

**ArtistInfo**



## Motivation & Technical Background

Philipp Ackermann, Metason



# „Long Ago (And Far Away)“

Ira Gershwin/Jerome Kern [1944]

- Vinyl LP covers
  - 32.7 cm square
  - Gatefold covers
  - Sleeves with prints
- Rich content
  - Large cover art
  - Liner notes
  - Artists with photos
  - Song titles
  - Lyrics
  - Composers, musicians, producers, recording studio, sound engineers, ...



# „Silver and Gold“

U2 – Rattle and Hum [1988]

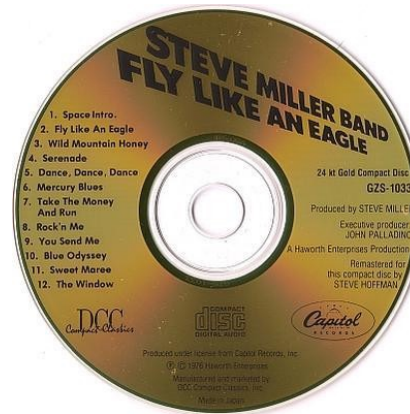
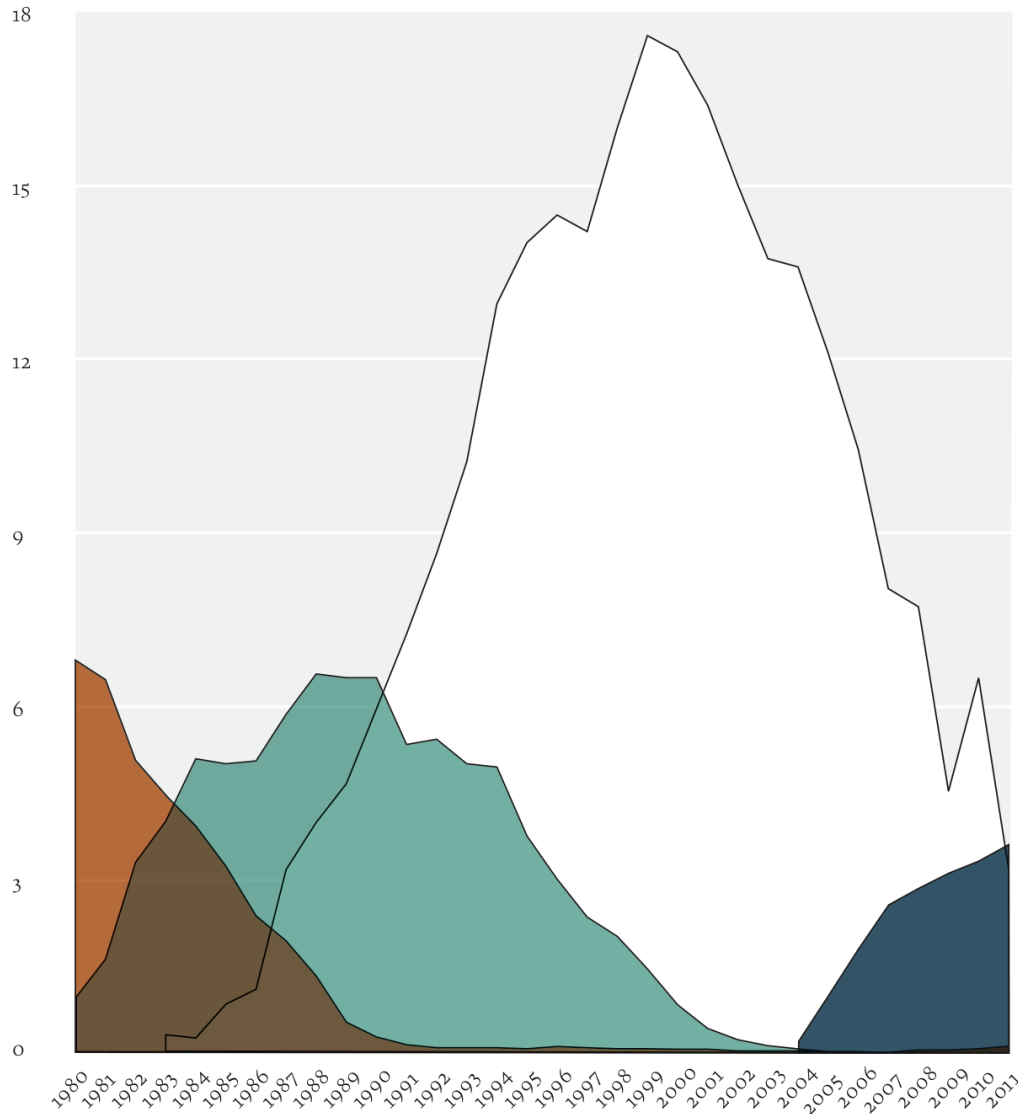
- Compact Disc (CD)
  - The „silver“ disc
- CD covers
  - 11.8 cm x 15 cm
- CD booklets
  - Still rich content,
  - but
    - quite small
    - not handy
- The „golden“ music business



# „Take the Money and Run“

Steve Miller Band – Fly Like an Eagle [1976]

DOLLAR AMOUNTS OF UNITS SHIPPED—  
IN BILLIONS (1980 to 2010)







-  LP/EP/Vinyl single
-  Cassette/Cassette single
-  CD/CD single
-  Download album/single

Diagram from:  
David Byrne – How Music Works [2012]

Yes, the front man of Talking Heads

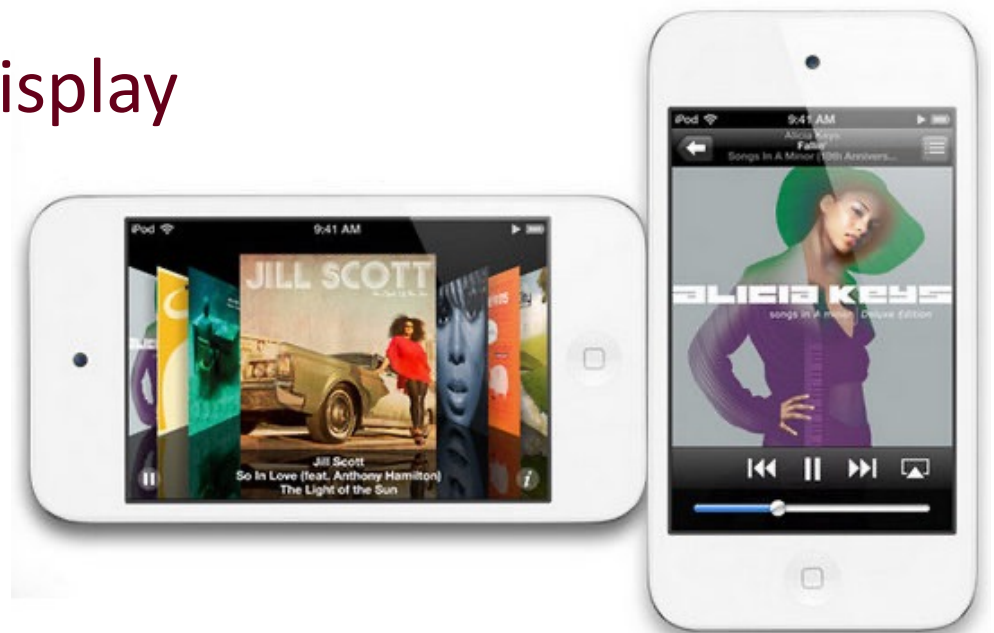




# „Walk on the Wild Side “

Lou Reed – Transformer [1972]

- Become a mobile music listener
  - ... Walkman ... iPod
- MP3 Players /SmartPhones
  - About 5.0 cm x 7.5 cm display
- Little content
  - Small cover art
  - Album artist name
  - Album title & song titles



# „Killing Me Softly“

The Fugees – The Score [1996]

- Space for contextual information disappears



# „Listen to the Music“

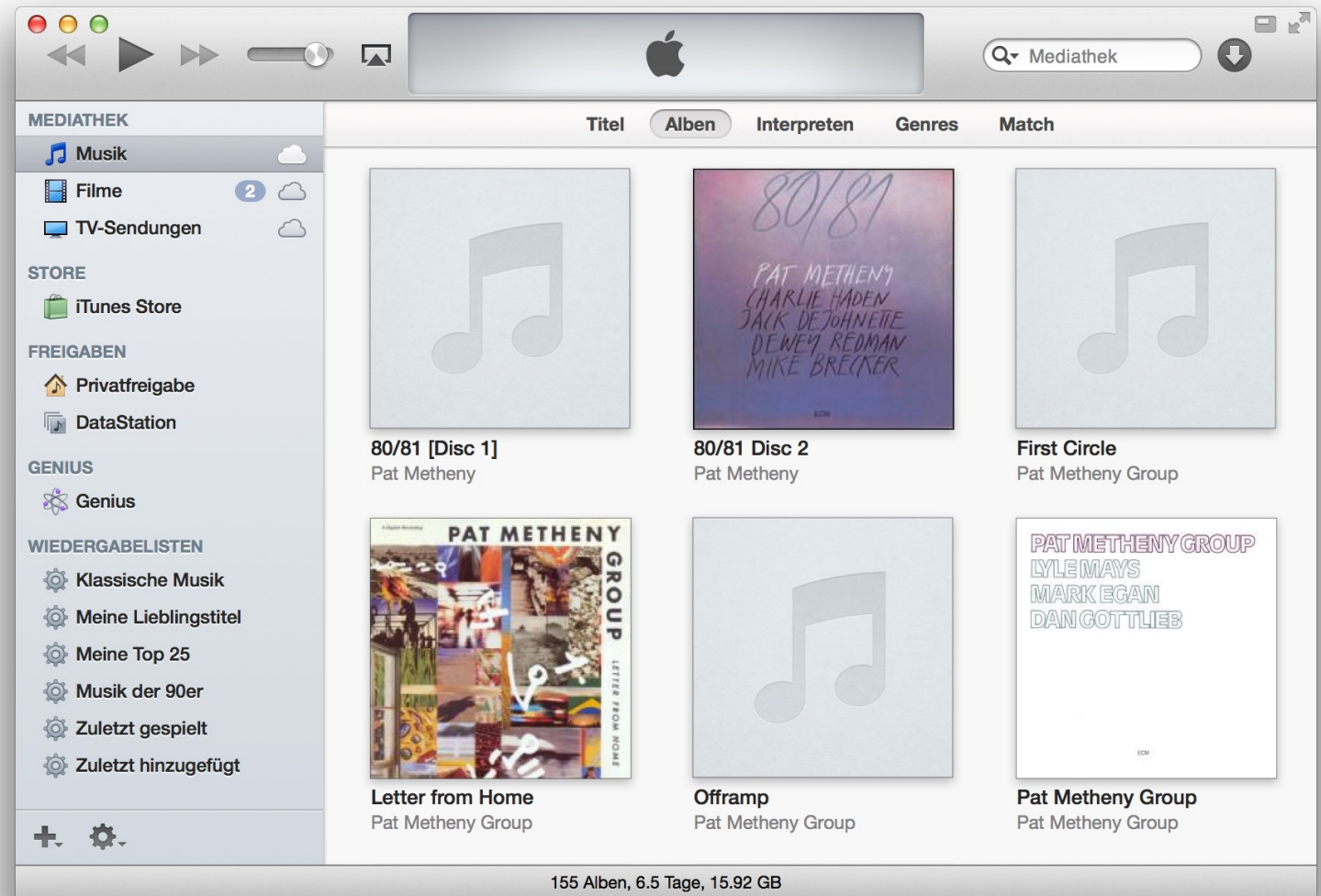
The Doobie Brothers – Toulouse Street [1972]

- Today it's bits and bytes ...
- Digital music collection
- Managed by a media library application
  - e.g., iTunes, Windows Media Player, ...
- Audio data
  - .mp3, .m4a, .wma, .flac, ...
- Meta data
  - Album artist, album title, release year, genre, ...

