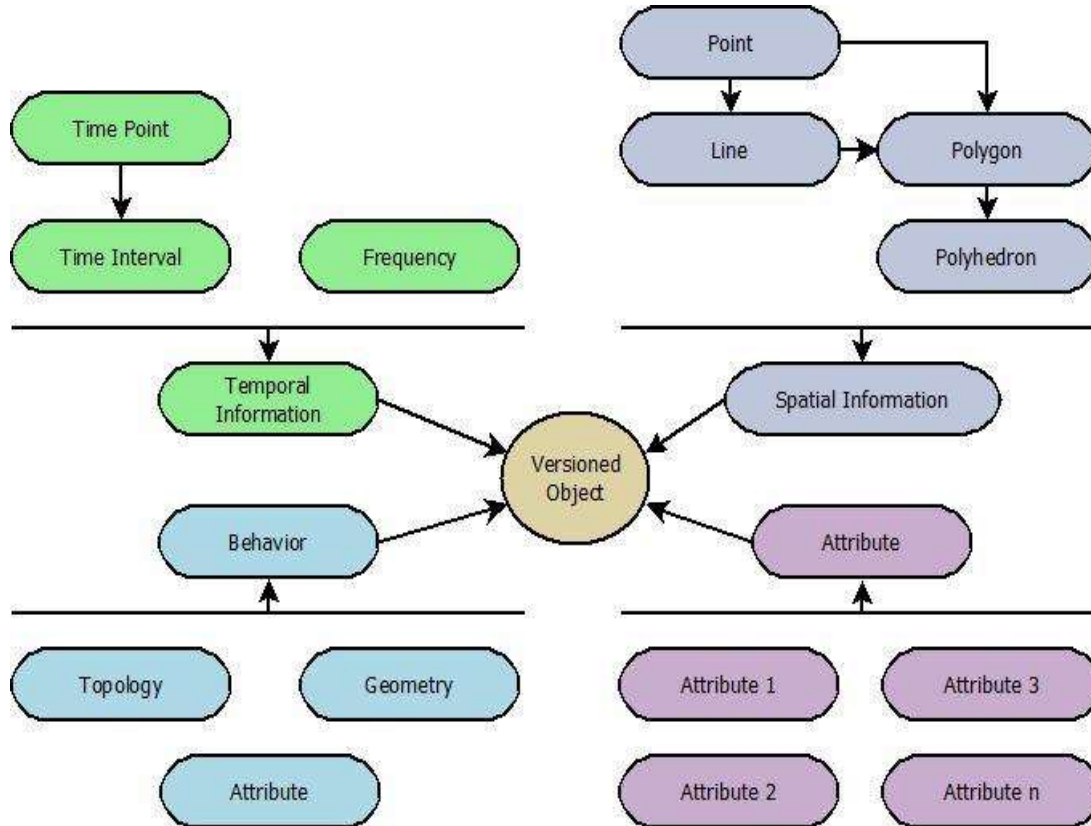




Research Problem (1)

- 3D city models requires highly dynamic and time-varying attribute
- Dynamizer is used for dynamic spatial data
- Existing structure of CityGML is a static
- Dynamizer has not provide the way to store dynamic geometric data

Related Research (1)



Constraint-Based Approach

Object Hierarchy of the Extended 3D Spatial-Temporal Model (Li, 2009)

