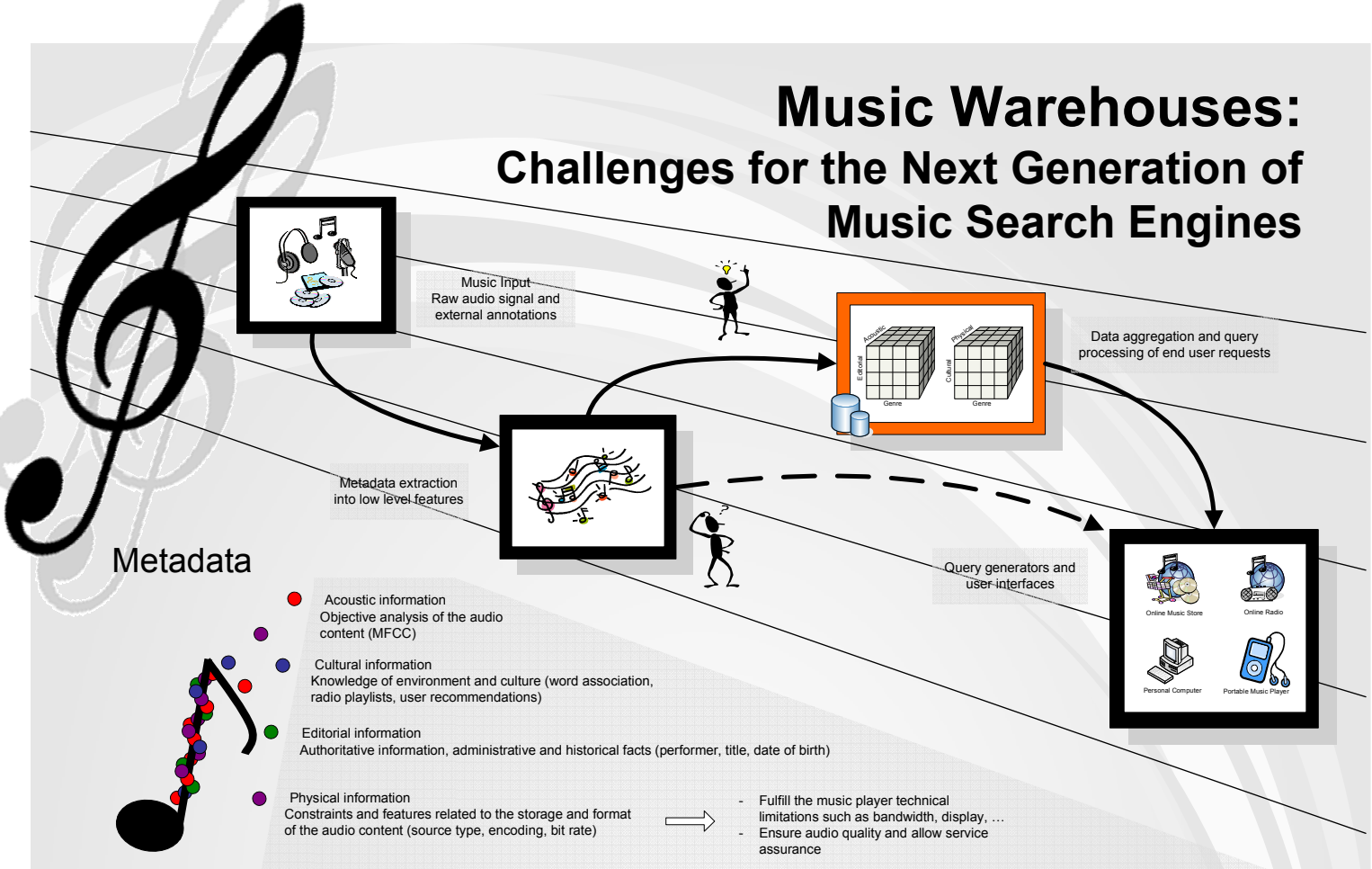
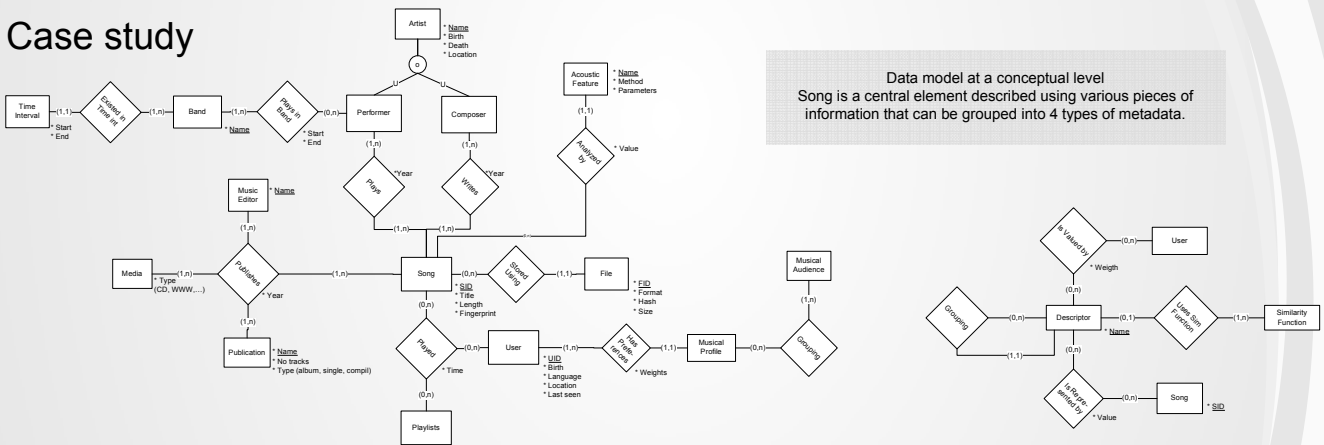


# Music Warehouses: Challenges for the Next Generation of Music Search Engines



## Case study



## Challenges

**Time series**

New aggregation functions on time series  
Sequence operators: cut, add, compare  
Non uniform time intervals

**Precision aware retrieval**

Rough approximations rather than exact answers  
Top-K queries with ranking in subsets  
Results streams returning progressively more precise and reliable information

**Navigation in n-dimensional space**

Data model enriched with multidimensional navigation features  
Notion of neighborhood, intersections, landscape, fuzzy borders  
Primary and secondary itineraries with various lengths to fit the musical taste of the user

**Standards compatibility**

Integration of existing formats such as MP3, OGG, WAV  
MusicXML, Humdrum, Guido  
MPEG7

**Versioned irregular hierarchies**

Music taxonomies are non-strict, non-onto, non covering, dynamic and non-consensual.  
Need for versioning abilities in hierarchies, inspired from software versioning system.

**Aggregates for dimensional reduction**

Reduce dimensionality using fused dimension rather than using projections.  
Ex: Rhythm, pitch, loudness summarized into a fused dimension  
Complexity reduced, essence maintained.

**Data Imperfection**

Source quality information  
Handling of missing and inferred values

**Fuzzy hierarchies**

Hierarchies should handle multiple aggregation path with degree of membership to each parent level.  
Ex: genre dimension

**Integration of new data types**

Provide access to external data such as web site and flash applications.  
Specific extractors enabling analysis.  
Ex: list of concerts

**Many-to-many relationships**

Handled by schema