# „Troubles, Troubles, Troubles“

B.B. King – I Want to Get Married [1957]

- Meta data often not well maintained
  - No cover
  - No data
  - Wrong data
  - Typos
- Still missing
  - Musicians
  - Portrait photos
  - Biography
  - Liner notes
  - „Links“





# „What Do U Want Me 2 Do?“

Prince – Musicology [2004]

- Bring back the background information formerly found on LP covers and in CD booklets
- Connect contextual information about artists
  - Band membership
  - Featured artists on album
  - Performed musical instruments
  - Biography
  - Discography
  - Links to multimedia data on the Internet

# „Fool That I Am“

Etta James – The Second Time Around [1961]

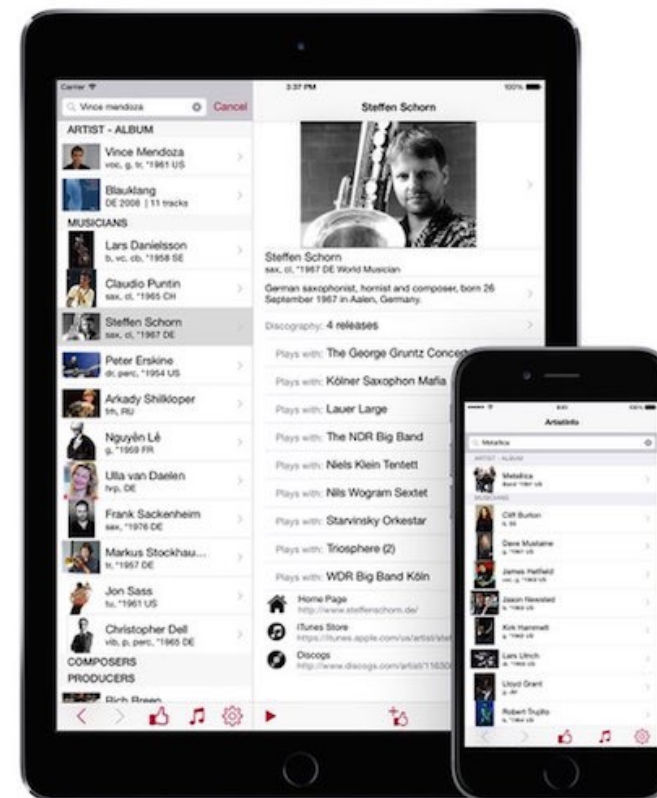
- Project **ArtistInfo**
  - Goal: a Mac OSX app complementing iTunes
  - Started January 2013, using Objective-C & Xcode
- Personal background
  - Music lover / music collector
    - LP collection → CD collection → digital music collection
  - Active musician
    - Double Bass
    - Bass Guitar



# ArtistInfo Apps



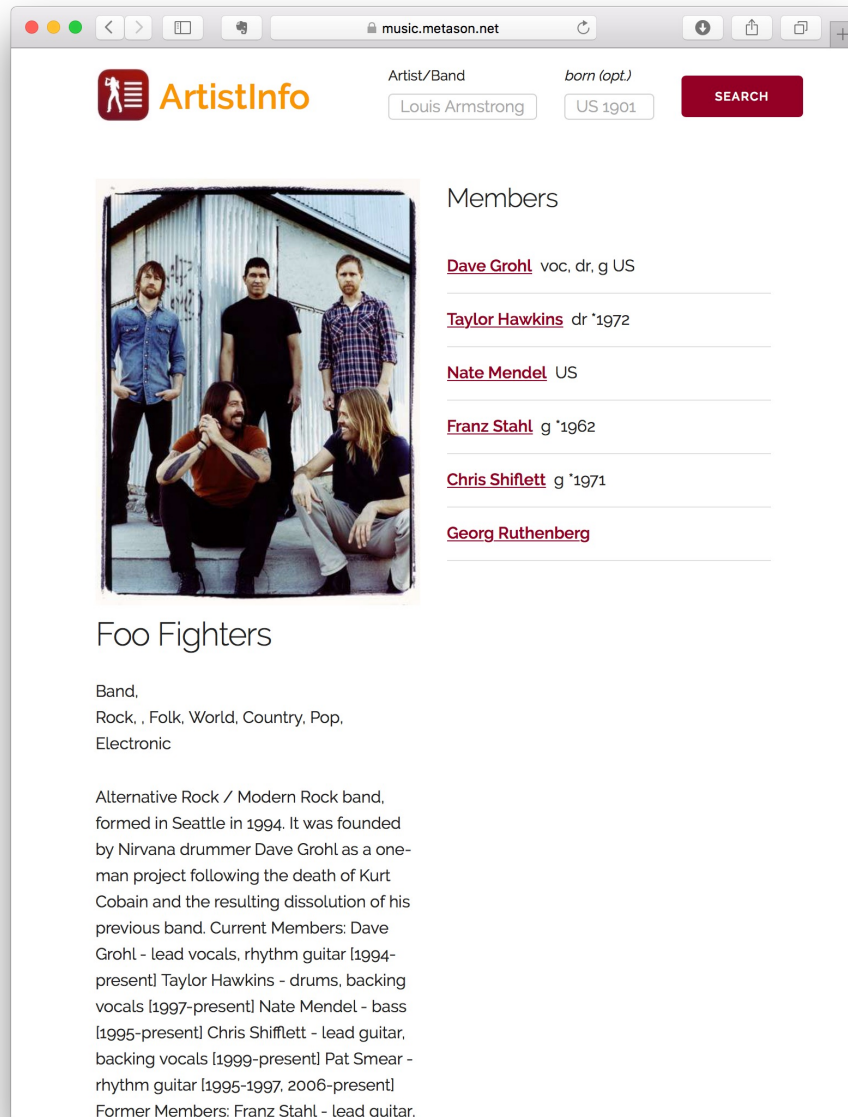
ArtistInfo for Mac



ArtistInfo for iOS




# ArtistInfo for Web



ArtistInfo

Artist/Band *born (opt.)*  
Louis Armstrong US 1901 SEARCH



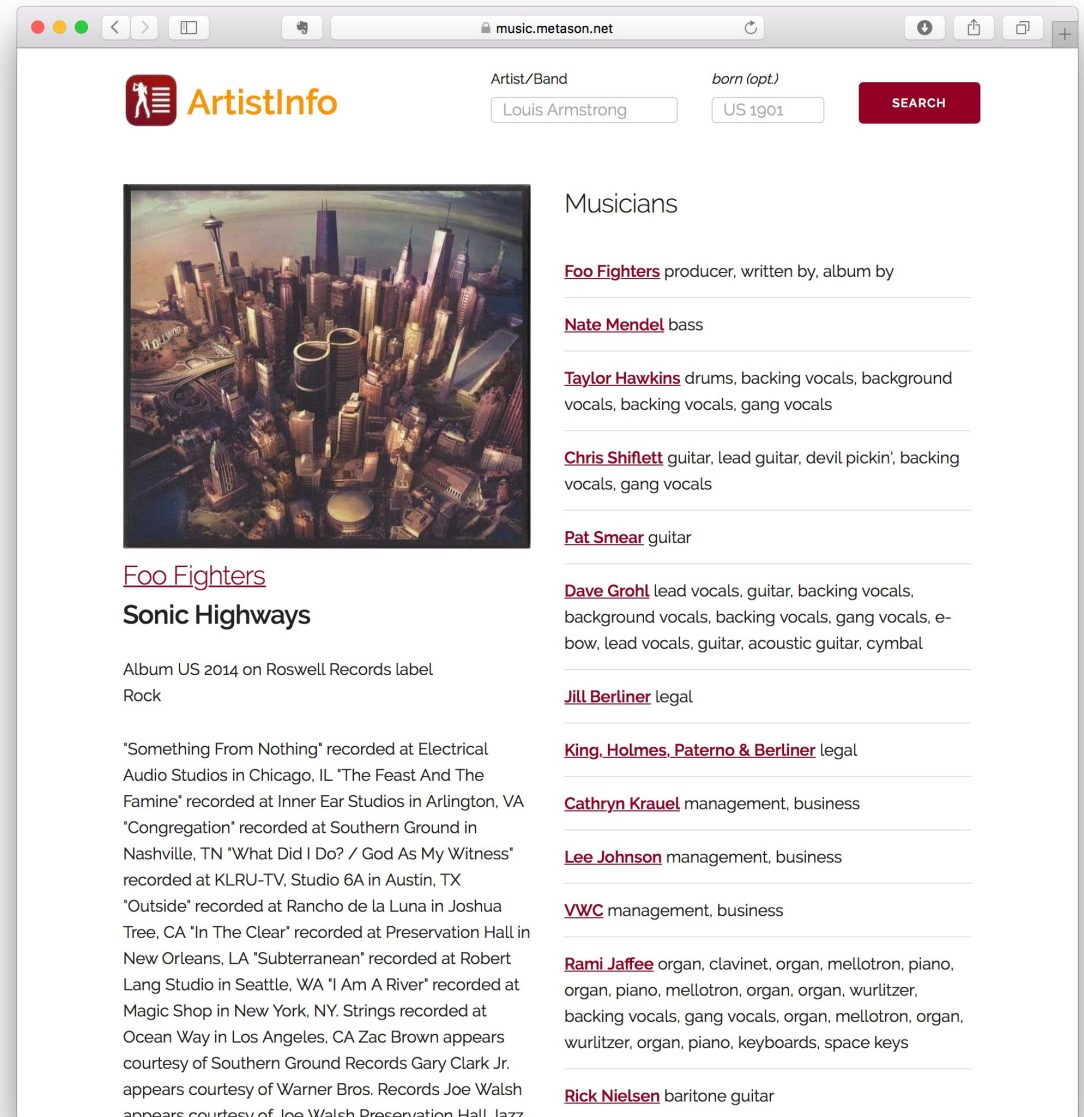
## Members

- [Dave Grohl](#) voc, dr, g US
- [Taylor Hawkins](#) dr \*1972
- [Nate Mendel](#) US
- [Franz Stahl](#) g \*1962
- [Chris Shiflett](#) g \*1971
- [Georg Ruthenberg](#)

