Intention and Situation based Information Filtering for Street Navigation*

(based on a paper presented in BigComp2014, Bangkok, Thailand)

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Jee-In Kim

KONKUK UNIVERSITY
Seoul, Korea

* Divya Udayan J, HyungSeok Kim, Jee-In-Kim, Keetae Kim, “Semantic Levels of Information Hierarchy for Urban Street Navigation”, BigComp 2014.

Direction to Akihabara

Real Akihabara May Look Like:

Representation of Location

Lookup a geographic location from :

- ❖ **Existing geographic scheme**
- ❖ **Individual location**

- ❖ **Simple and abstract description**
- ❖ **Real and complicated information are not always useful**

- **No user intention/preferences**
- **No mapping from simple description to complex real world**

Our Approach

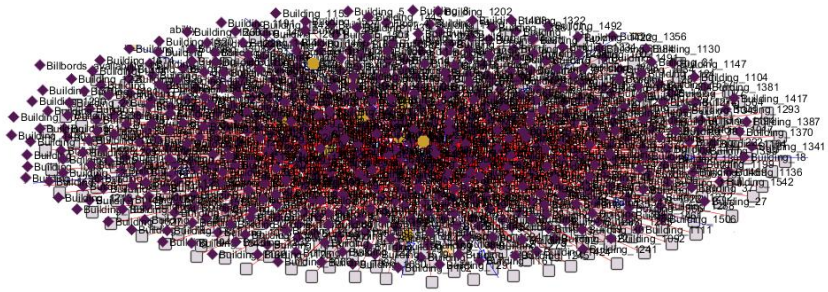
Extension of LOD by:

- Enhancing information based on user intention
- Reduce scene complexity by information filtering

