Self-service Business Intelligence over On-Demand IoT Data: A New Design Methodology Based on Rapid Prototyping

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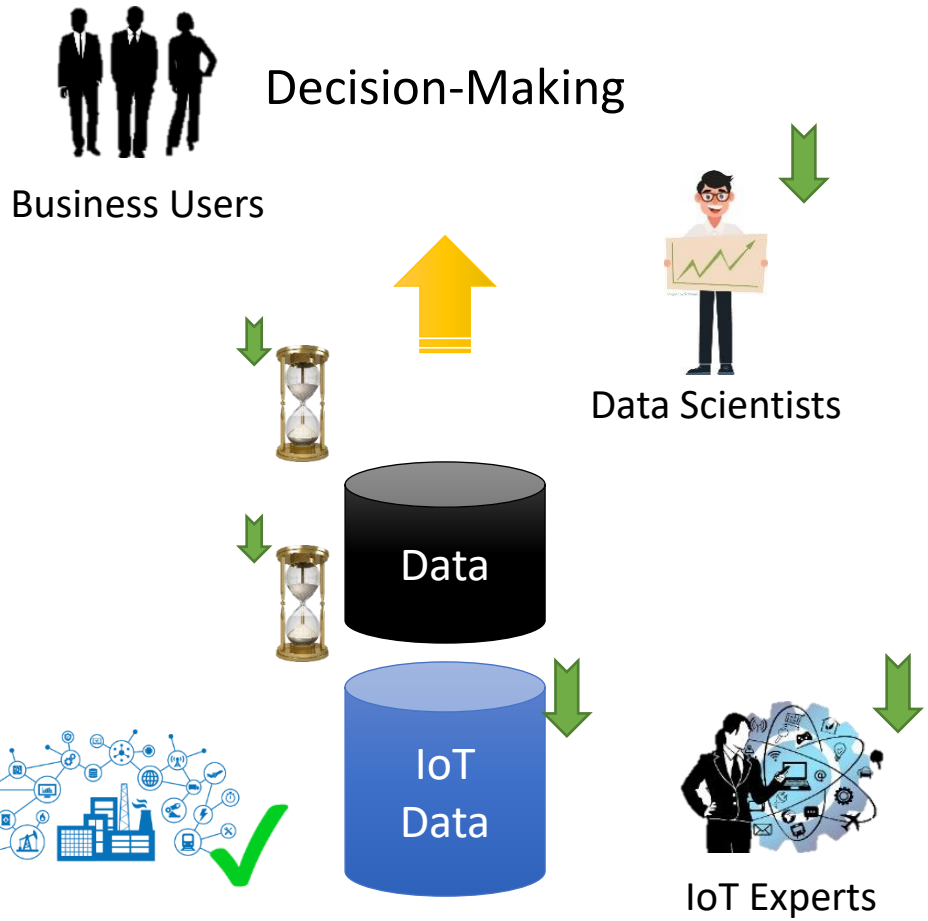
24th European Conference on Advances in Databases and Information Systems