## Foo Fighters


Band,  
Rock, , Folk, World, Country, Pop,  
Electronic

Alternative Rock / Modern Rock band, formed in Seattle in 1994. It was founded by Nirvana drummer Dave Grohl as a one-man project following the death of Kurt Cobain and the resulting dissolution of his previous band. Current Members: Dave Grohl - lead vocals, rhythm guitar [1994-present] Taylor Hawkins - drums, backing vocals [1997-present] Nate Mendel - bass [1995-present] Chris Shiflett - lead guitar, backing vocals [1999-present] Pat Smear - rhythm guitar [1995-1997, 2006-present] Former Members: Franz Stahl - lead guitar,



ArtistInfo

Artist/Band *born (opt.)*  
Louis Armstrong US 1901 SEARCH



## Musicians

- [Foo Fighters](#) producer, written by, album by
- [Nate Mendel](#) bass
- [Taylor Hawkins](#) drums, backing vocals, background vocals, backing vocals, gang vocals
- [Chris Shiflett](#) guitar, lead guitar, devil pickin', backing vocals, gang vocals
- [Pat Smear](#) guitar
- [Dave Grohl](#) lead vocals, guitar, backing vocals, background vocals, backing vocals, gang vocals, e-bow, lead vocals, guitar, acoustic guitar, cymbal
- [Jill Berliner](#) legal
- [King, Holmes, Paterno & Berliner](#) legal
- [Cathryn Krauel](#) management, business
- [Lee Johnson](#) management, business
- [VWC](#) management, business
- [Rami Jaffee](#) organ, clavinet, organ, mellotron, piano, organ, piano, mellotron, organ, organ, wurlitzer, backing vocals, gang vocals, organ, mellotron, organ, wurlitzer, organ, piano, keyboards, space keys
- [Rick Nielsen](#) baritone guitar

## Foo Fighters

### Sonic Highways

Album US 2014 on Roswell Records label.  
Rock

"Something From Nothing" recorded at Electrical Audio Studios in Chicago, IL "The Feast And The Famine" recorded at Inner Ear Studios in Arlington, VA "Congregation" recorded at Southern Ground in Nashville, TN "What Did I Do? / God As My Witness" recorded at KLRU-TV, Studio 6A in Austin, TX "Outside" recorded at Rancho de la Luna in Joshua Tree, CA "In The Clear" recorded at Preservation Hall in New Orleans, LA "Subterranean" recorded at Robert Lang Studio in Seattle, WA "I Am A River" recorded at Magic Shop in New York, NY. Strings recorded at Ocean Way in Los Angeles, CA Zac Brown appears courtesy of Southern Ground Records Gary Clark Jr. appears courtesy of Warner Bros. Records Joe Walsh appears courtesy of Joe Walsh Preservation Hall Jazz

<https://music.metason.net>



# ArtistInfo for Mac

- Browse musicians
- Find band members
- Look over famous artists
- Discover artists on albums
- Read artist's biography
- See artist's discography
- Find recommended albums
- View musical instruments
- Explore musical genres
- Pre-listen tracks in iTunes
- View videos on YouTube
- Find upcoming concerts



The screenshot shows the ArtistInfo application window. The search bar at the top contains "Diana Krall - The Look of Love". The left sidebar lists artists and albums, with "Christian McBride" selected. The main content area displays a profile for Christian McBride, including a photo of him playing a double bass, a biography, and a discography table. A pop-up window for the album "Camp Meeting" is also visible.

**Christian McBride**

is: Musician  
born: 1972  
in: United States  
plays: Bass  
plays with: The Jazz Futures Ensemble, Terreon Gully, Charlie Hunter, Eric Krasno, Geoff Keezer

**BIOGRAPHY**

Christian McBride (born May 31, 1972, Philadelphia, Pennsylvania) is an American jazz bassist. His father, Lee Smith, and his great uncle, Howard Cooper, are well known Philadelphia bassists who served as McBride's early mentors. He is regarded as a virtuoso, and is one of the most recorded musicians of his generation, having appeared on over 300 recordings as a sideman. He is also a 3-time Grammy award winner.

**Camp Meeting**

Bruce Hornsby, Christian McBride, Jack DeJohnette  
US 2007  
Legacy  
Album with 11 tracks  
Jazz

Year	Type
2012	Album
2011	Album
2011	Album
2009	Album
2009	Album
2008	Album
2008	Album
2007	Album
2006	Album
2006	Album
2005	Live

# In Sync With iTunes / Apple Music

- Background loading of info for music played in iTunes

The screenshot displays the iTunes interface with the ArtistInfo window open for Kurt Elling's album 'The Gate'. The main window shows the album cover and a track list. The ArtistInfo window provides detailed information about the artist and the album.

**ArtistInfo - Kurt Elling - The Gate**

**ARTIST - ALBUM**

- Kurt Elling, voc, \*1967 US
- The Gate, GB 2011 | 9 tracks

**MUSICIANS**

- Terreon Gully, dr, perc, US
- John McLean, g, GB
- Bob Mintzer, sax, ts, \*1953 US
- Kurt Elling, voc, \*1967 US
- Laurence Hobgood, p, \*1949 US
- John Patitucci, b, \*1959 US
- Kobie Watkins, dr
- Lenny Castro, p, \*1950

**COMPOSERS**

- Seth Present

**PRODUCERS**

- Don Was, voc, p, b, \*1952

**Biography:** Bob Mintzer is a jazz saxophonist, composer, arranger, and big band leader based in Los Angeles, California. Bob Mintzer, born January 27, 1953 and a native of New Rochelle, New York is what's known as a triple threat musician. He is equally active in the areas of performance, composing/arranging, and music education. While touring with the Yellowjackets or his own quartet, or big band, Bob is busy writing music for big band, various small bands, saxophone quartets, orchestral and concert band music. Bob is

**DISCOGRAPHY**

Album Title	Artist	Year	Type
The Body Acoustic	Bob Mintzer, Giovan...	2004	Album
Bop Boy	Bob Mintzer	2002	Album
The Hudson Project	John Abercrombie, P...	2000	Album
Plays The Music Of Duke Ell...	SWR Big Band Feat...	1999	Album
Longing	Bob Mintzer, Gil Gold...	1997	Album
14 Blues & Funk Etudes	Bob Mintzer	1996	Album
Nightline New York	Joachim Kühn, Michael Brecker, Eddie Gomez, Billy Hart, Bob Mintzer, Mark...	1981	Album

**Nightline New York**

Joachim Kühn, Michael Brecker, Eddie Gomez, Billy Hart, Bob Mintzer, Mark...

DE 1981

Sandra Music Productions

Album with 5 tracks

Electro, Jazz

Done Show

source: bob mintzer 1982

Nightline New York Joachim Kühn, Mich... 1981 Album

# In Sync With Spotify

- Background loading of info for music played in Spotify

The screenshot shows the Spotify desktop application interface. At the top, there is a search bar with the text 'Suchen' and a user profile for 'Phillipp Ackerma...'. A notification banner at the top left says 'Willst Du die neueste Version von Spotify installieren? Dann starte Spotify zum Aktualisieren neu.' The main content area displays the album 'The Lost and Found' by Gretchen Parlato, released in 2011, with 15 songs and a total duration of 1 Std. 2 Min. The album cover features Gretchen Parlato. Below the album title, there are controls for 'PAUSE', 'SPEICHERN', and a menu icon. A tracklist is shown with 6 tracks: 1. Holding Back The Years (3:47), 2. Winter Wind (5:30), 3. How We Love (5:25), 4. Juju (6:02), 5. Still (3:04), and 6. Better Than (6:14). The track 'Juju' is currently playing. At the bottom, there is a 'LOVE it.' banner with a 'TRY PREMIUM FREE' button and a progress bar showing 4:32 / 6:01.

The screenshot shows the Spotify ArtistInfo page for Gretchen Parlato. The page title is 'ArtistInfo' and the search bar contains 'Gretchen Parlato - The Lost And Found'. The main content area is divided into several sections: 'ARTIST - ALBUM' showing 'Gretchen Parlato' (voc, perc, \*1976 US) and 'The Lost And Found' (US 2011 | 15 tracks); 'MUSICIANS' listing Derrick Hodge, Robert Glasper, Kendrick Scott, Taylor Eigsti, Alan Hampton, and Dayna Stephens; 'COMPOSERS' listing Mick Hucknall, Neil Moss, Gretchen Parlato, Paulinho Da Viola, Lauryn Hill, Josh Mease, and Miles Davis; 'BIOGRAPHY' providing a detailed description of Gretchen Parlato's career; and 'DISCOGRAPHY' listing her albums and live recordings.

**ARTIST - ALBUM**

- Gretchen Parlato (voc, perc, \*1976 US)
- The Lost And Found (US 2011 | 15 tracks)

**MUSICIANS**

- Derrick Hodge (b, eb, \*1979 US)
- Robert Glasper (p, ep, \*1978 US)
- Kendrick Scott (dr, key, perc, \*1980 US)
- Taylor Eigsti (p, ep, org, \*1984 US)
- Alan Hampton (voc, g)
- Dayna Stephens (sax, ts)

**COMPOSERS**

- Mick Hucknall (voc, \*1960 GB)
- Neil Moss (GB)
- Gretchen Parlato (voc, perc, \*1976 US)
- Paulinho Da Viola (BR)
- Lauryn Hill (voc, \*1975 US)
- Josh Mease
- Miles Davis (tr, 1926-1991 US)

**BIOGRAPHY**

Gretchen Parlato (born 1976) is an American jazz singer. She has performed and recorded with musicians such as Wayne Shorter, Herbie Hancock, Kenny Barron, Esperanza Spalding, Terence Blanchard, Marcus Miller and Lionel Loueke. Parlato's 2009 sophomore release, In a Dream was positively reviewed by NPR, Jazz Times, the Village Voice, and the Boston Globe. Billboard magazine hailed it as "the most alluring jazz vocal album of 2009". Her 2011 release The Lost and Found received over 30 national and

**DISCOGRAPHY**

Album Title	Artist	Year	Type
Live In NYC	Gretchen Parlato	2013	Live
Live in NYC	Gretchen Parlato	2013	Album
Gretchen Parlato: Live in N...	Gretchen Parlato	2013	Live
The Lost And Found	Gretchen Parlato	2011	Album
In A Dream	Gretchen Parlato	2009	Album
That Is You	Gretchen Parlato, S...	2009	Album
Gretchen Parlato	Gretchen Parlato	2005	Album