Multi-Level Representation of Information

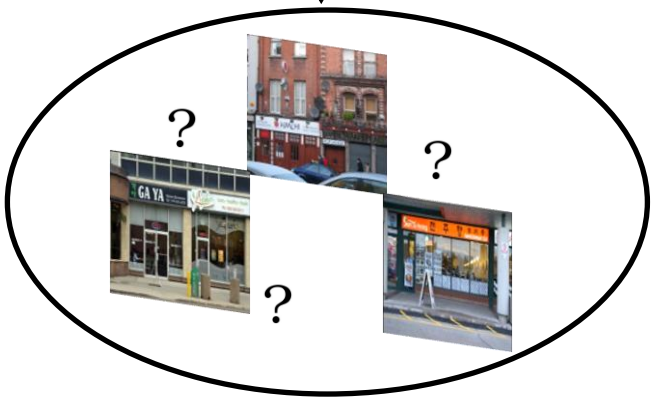
Information Filtering for LOD

Spatial Domain



User Intention/Preference

Spatial Select

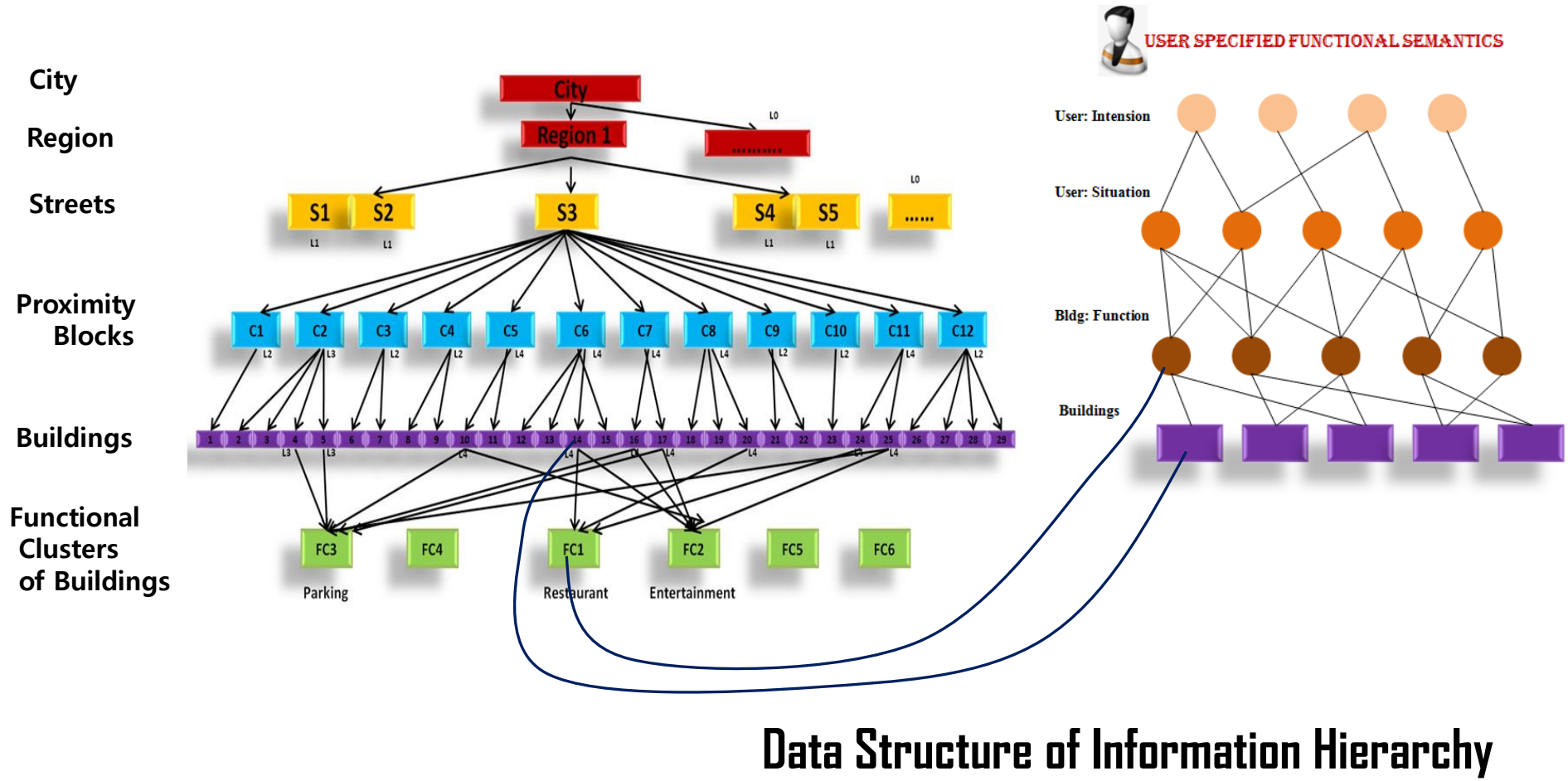


Information (Structural + Functional)