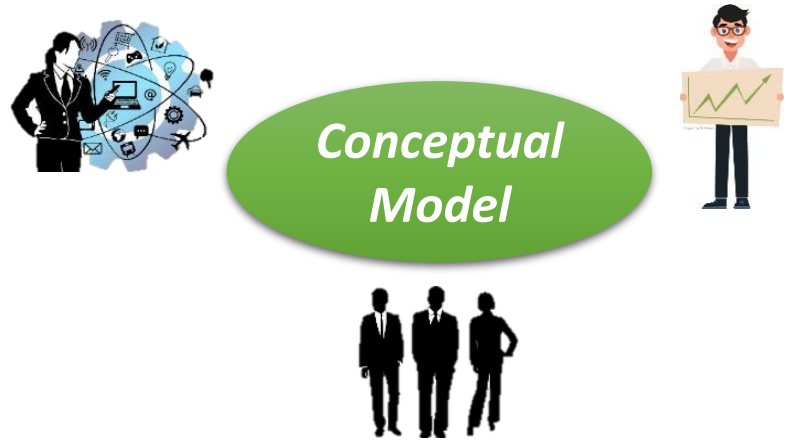
August 2020

The **data you deal with** is not always the **data you need**

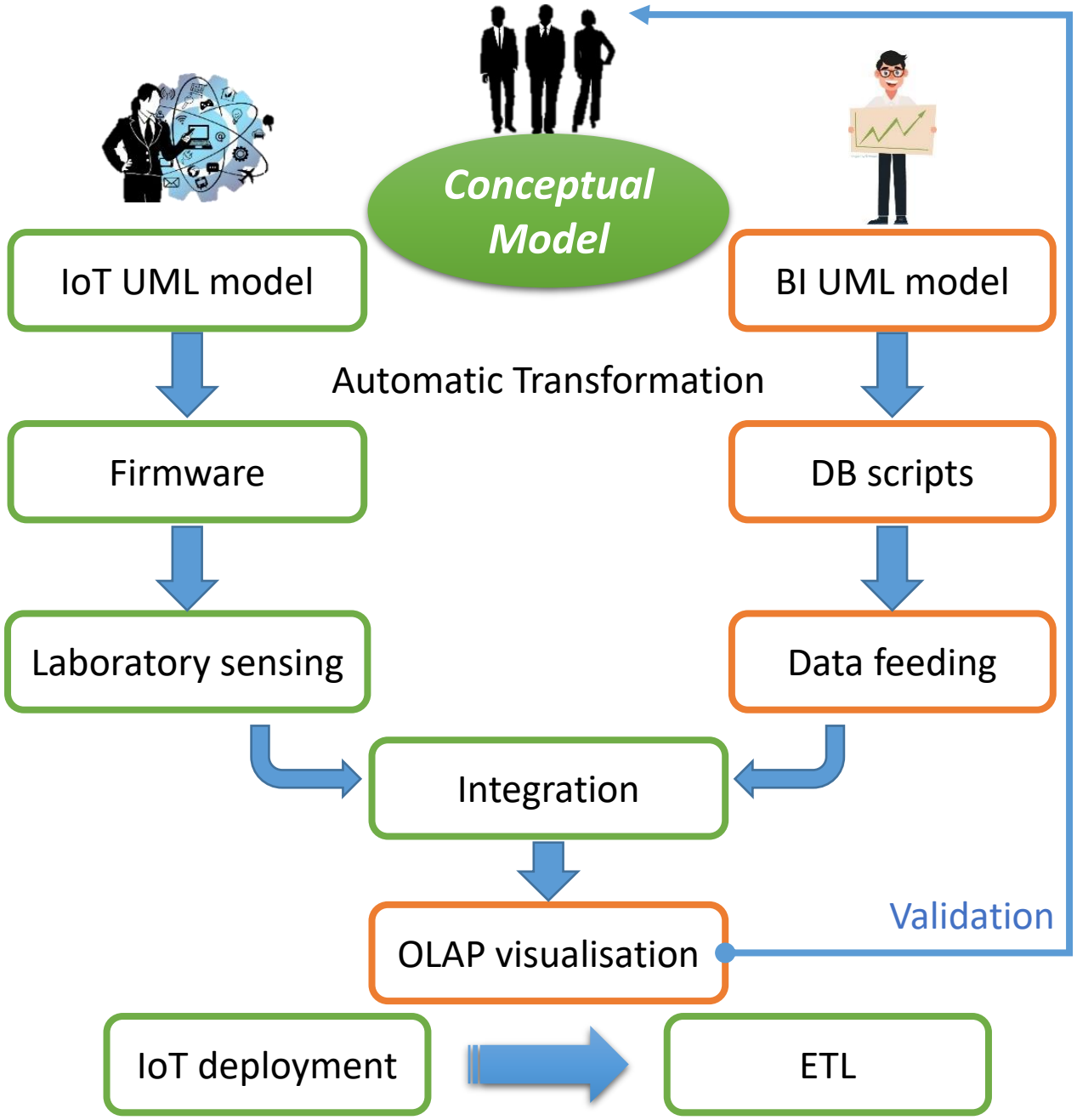


Self-Service Business Intelligence with On-Demand Data