# Listen to Music

- Playback of found tracks and albums
  - Local iTunes music collection
  - Apple Music streaming
  - Spotify audio streaming
  - Youtube music video





# Animated Artist Presentation on macOS

- Presentation Mode of ArtistInfo for Mac
- Shows animated infos about currently playing song
  - Album artist, musicians, played instruments, ...
- Using AirPlay to beam on TV



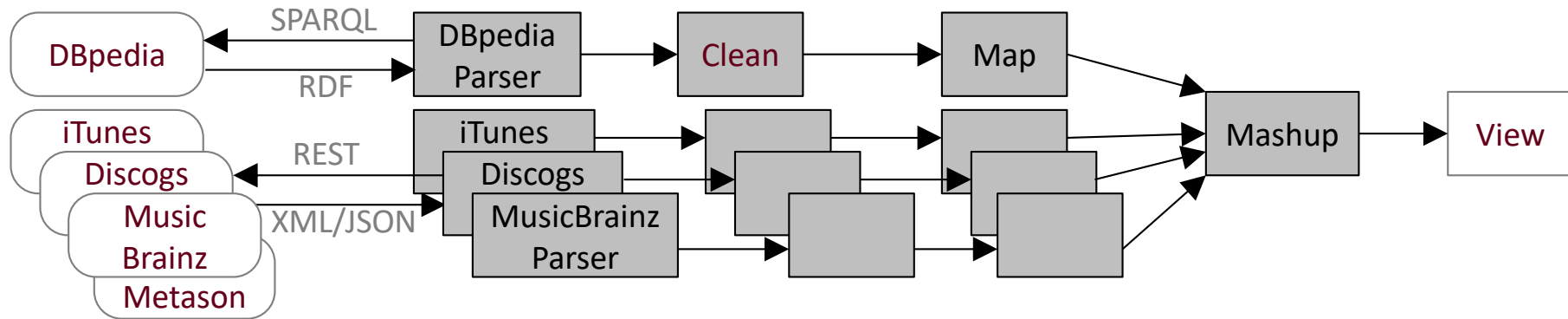
# Data Sources

- Music databases
  - Metason (with data from Discogs)
  - MusicBrainz
  - iTunes Store
  - Access via open APIs using REST calls
- DBpedia
  - Formal data of Wikipedia as Semantic Web
  - Access via SPARQL requests
- Results as XML or JSON data streams



# Processing Pipeline

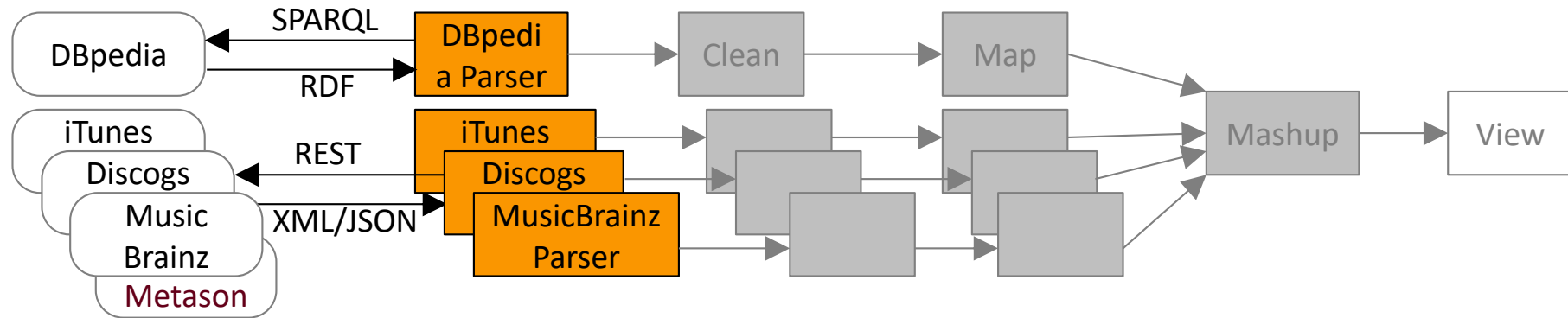
Data Sources → Data Parsing → Data Cleaning & Text Mining → Ontology & Mapping → Mashup → Presentation & Info Vis.



- Multi-stage processing pipeline
  - Fetch → Parse → Clean → Map → Mashup → Present
- Multiple data sources
  - Semantic Web: DBpedia
  - Open Data: Metason (Discogs), MusicBrainz, iTunes Store

# Data Parsing

Data Sources → Data Parsing → Data Cleaning & Text Mining → Ontology Mapping → Mashup → Presentation & Info Vis.



- Send search & access requests to data sources
  - SPARQL query → returns RDF triples
  - REST request → returns XML or JSON data stream
- Extraction of structured data
  - Entities (database entities of source)
  - Attributes: text, number, ID (for direct access without search)
  - URLs: image URL, interlinking URL



# Metason Web Services

- Own database serving
  - Artists: > 2'500'000
  - Albums: > 5'400'000
  - Portrait and cover images
- Metason DB's source is mainly Discogs DB dump
  - Discogs needs OAuth authentication
  - Discogs has daily limit of image downloads
  - Metason Web Service holds subset of Discogs data
  - Metason Web Service caches images
- XAMP Technology: Apache, MySQL, PHP

# In-App DB

- Local index of 250'000 artists
- Uses Realm DB (<https://realm.io>)
- Index used for autocomplete in search
- Local DB feeds iOS Spotlight Search engine

# DBpedia Knowledge Base

- DBpedia
  - Open community project started in 2007
  - Run mainly by Universität Leipzig, Freie Universität Berlin, and OpenLink Software, Inc.
  - Service that extracts structured data from Wikipedia
  - Makes collected data available as a Semantic Web
- English version of DBpedia knowledge base
  - About 3 million classified entries in a consistent ontology
  - About 270 million RDF triples
  - About 830'000 persons (including artists)
  - About 115'000 music albums
  - Entries on music instruments and musical genres

# DBpedia Ontology

- DBpedia ontology
  - Data core based on Resource Description Framework (RDF)
  - RDF triple: subject-predicate-object expression
  - RDF sample: musician-plays-instrument
- Universal Resource Identifier (URI) scheme
  - Resource URI
    - One-to-one mapping to a Wikipedia page  
e.g., `http://dbpedia.org/resource/Beatles`
  - Property URI
    - e.g., `http://dbpedia.org/property/birthdate`
- SPARQL queries
  - Find triples that match graph search pattern



# RDF & SPARQL

- SPARQL sample request

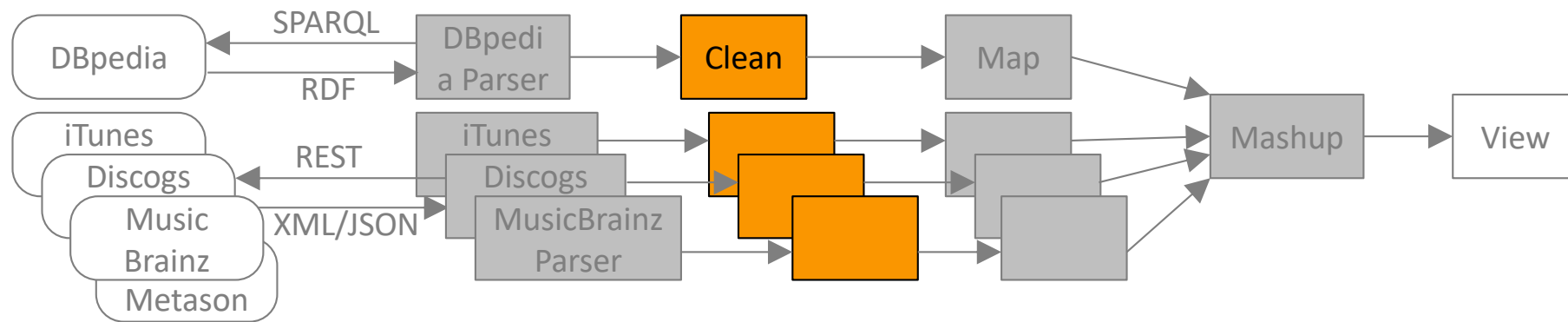
```
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX wiki: <http://dbpedia.org/resource/>
PREFIX wo: <http://dbpedia.org/ontology/>
PREFIX wp: <http://dbpedia.org/property/>
SELECT DISTINCT * WHERE {
    <http://dbpedia.org/resource/Mick\_Jagger>
    wo:instrument ?instr .
    ?instr rdfs:label ?instrName .
    ?instr wo:thumbnail ?thumbURL .
    FILTER langMatches( lang(?instrName), "EN" )
}
```

- SPARQL result

- Found triples that match search pattern
- Resolved variables within graph search pattern

# Data Cleaning & Text Mining

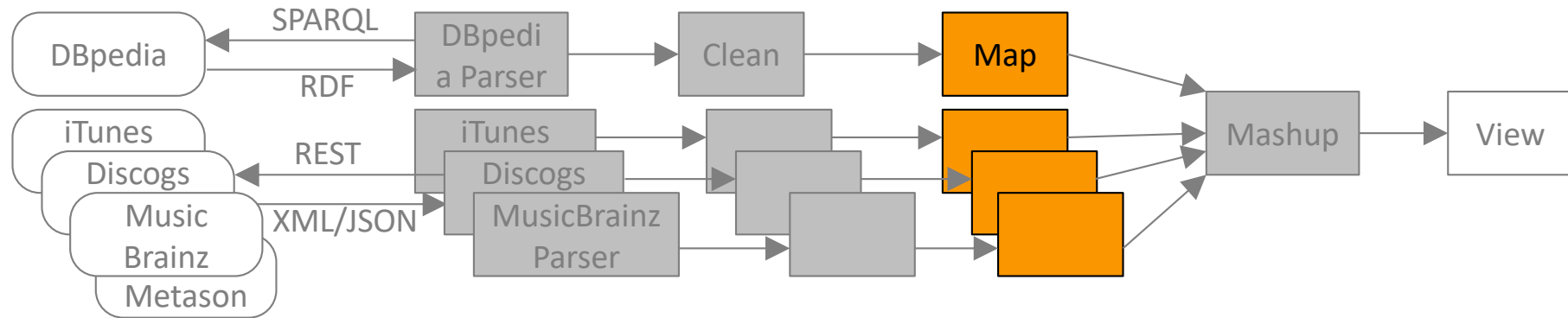
Data Sources → Data Parsing → **Data Cleaning & Text Mining** → Ontology Mapping → Mashup → Presentation & Info Vis.