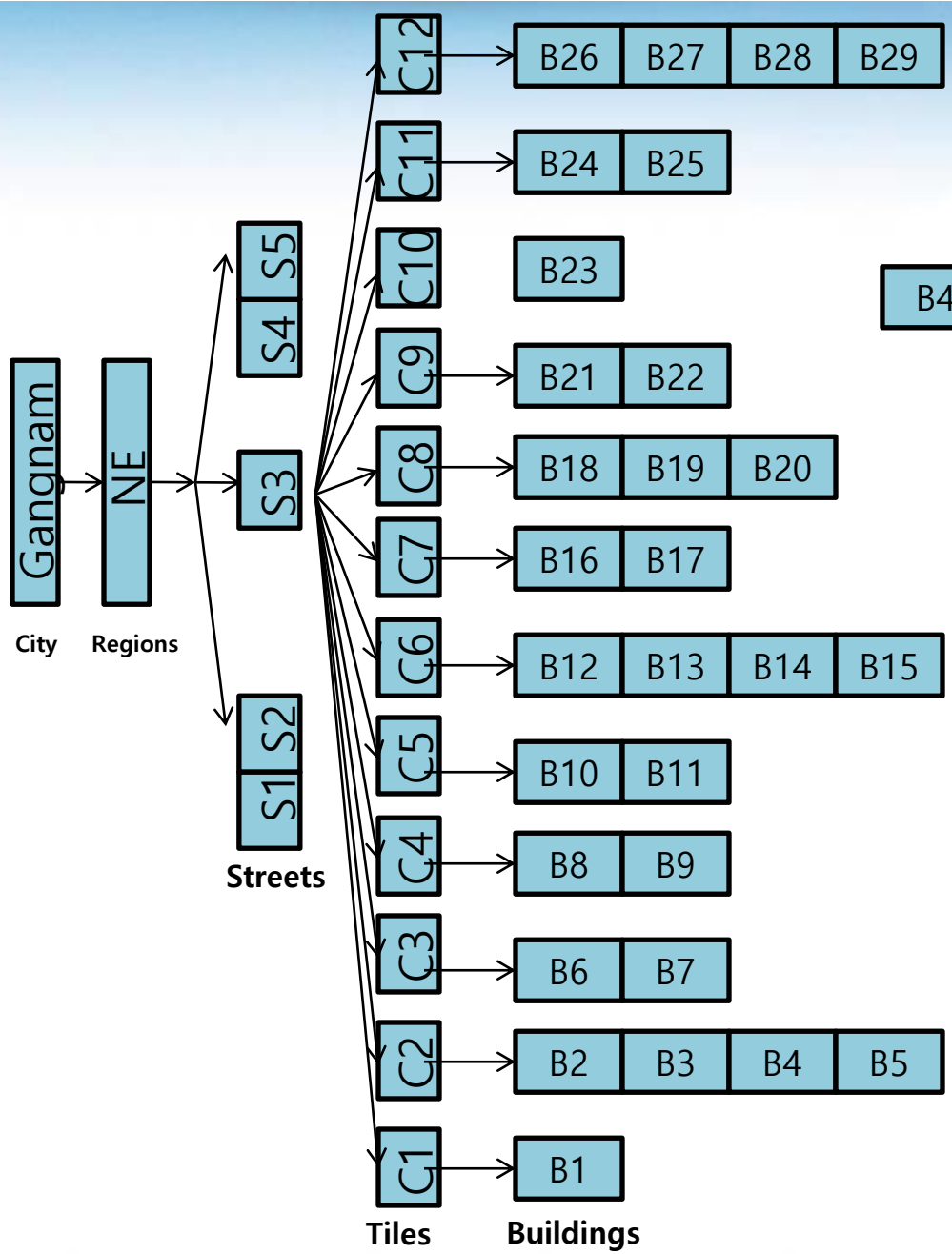
Ranks

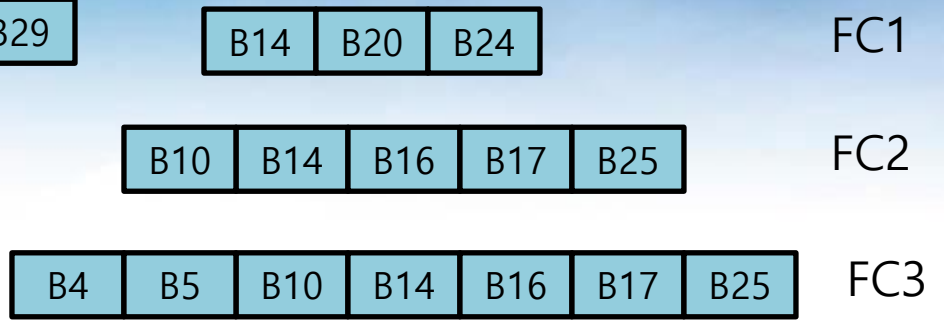
Different Visual Level Representations
Based on their Rankings.
The rankings are computed
by considering user intention/preference
and situation.