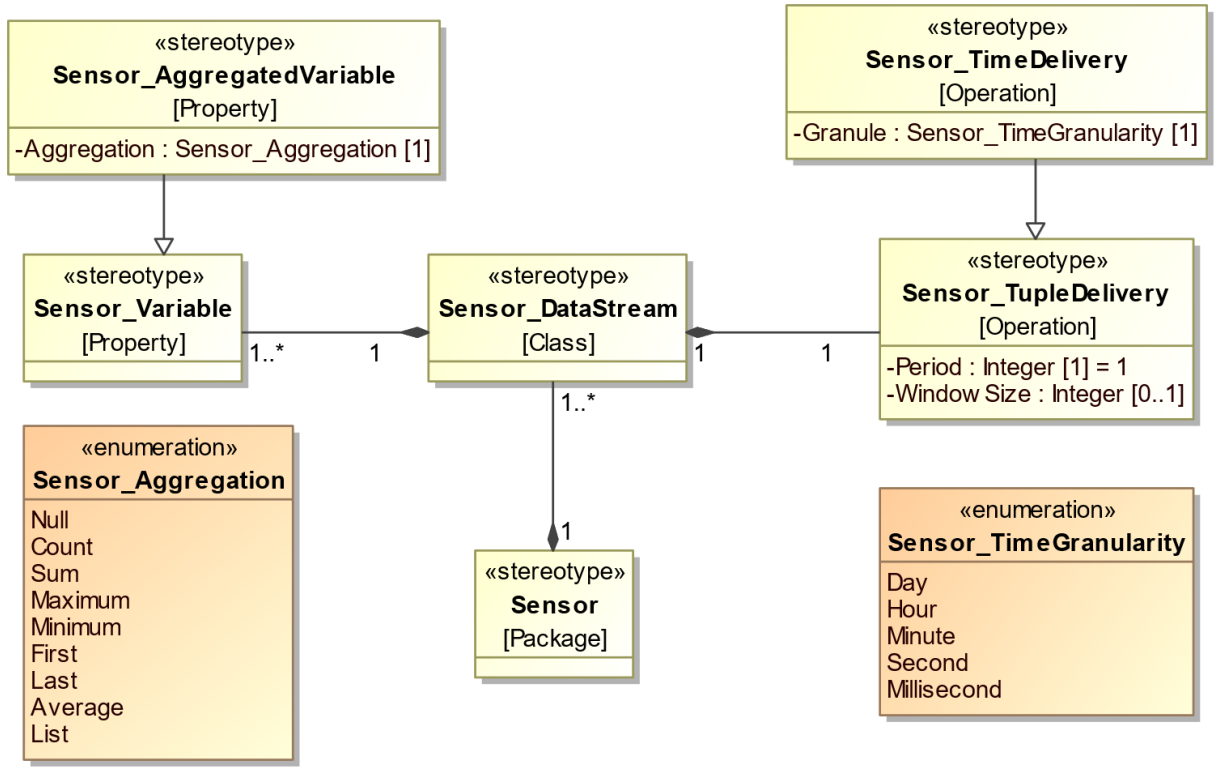
- ✓ Appropriate data only.
- ✓ Required analysis only.
- ✓ Reduced dependence.
- ✓ Faster and easier processes.



(Bimonte et al., 2013; Lennerholt et al., 2018; Saggi and Jain, 2018)