- **Cleaning of data attributes**
  - Encode as UTF8, trim & eliminate „special“ characters
  - Remove in album title: „CD1“, „Gold Edition“, „({[...])}“
  - Remove in artist name: „({[...])}“
- **Extraction from unstructured data via text mining**
  - Text mining of artist’s biography or description
  - Extracted attributes: instrument, birth year, birth country

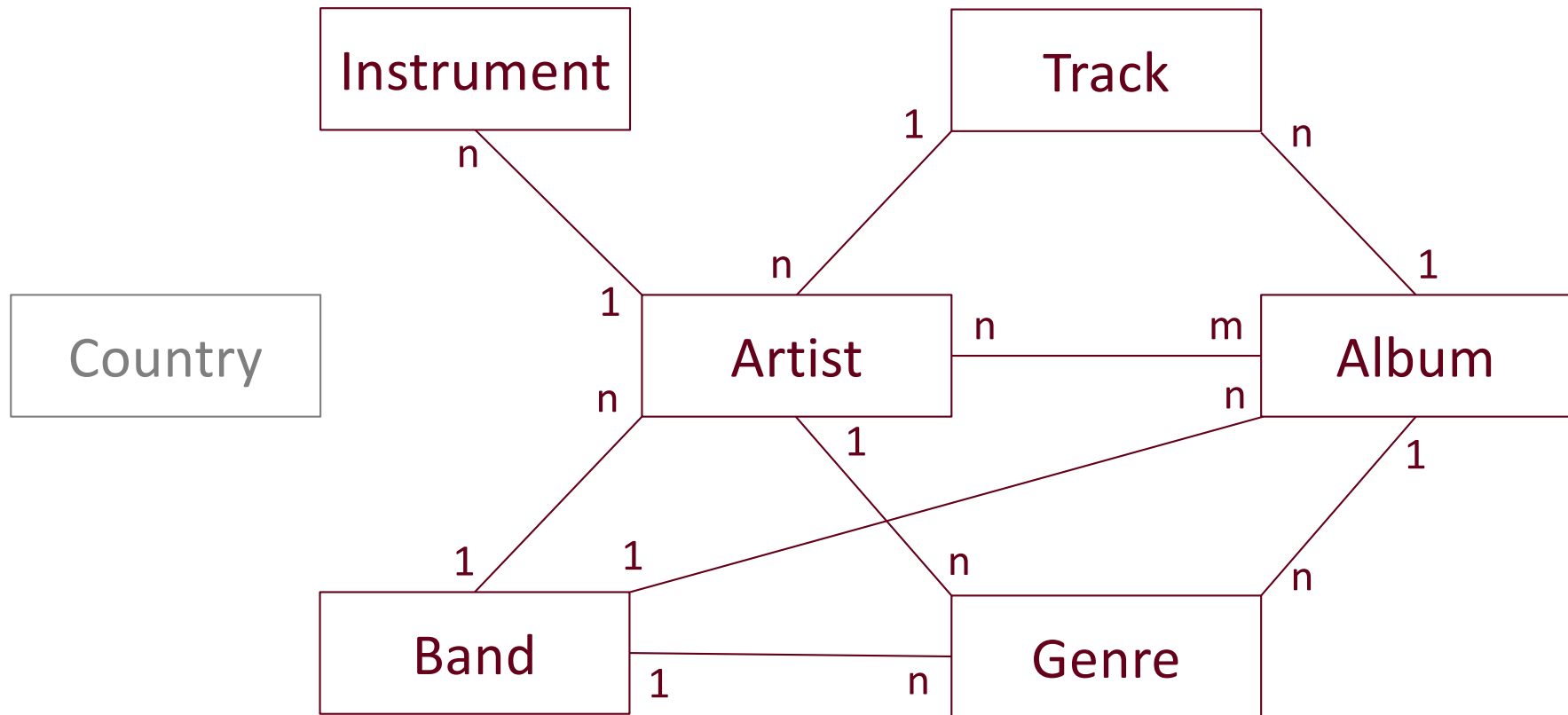
# Ontology Mapping

Data Sources → Data Parsing → Data Cleaning & Text Mining → **Ontology Mapping** → Mashup → Presentation & Info Vis.



- Map entities to Meta Model elements
- Map attributes to predefined classification hierarchies
  - Musical instruments; Musical genres (Genre-Subgenre); Roles; Geographic attributes (Region-Subregion-Country)
- Handle synonyms and abbreviations in classification
  - Naming: Rolling Stones – The Rolling Stones – Rolling Stones, The
  - Synonyms: e.g., double bass, contrabass, upright bass
  - Abbreviations: e.g., GB & GBR for United Kingdom

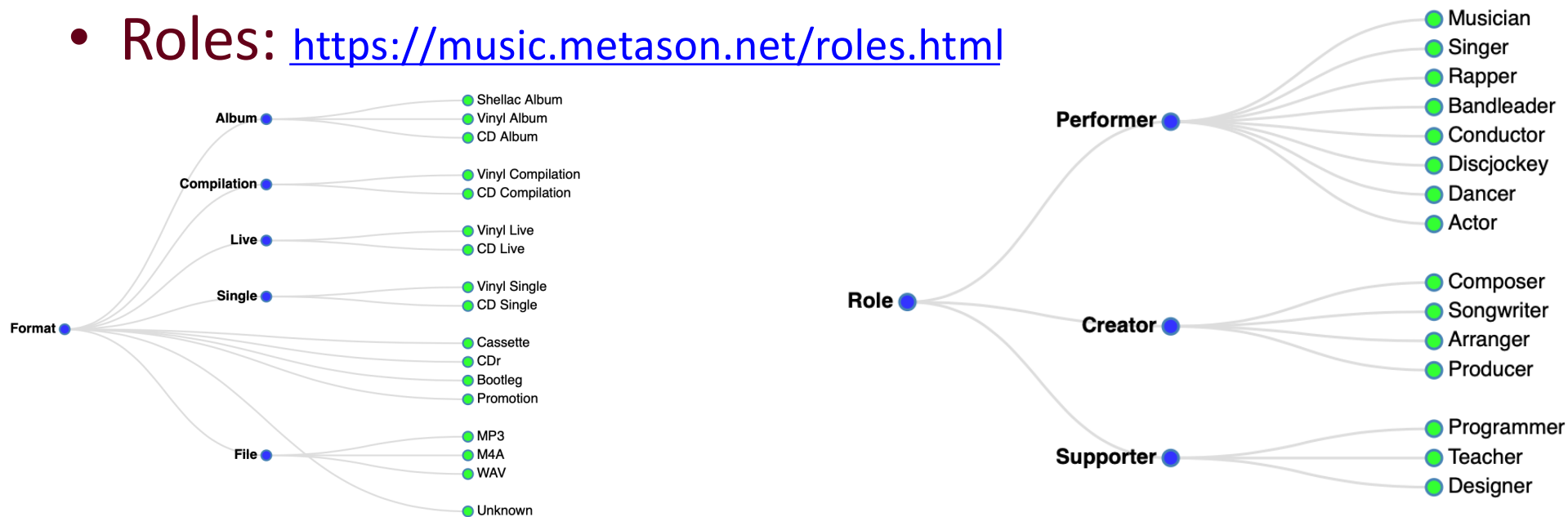
# Meta Model






# Unified Attributes


- Data categories (classification trees) for
  - Genres: <https://music.metason.net/genres.html>
  - Music instruments: <https://music.metason.net/instruments.html>
  - Release formats: <https://music.metason.net/formats.html>
  - Regions: <https://music.metason.net/regions.html>
  - Roles: <https://music.metason.net/roles.html>