Multi-level Information Hierarchy



Data Structure of Information Hierarchy

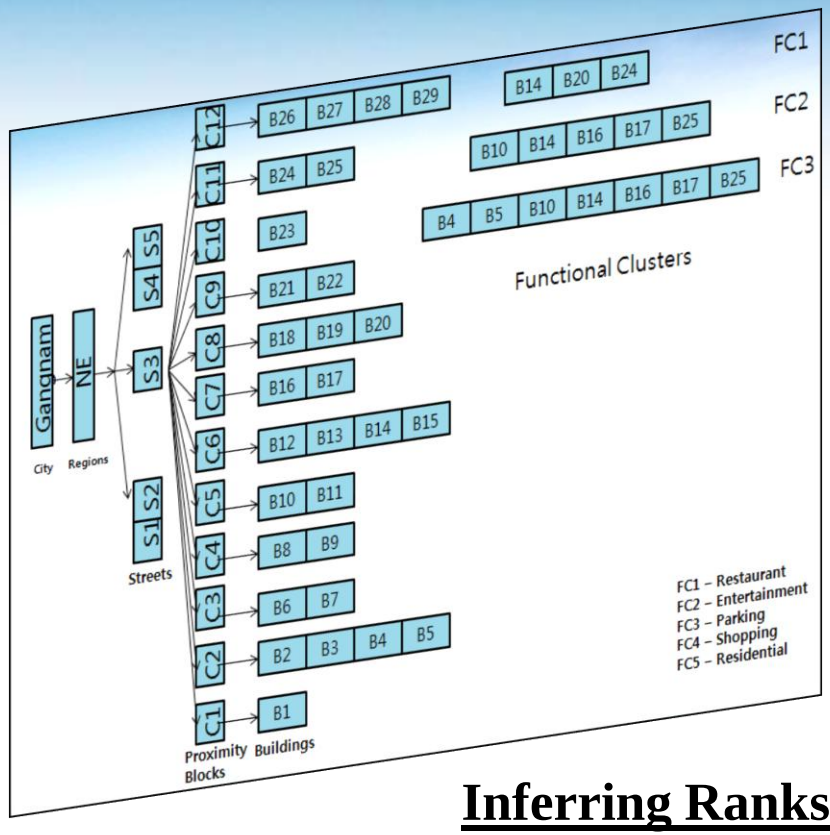




Functional Clusters

- **Intention (U)**: Movie & Dinner
- **Situation (U)**: Driving a Car
- **Functions (B)**: Restaurant, Entertainment, Parking

FC1 – Restaurant
FC2 – Entertainment
FC3 – Parking
FC4 – Shopping
FC5 – Residential



Query Conditions

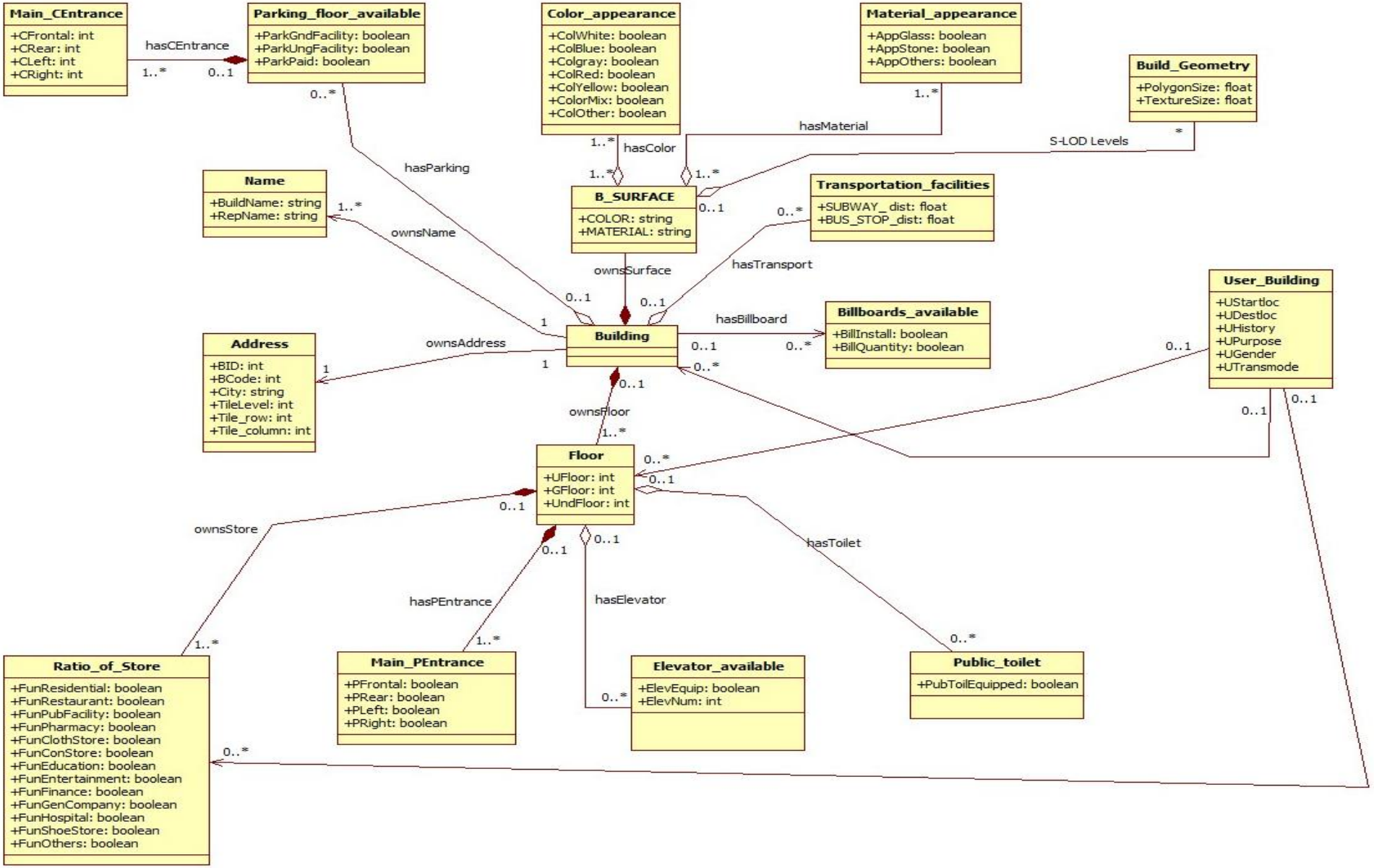
Rank 1(R1):
(RESTAURANT =true && ENTERTAINMENT=true && PARKING=true)
Rank 2(R2):
(RESTAURANT =true && ENTERTAINMENT=true && PARKING=false)
Rank 3(R3):
(RESTAURANT =true && ENTERTAINMENT=false && PARKING=false)
Rank 4(R4):
(RESTAURANT =false && ENTERTAINMENT=false && PARKING=false)