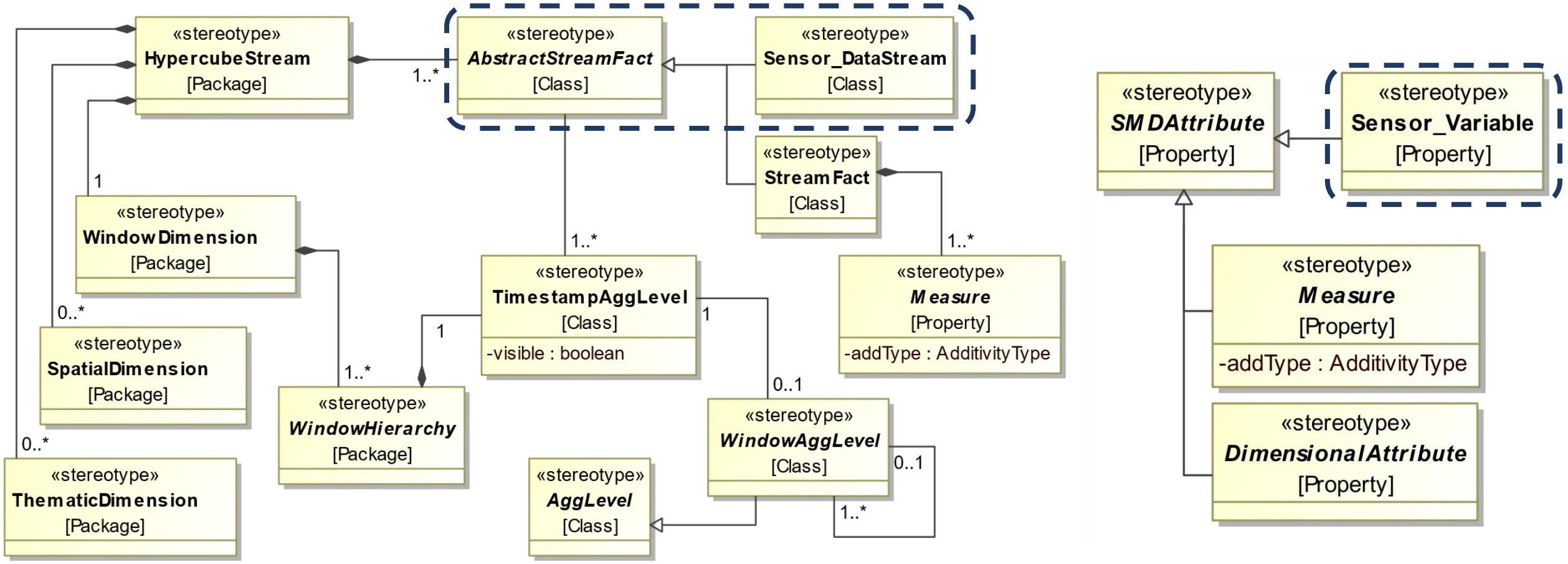
- Design and implementation of active stream data warehouses[1].
- Our UML profile for IoT data:



ProtOLAP: (Bimonte et al., 2013)