# Object-oriented Implementation


**ARTIST - ALBUM**


 Gretchen Parlato  
voc, perc, \*1976 US


 The Lost And Found  
US 2011 | 15 tracks

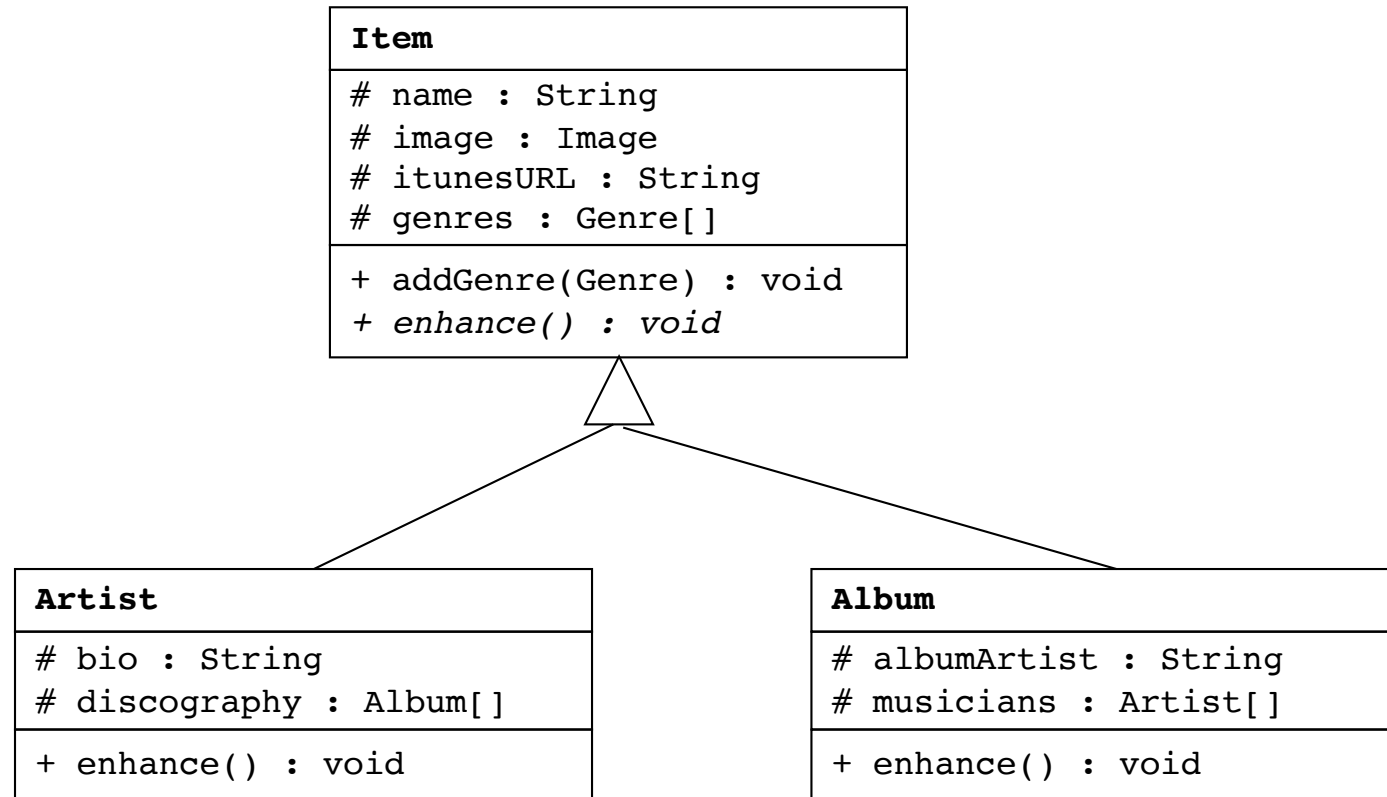
**MUSICIANS**

 Derrick Hodge  
b, eb, \*1979 US

 Robert Glasper  
p, ep, \*1978 US

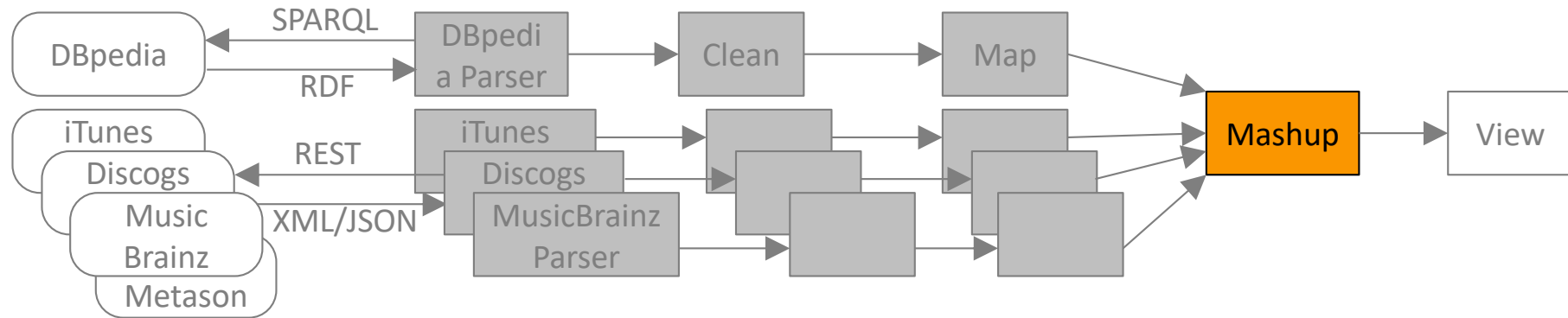
 Kendrick Scott  
dr, key, perc, \*1980 US

 Taylor Eigsti  
p, ep, org, \*1984 US



# Mashup

Data Sources → Data Parsing → Data Cleaning & Text Mining → Ontology Mapping → **Mashup** → Presentation & Info Vis.



- Validate quality of data
- Resolve different releases of same album
  - CD release, Vinyl release, Japan release, Deluxe edition, ...
- Distinguish artists with same name: birth year & country
- Resolve links to images and Web sites (interlinking)
- Merge data to unified model entities

# Media Sources

- ArtistInfo is referencing Web pages and media such as images, audio, and video available on the Web as managed URLs
- Artist-specific Web pages are presented "as is" in an embedded Web browser



WIKIPEDIA  
The Free Encyclopedia

ArtistInfo page for Kenny Wheeler Quintet. The page features a list of musicians including John Taylor, Peter Erskine, Dave Holland, John Abercrombie, Kenny Wheeler, Art Ellerson, Bill Egart, Dave Young, Mary Morell, and Stan Sulzmann. The main content area displays a photograph of a trumpet and a musical staff with notes. Below the staff, it lists related instruments: Trumpet, Saxhorn, Cornet, Bass trumpet, and Flumpet. A detailed description of the flugelhorn is provided at the bottom.

ArtistInfo page for Pat Metheny Trio. The page features a list of musicians including Larry Grenac, Bill Stewart, and Pat Metheny. The main content area displays a photograph of a trumpet and a musical staff with notes. Below the staff, it lists related instruments: Trumpet, Saxhorn, Cornet, Bass trumpet, and Flumpet. A detailed description of the flugelhorn is provided at the bottom.

ArtistInfo page for Marcus Miller. The page features a list of musicians including Gussie Miller, Keb' Mo', Marcus Miller, Jason Thomas, Bobby Sparks, Teddy Campbell, Grégoire Maret, Paul Jackson, Jr., Tom Scott, and Charles "Poogie" Bell. The main content area displays a photograph of a trumpet and a musical staff with notes. Below the staff, it lists related instruments: Trumpet, Saxhorn, Cornet, Bass trumpet, and Flumpet. A detailed description of the flugelhorn is provided at the bottom.





# Data Statistics

- <https://music.metason.net/statistics.html>

**ArtistInfo**

Data Statistics

Content of Metason Database

The information presented in ArtistInfo is collected from open Internet data sources such as Wikipedia, MusicBrainz, and Discogs and is aggregated into the Metason database. It currently contains:

- 2'081'311 Artists
- 472'447 Bands
- 5'426'013 Releases

Data Categories

- Artist **types**
- Artist's **roles**
- Music **instruments**
- Musical **genres** & styles
- World **regions** & countries
- Release **formats**

Releases

The first launched, original version of a musical artwork is stored as release in the Metason database. Additional versions such as country-specific releases, special editions, and reissues (e.g., CD releases of former Vinyl albums) are not part of the database to avoid duplicates.

Artist/Band: Louis Armstrong

born (opt.): US 1901

SEARCH

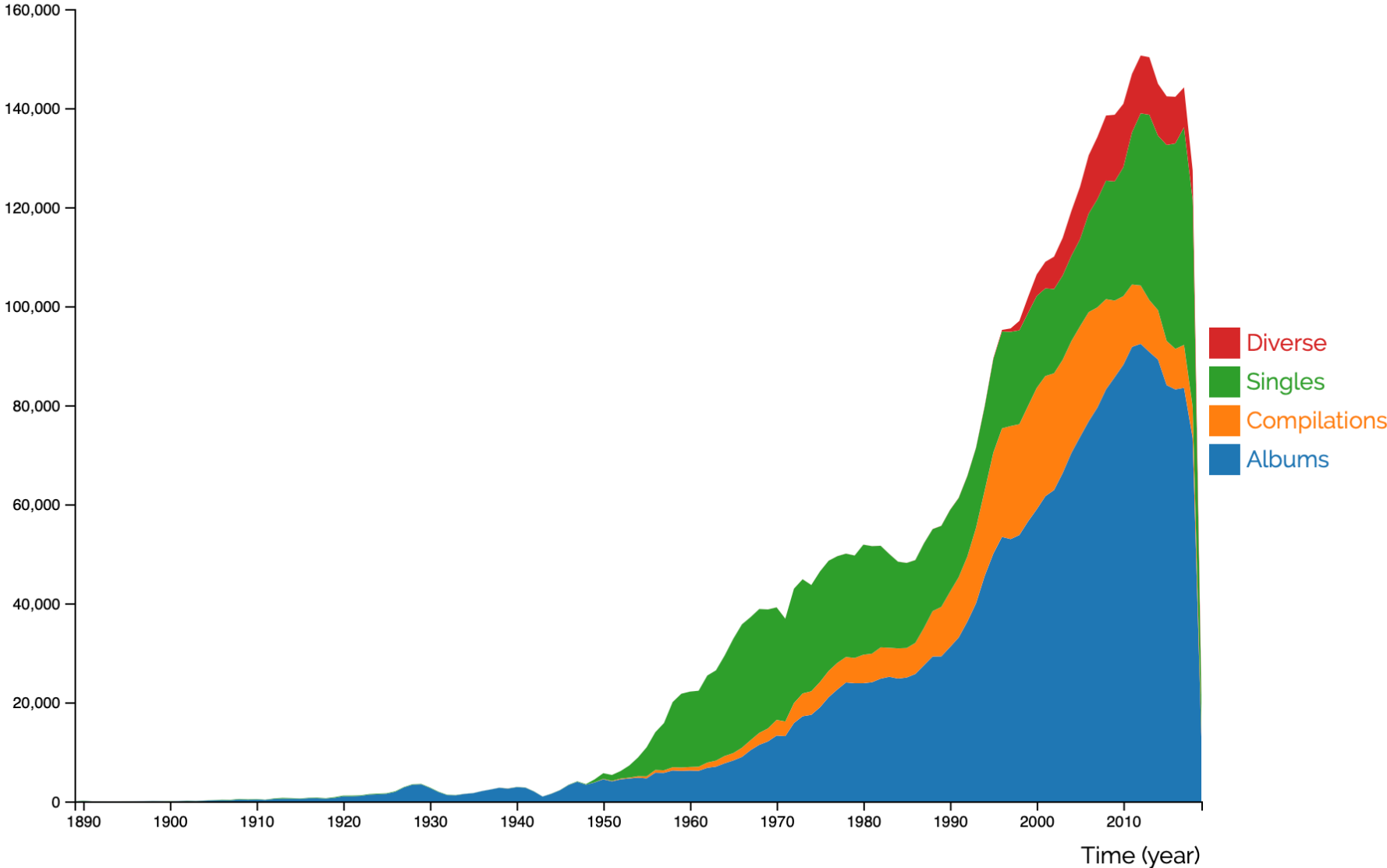
Roles of Artists

Artists can have several roles.

Role	Percentage
Musician	41.71%
Performer	
Singer	
Rapper	
DJ	
Bandleader	
Conductor	
Composer	
Arranger	
Songwriter	
Producer	
Creator	

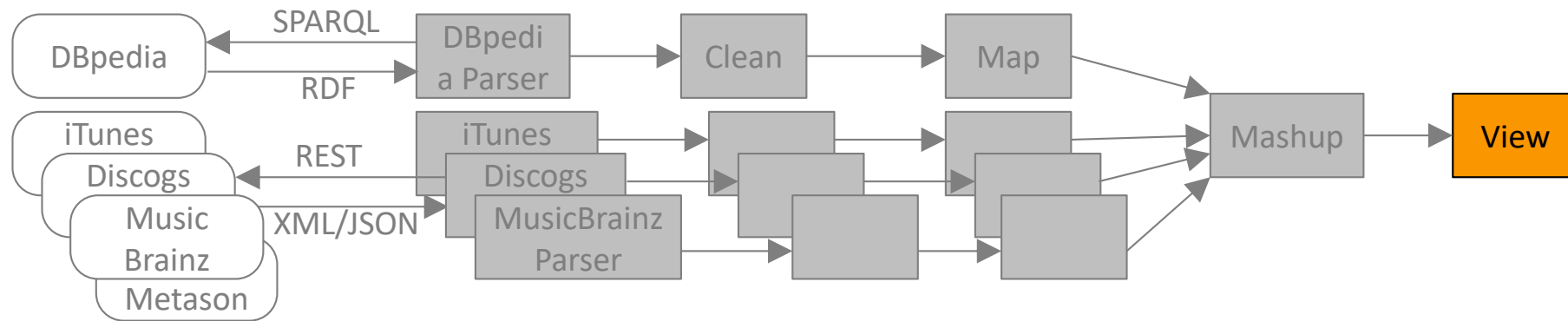
# Data Statistics

# of releases per year



# Presentation & Info Visualisation

Data Sources → Data Parsing → Data Cleaning → Ontology Mapping → Mashup → Presentation & Info Vis.