Tags and Flags Approach

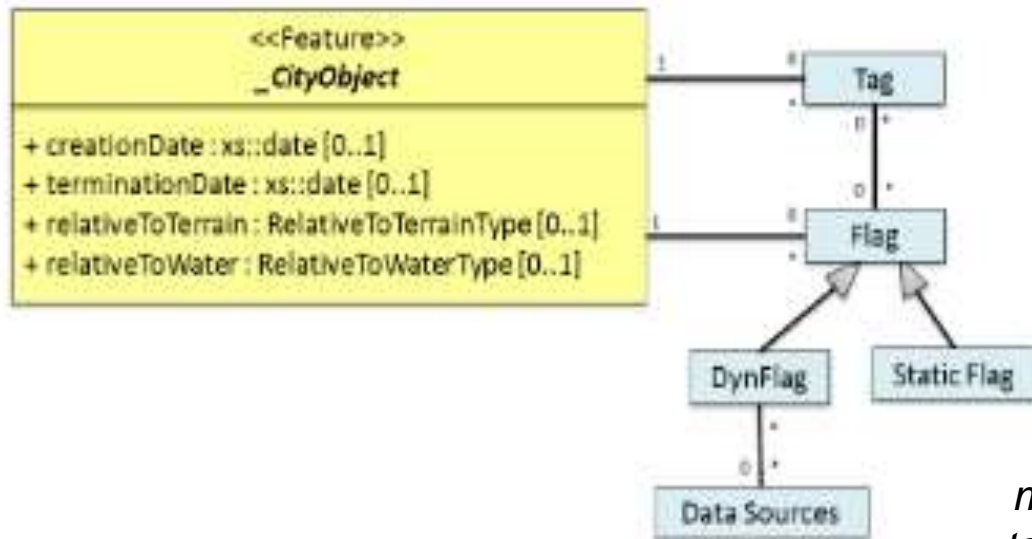


Figure 2 UML scheme modifications to take into account tags and flags (Morel, et al., 2014)



Semantic Approach

- Semantic approach is used on dynamizer.
- It defines two things:
 - A data structure to represent time-variant values in different and generic ways
 - A method to enhance static city model by time-variant/dynamic property values



Related Research

	Advantage	Disadvantage
Constraint-based approach (Li, 2009)	<ul style="list-style-type: none">• Includes “behavior” aspect• Constraints control data integrity and efficient topological queries	<ul style="list-style-type: none">• Focus in basic geometric type• Does not use CityGML standard
Tags and flags approach (Morel, et al., 2014)	<ul style="list-style-type: none">• Efficient for any kind of changes of the city objects• Could cope with more frequent data• Uses CityGML standard	<ul style="list-style-type: none">• Visualization of the spatial and temporal data aspect
Semantic approach (Kolbe, 2016)	<ul style="list-style-type: none">• Support multiple dynamic representations• Mappings of missing or multiple attribute values• Linking external sensors• Uses CityGML standard	<ul style="list-style-type: none">• It is not clear how the geometric aspect of the spatial properties are stored

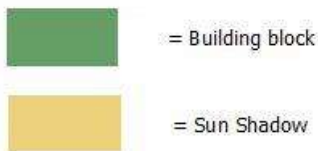
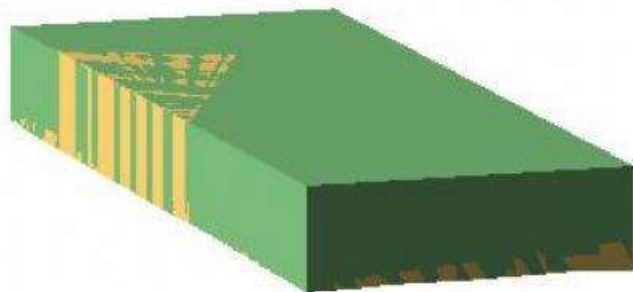


Conclusion

- Dynamic 3D city model is ongoing research.
- They are still lacking on how to store the geometry data, specifically by using CityGML.



Future Work



FID	Shape*	HUGS FEATR	SOURCE	SOURCE ID	DATE TIME	AZIMUTH	VERT ANGLE
0	MultiPatch M	0	gedung_en	0	2017-05-07 06:00:00	72,888973	1,768404
1	MultiPatch M	0	gedung_en	1	2017-05-07 06:00:00	72,888973	1,768404
2	MultiPatch M	0	gedung_en	2	2017-05-07 06:00:00	72,888973	1,768404
3	MultiPatch M	1	gedung_en	3	2017-05-07 06:00:00	72,888973	1,768404
4	MultiPatch M	1	gedung_en	4	2017-05-07 06:00:00	72,888973	1,768404
5	MultiPatch M	0	gedung_en	5	2017-05-07 06:00:00	72,888973	1,768404
6	MultiPatch M	0	gedung_en	6	2017-05-07 06:00:00	72,888973	1,768404
7	MultiPatch M	0	gedung_en	7	2017-05-07 06:00:00	72,888973	1,768404
8	MultiPatch M	0	gedung_en	8	2017-05-07 06:00:00	72,888973	1,768404
9	MultiPatch M	0	gedung_en	9	2017-05-07 06:00:00	72,888973	1,768404
10	MultiPatch M	1	gedung_en	10	2017-05-07 06:00:00	72,888973	1,768404

How does the geometric sun shadow is stored?

How does the geometric of building block that is affected by geometric sun shadow is stored?

THANK YOU

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