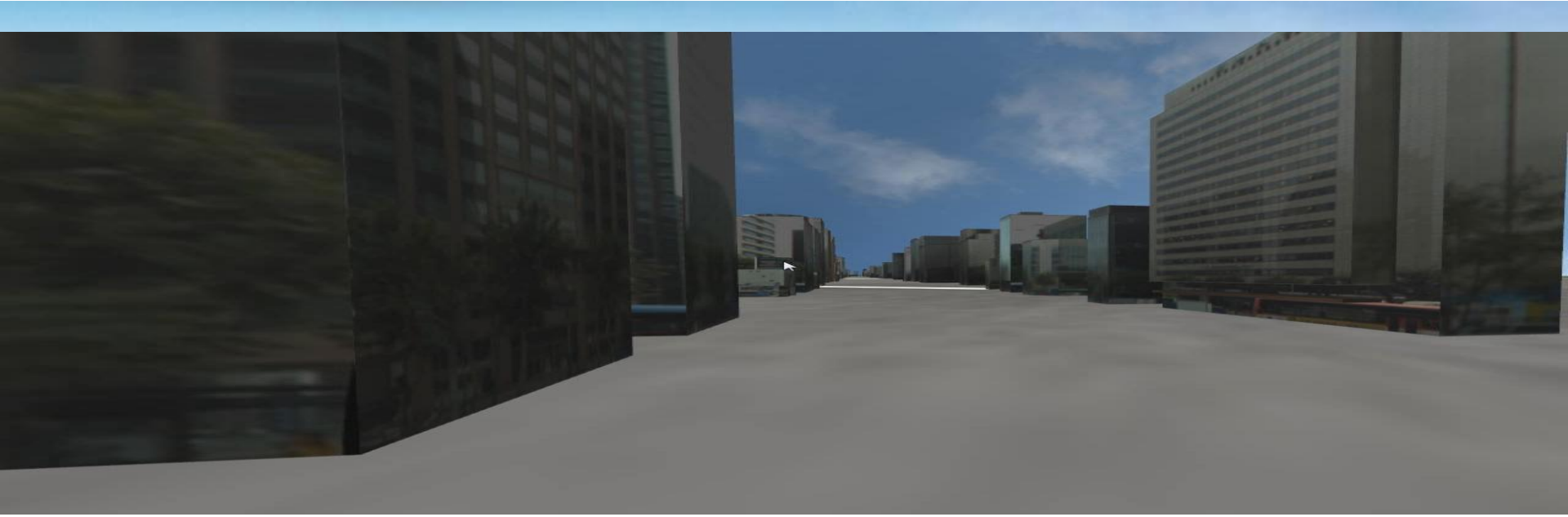
- **Levels of the Requirements may differ.**