ArtistInfo Browser

**ArtistInfo - SongVersion**

**India.Arie**  
voc, fl, g, \*1975 US

**SongVersion**  
DE 2013 | 20 tracks

**MUSICIANS**  
India.Arie  
voc, fl, g, \*1975 US  
Gramps Morgan

**COMPOSERS**  
**PRODUCERS**

**India.Arie**  
is: Musician, Singer, Songwriter, Ar...  
born: 1975-10-03  
in: United States  
plays: Vocals  
Flute  
Guitar  
Keyboards  
plays with: Artists For Haiti  
Black Rock Coalition

**BIOGRAPHY**  
India. Arie (born India Arie Simpson; October 3, 1975) is a Grammy Award-winning American singer-songwriter and record producer. She has sold over 3.3 million records in the US and 10 million worldwide. She has won four Grammy Awards from her 21 nominations, including Best R&B Album.

Album Title	Artist	Year	Type
Cocoa Butter	India.Arie	2013	Single
SongVersion	India.Arie	2013	Album
6th Avenue	India.Arie	2012	Single
Testimony, Volume 2: Love & Politics	India.Arie	2009	Album
Chocolate High	India.Arie Feat. Musiq Soul...	2008	Album
Heart Of The Matter	India.Arie	2008	Album
Testimony, Volume 1: Life & Relati...	India.Arie	2006	Album
BET Official Presents	India.Arie	2006	Album
Testimony, Vol. 1, Life & Relationship	India.Arie	2006	Album
There's Hope	India.Arie	2006	Album
I Am Not My Hair	India.Arie	2005	Album
A Time 2 Love	Stevie Wonder	2005	Album
I Remember	Laurneá	2005	Album
Palau De La Música Catalana	Beth	2004	Album
Words & Music: John Mellencamp...	John Mellencamp	2004	Album

ArtistNet Visualisation

**ArtistNet Visualization**

Stop | Circle | Graph | Table | Search

**Album Timeline**  
# albums vs Year (2004-2014)

**India.Arie**  
voc, fl, g, \*1975 US

**ArtistNet**  
Relations among Musicians

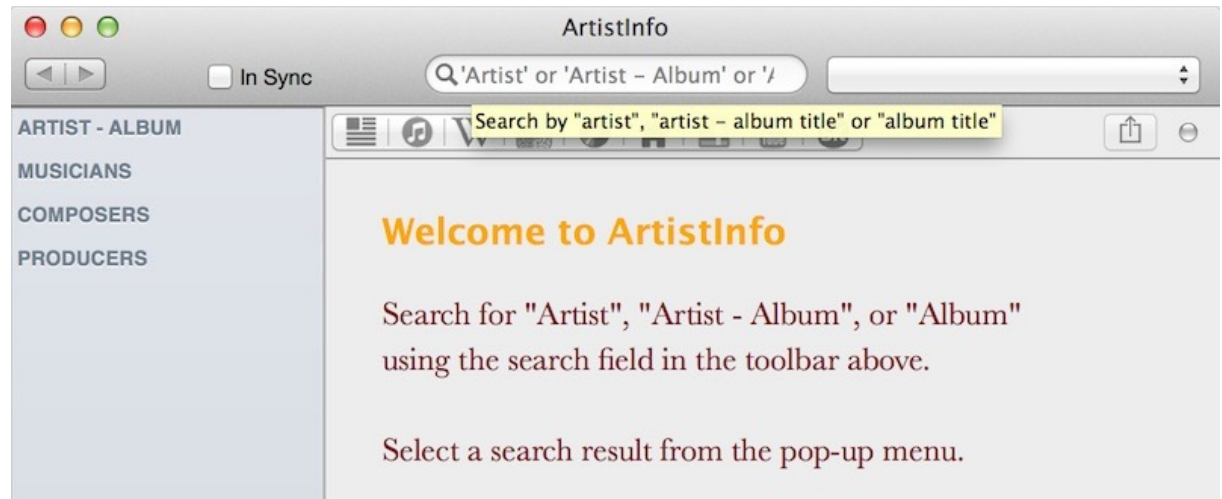
**Graph View**  
display main artist  
show album labels  
show band labels

**ArtistNet: Interactive Graph View**

- Main Artist
- Musicians
- Bands
- Albums

# Search for Artists & Albums

- Search
  - „Artist“
  - „Album“
  - „Artist – Album“
  - Fuzzy search
- Select from search result
- Local index of 300'000 artists within App
- Local index used for autocomplete





# Details on Music Groups

- Band name
- Founding year
- Country
- Band members
- Musical genres
- Band biography
- Discography

**ArtistInfo**

Search: Kings of Leon - Come Around Sund... Kings of Leon - Come Around Sund...

**ARTIST - ALBUM**

- Kings of Leon Band · 1999 US
- Come Around Sundown DE 2010 | 13 tracks

**MUSICIANS**

- Caleb Followill voc, g, US
- Jared Followill b, US
- Matthew Followill g, US
- Nathan Followill dr, US

**COMPOSERS**

**PRODUCERS**

**Kings of Leon**

- is: Music Group
- started: 1999
- in: US
- members: Caleb Followill, Jared Followill, Matthew Followill, Nathan Followill
- genre: Alternative rock, Garage rock

**BIOGRAPHY**

Kings of Leon is an American rock band that originated in Albion, Oklahoma but formed in Nashville, Tennessee in 1999. The band is composed of brothers Anthony Caleb Followill, Ivan Nathan Followill and Michael Jared Followill, with their cousin Cameron Matthew Followill. The group is named for their grandfather Leon from Tahlequah, Oklahoma. The band's early music was an upbeat blend of Southern rock and blues influences, but it has gradually expanded over the years to include a variety of genres and a more alternative, arena rock sound. Kings of Leon achieved initial success in the United Kingdom with a total of nine Top 40 singles, two BRIT

**DISCOGRAPHY**

Album Title	Artist	Year	Type
Come Around Sundown	Kings of Leon	2010	Album
Live at Bonnaroo	Kings of Leon	2010	
Only By the Night (Deluxe Version)	Kings of Leon	2010	Single
DJ Schmollie	Kings of Leon	2010	Album
...	Kings of Leon	2009	
...	Kings of Leon	2009	Single
...	Kings of Leon	2009	EP
...	Blakfish	2009	Single
...	MashUp Germany	2009	Album
...	Kings of Leon	2008	Single
...	Kings of Leon	2008	Album
...	Kings of Leon	2008	Single
...	Kings of Leon	2008	
...	Kings of Leon	2008	Album
...	Kings of Leon	2007	Single
...	Kings of Leon	2007	Album

**Only By the Night (Deluxe Version)**

Kings of Leon

USA 2008  
RCA Records, a unit of SONY BMG MUSIC  
Album with 14 tracks  
Alternative

Done Show

# Details on Albums

- Album cover
- Release year
- Country
- Label
- Genre
- Liner notes
- Musicians
- Song titles
- Artists on song

The screenshot shows a music application window titled "ArtistInfo" with a search bar containing "Adele - 19". The window displays the album cover for "19" by Adele, released in 2008. The interface includes a sidebar with artist and musician information, a main content area with liner notes and a tracklist, and a pop-up window showing musician credits for the song "My Same".

**ARTIST - ALBUM**

- Adele  
voc, g, p, \*1988 GB
- 19  
JP 2008 | 15 tracks

**MUSICIANS**

- Adele  
voc, g, p, \*1988 GB
- Jack Peñate  
voc, g, \*1984 GB
- The Life Gospel Choir  
Band
- Perry Montague-Mason  
vn, GB
- The London Studio Orchestra  
Band GB
- Michael Tighe  
voc, g,
- Pete Biggins
- Matt Allchin
- Stuart Zender  
b, eb, \*1974 GB
- Sam Koppelman
- Jason Silver  
\*1969
- Wired Strings  
Band CH
- Ben Thomas  
GB

**19**

is: Album  
by: Adele  
released: 2008  
in: JP  
on label: XL Recordings  
genre: Pop

**COMMENTS / LINER NOTES**

19 is the debut album by English singer-songwriter Adele. It was released on 28 January 2008, the week after lead single, "Chasing Pavements", was physically released. It debuted at number one on the UK charts on its week. Included is a cover of the Bob Dylan song "Make You Feel My Love". In 2009, "Chasing Pavements" won the Grammy Award for Best Female Pop Vocal Performance, and was nominated for the Grammy Award for Record of the Year and Grammy Award for Best New Artist. Adele also won the Grammy Award for Best New Artist. The track from the album, "Hometown Glory", was nominated for the Grammy Award for Best New Artist. Adele's mother tried to persuade her to leave her home town of West London.

**TRACKS**

#	Title	Artist
1	Daydreamer	Adele
2	Best for Last	Adele
3	Chasing Pavements	Adele
4	Cold Shoulder	Adele
5	Crazy for You	Adele
6	Melt My Heart to Stone	Adele
7	First Love	Adele
8	Right as Rain	Adele
9	Make You Feel My Love	Adele
10	My Same	Adele
11	Tired	Adele
12	Hometown Glory	Adele
13	Painting Pictures	Adele

**My Same**

- Seb Roachford: drums
- Ben Thomas: guitar
- Tom Driessler: bass
- Adele: guitar

Done

# Details on Artists

- Musicians, composers, & producers
- Name
- Birth date
- Country
- Instruments
- Memberships
- Biography
- Discography

**ArtistInfo**

Search:  |

**ARTIST - ALBUM**

Kenny Wheeler Quintet Band

**MUSICIANS**

- John Taylor  
p, key, \*1942 GB
- Peter Erskine  
dr, perc, \*1954 USA
- Dave Holland  
vc, eb, cb, \*1946 GBR
- John Abercrombie  
g, \*1944 USA
- Kenny Wheeler**  
tr, fh, \*1930 CA
- Art Ellefson  
g, sax, GB
- Bill Elgart  
dr, US
- Dave Young  
voc, g, key,
- Marty Morell  
dr, US
- Stan Sulzmann  
sax, GB

**COMPOSERS**

**PRODUCERS**

**Kenny Wheeler**

is: Musician, Composer  
born: 1930-01-14  
in: CA  
plays: Trumpet  
Flugelhorn  
plays with: United Jazz + Rock Ensemble

**Flugelhorn**

The flugelhorn is a brass instrument that resembles a trumpet but has a wider, conical bore. Some consider it a member of the saxhorn family developed by Adolphe Sax (who also developed the saxophone). Other historians assert that it derives from...

**BIOGRAPHY**

Kenneth Vincent John Wheeler is a composer and trumpet and flugelhorn player. His output is rooted in jazz, but he has also contributed to rock music recordings. He is a skilled arranger for small ensembles and is the patron of the...