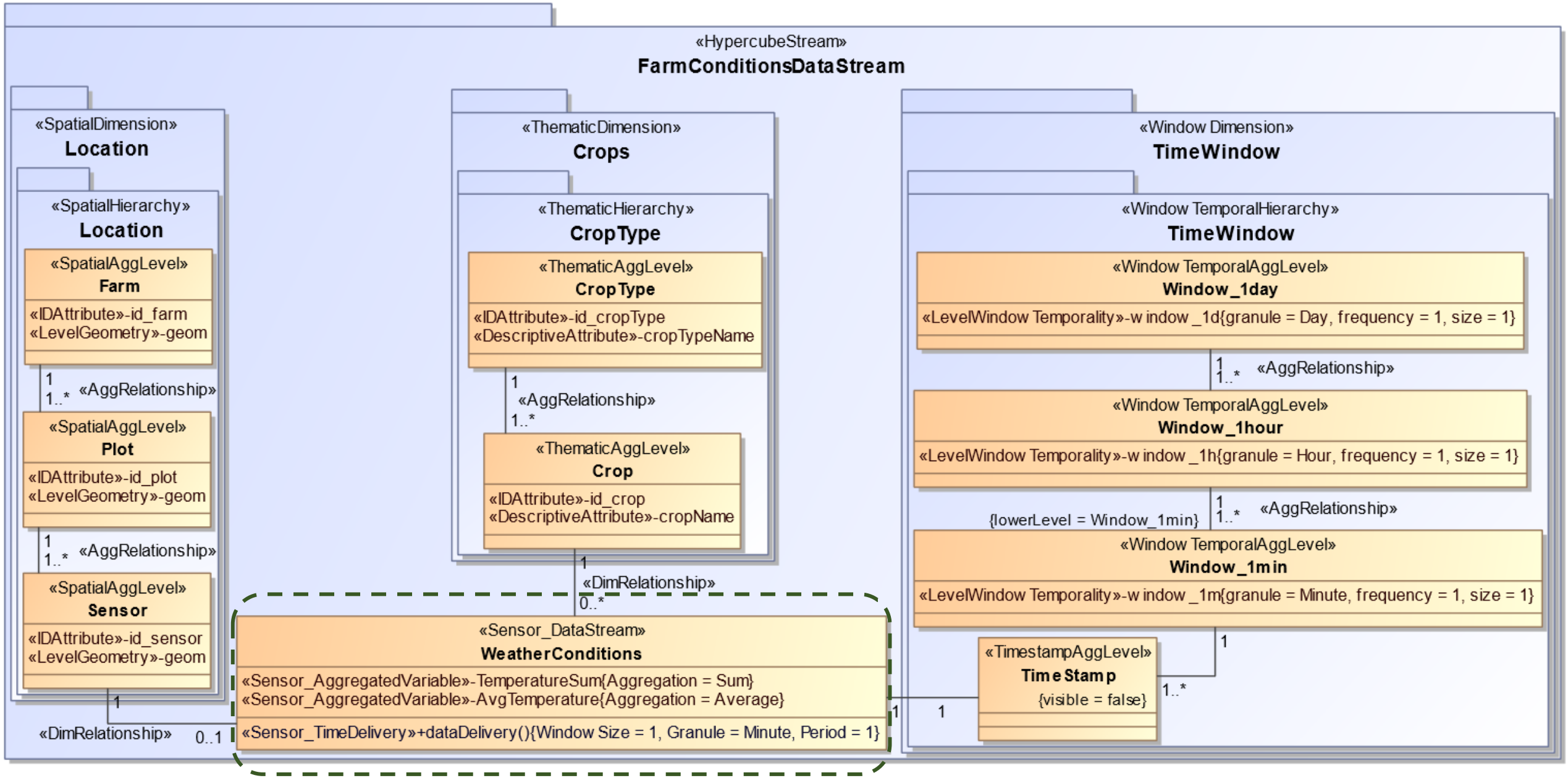
1. (Bimonte et al., 2019)

Conceptual Model



Extension of the Active Stream Data Warehouse profile

(Bimonte et al., 2019)


«HypercubeStream»
FarmConditionsDataStream
«SpatialDimension»
Location
«SpatialHierarchy»
Location
«SpatialAggLevel»
Farm
«IDAttribute»-id_farm
«LevelGeometry»-geom
1
1..*
«AggRelationship»
«SpatialAggLevel»
Plot
«IDAttribute»-id_plot
«LevelGeometry»-geom
1
1..*
«AggRelationship»
«SpatialAggLevel»
Sensor
«IDAttribute»-id_sensor
«LevelGeometry»-geom
1
«DimRelationship»
0..1
«ThematicDimension»
Crops
«ThematicHierarchy»
CropType
«ThematicAggLevel»
CropType
«IDAttribute»-id_cropType
«DescriptiveAttribute»-cropTypeName
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«AggRelationship»
1..*
«ThematicAggLevel»
Crop
«IDAttribute»-id_crop
«DescriptiveAttribute»-cropName
1
«DimRelationship»
0..*
«Sensor_DataStream»
WeatherConditions
«Sensor_AggregatedVariable»-TemperatureSum{Aggregation = Sum}
«Sensor_AggregatedVariable»-AvgTemperature{Aggregation = Average}
«Sensor_TimeDelivery»+dataDelivery(){Window Size = 1, Granule = Minute, Period = 1}
«Window Dimension»
TimeWindow
«Window TemporalHierarchy»
TimeWindow
«Window TemporalAggLevel»
Window_1day
«LevelWindow Temporality»-w indow _1d{granule = Day, frequency = 1, size = 1}
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1..*
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1..*
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Time Stamp
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Bibliography

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