Inferring Ranks & Distribution of Levels for Tiles

R1- LEVEL4	R2-LEVEL3	R3-LEVEL2	R4-LEVEL1
C6{B12,B13,B14,B15}	C8{B18,B19,B20}	C2{B2,B3,B4,B5}	C1{B1}
	C11{B24,B25}		C3{B6,B7}
	C5{B10,B11}		C4{B8,B9}
	C7{B16,B17}		C9{B21,B22}
			C10{B23}
			C12{B26,B27,B28,B29}

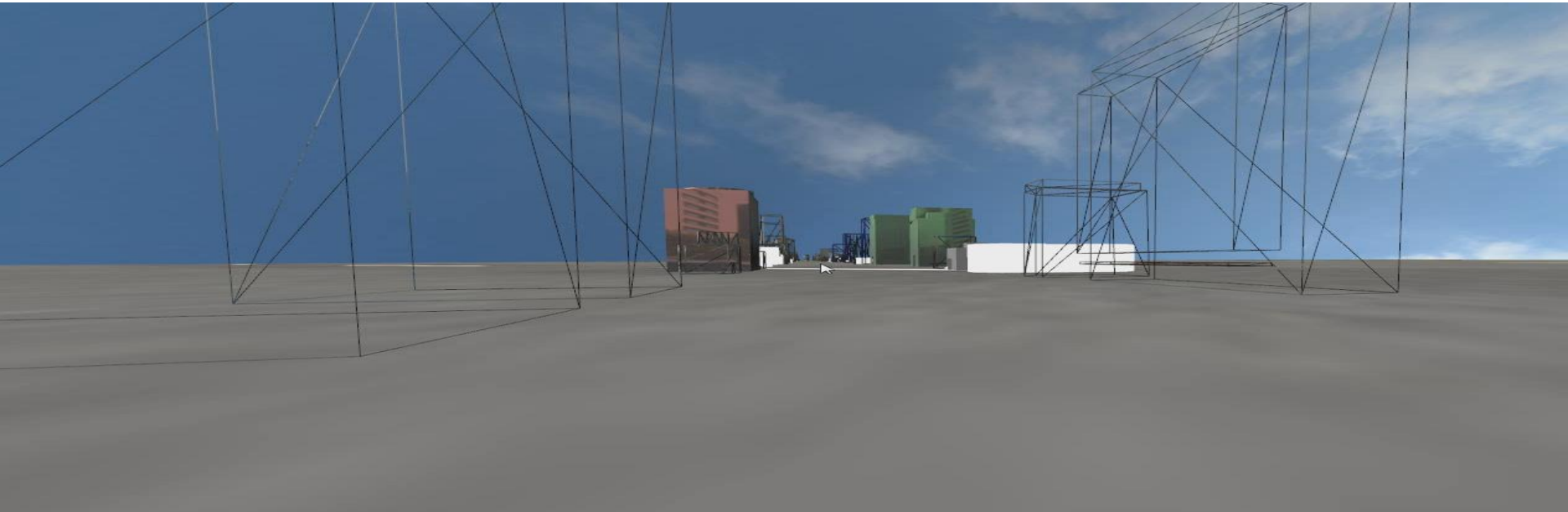
Data Base Schema





Without Information Filtering

With Information Filtering



Summary

- **Information Filtering** for LOD is the Key
- **Functions** of Buildings and their **Functional Clusters**
- User **Intention/Preference** and **Situation**
- A Mechanism of Matching the Intention/Preference and Situation to the Functions of Buildings ➔ LOD