**DISCOGRAPHY**

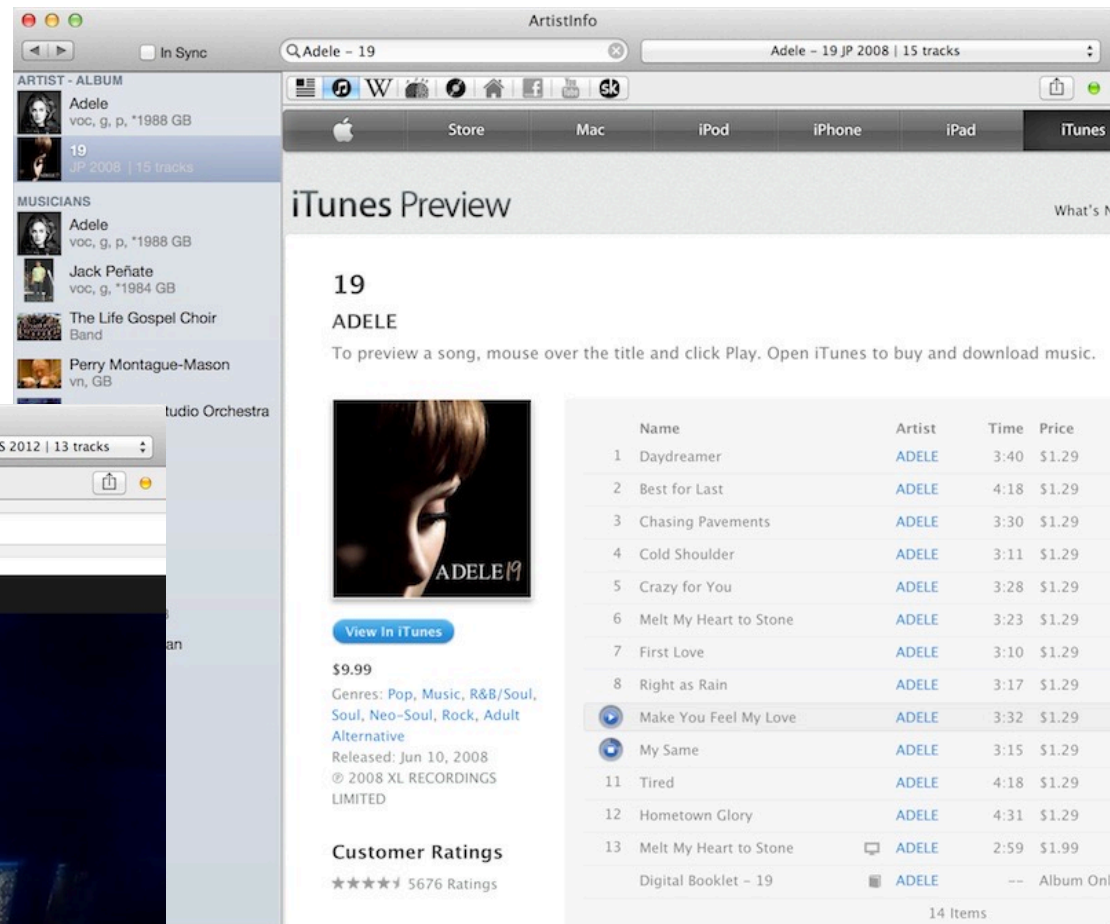
Album Title	Artist	Year	Type
One of Many	Kenny Wheeler, John Taylor & S...	2011	
It Takes Two!	Kenny Wheeler	2006	
What Now? (With Chris Potter, Da...	Kenny Wheeler	2006	Album
Brand New	Marc Copland, John Abercrombi...	2005	Album
What Now?	Kenny Wheeler	2005	
Joana'S Waltz	Wunsch / Strauch Sextet feat. K...	2005	Album
Other People	Kenny Wheeler / Hugo Wolf Stri...	2005	Album
Song For Kenny	Kenny Wheeler	2005	Album
Where Do We Go From Here?	Kenny Wheeler & John Taylor	2004	Album
Free Zone Appleby 2003	Tony Coe, John Edwards, Alan...	2004	Album
Dream Sequence	Kenny Wheeler	2003	Album





# Links to External Multimedia Content

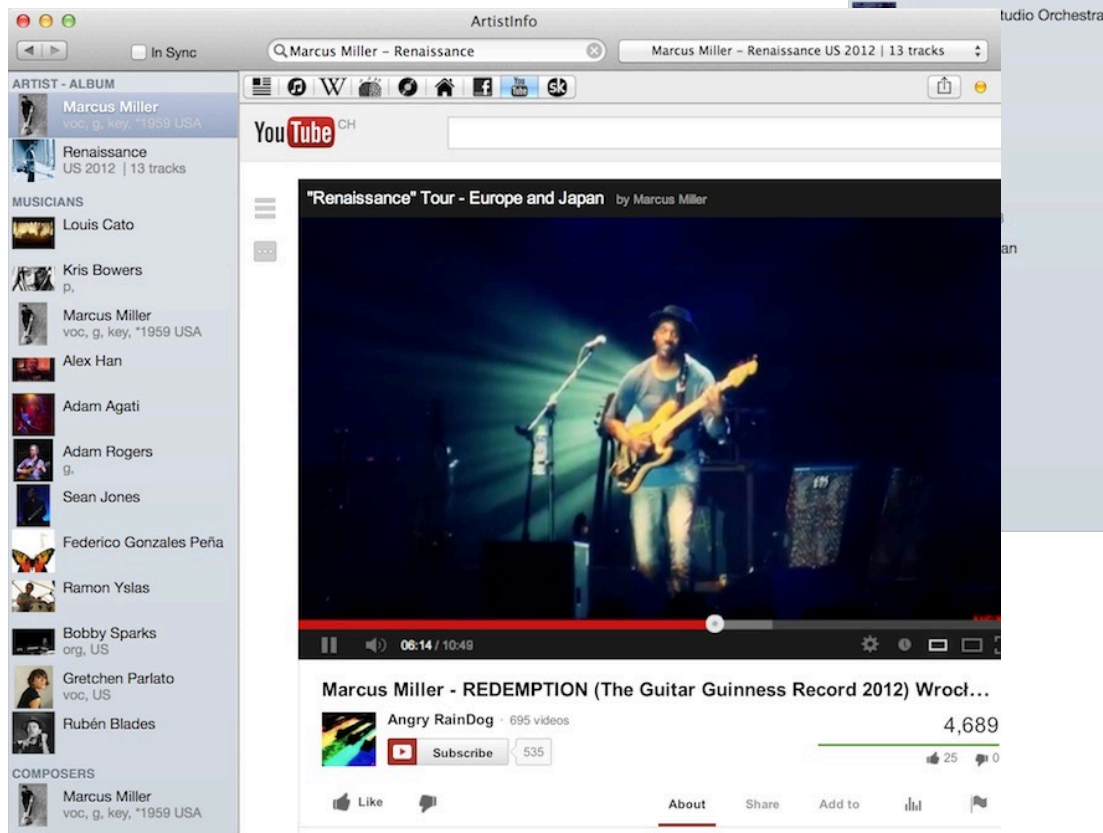
- Pre-listen & buy songs in iTunes Store
- View YouTube videos



The screenshot shows the iTunes Store interface for the album '19' by Adele. The album cover is displayed on the left, and the track list is on the right. The price is \$9.99. The tracks are:

Name	Artist	Time	Price
1 Daydreamer	ADELE	3:40	\$1.29
2 Best for Last	ADELE	4:18	\$1.29
3 Chasing Pavements	ADELE	3:30	\$1.29
4 Cold Shoulder	ADELE	3:11	\$1.29
5 Crazy for You	ADELE	3:28	\$1.29
6 Melt My Heart to Stone	ADELE	3:23	\$1.29
7 First Love	ADELE	3:10	\$1.29
8 Right as Rain	ADELE	3:17	\$1.29
9 Make You Feel My Love	ADELE	3:32	\$1.29
10 My Same	ADELE	3:15	\$1.29
11 Tired	ADELE	4:18	\$1.29
12 Hometown Glory	ADELE	4:31	\$1.29
13 Melt My Heart to Stone	ADELE	2:59	\$1.99
Digital Booklet - 19	ADELE	--	Album Only

Customer Ratings: ★★★★★ 5676 Ratings



The screenshot shows a YouTube video player for the video 'Renaissance" Tour - Europe and Japan' by Marcus Miller. The video is currently playing at 06:14 / 10:49. The video title is 'Marcus Miller - REDEMPTION (The Guitar Guinness Record 2012) Wrocl...'. The video has 4,689 views and 535 subscribers. The video player includes a progress bar, volume control, and a 'Like' button.



# Recommendations

- Top 10 with covers
- Famous artists
- Well-reviewed albums
- Filter by
  - Genre
  - Release year
- Sort by
  - Name
  - Score
- Select for getting details in main view

The screenshot shows a web application titled "ArtistInfo's Recommendations". The main header features a logo of a person with a list icon and the word "Recommendations". Below this, there are five album covers with their respective titles and artists: "Meet Me Around Midnight" by Ida Sand, "Canta Brasil" by Kenny Barron, "The Imagine Project" by Herbie Hancock, "Funk For Life" by Nils Landgren Funk Unit, and "Nights on Earth" by Vince Mendoza. Below the covers, there are two filter sections: "FAMOUS ARTISTS" with a dropdown menu set to "R&B/Soul" and a list of artists with their genres, and "WELL-REVIEWED ALBUMS" with a dropdown menu set to "Jazz" and a date range of "2000 - 2009". The "WELL-REVIEWED ALBUMS" section contains a table of albums with columns for Artist, Album Title, a star rating, Genre, and Released date. At the bottom, it shows "212 of 2474 artists" and "112 of 1691 albums". The MetaSon logo is in the bottom right corner.

**Recommendations**

Meet Me Around Midnight  
Ida Sand

Canta Brasil  
Kenny Barron

The Imagine Project  
Herbie Hancock

Funk For Life  
Nils Landgren Funk Unit

Nights on Earth  
Vince Mendoza

FAMOUS ARTISTS R&B/Soul

Artist	Genre
Bill Withers	R&B, Funk
Billy Preston	R&B, Funk
Billy Ward & the...	R&B
Blackbyrds	R&B, Funk
Bloodstone	R&B, Funk
Bo Diddley	R&B
Bobby "Blue" Bland	R&B
Bobby Byrd	R&B, Funk
Bobby Womack	R&B, Funk
Bohannon/Hamilt...	R&B, Funk
Booker T. & The...	R&B, Funk
Bootsy Collins/B...	R&B, Funk
Boyz II Men	R&B
Brand New Heavies	R&B, Funk

WELL-REVIEWED ALBUMS Jazz 2000 - 2009

Artist	Album Title	★	Genre	Released
Pat Metheny Group	The Way Up	9.8	Jazz	2005
E.S.T.	Seven Days of Falling	9.8	Jazz	2003
The Bad Plus	These Are the Vistas	9.8	Jazz	2003
Madeleine Peyroux	Careless Love	9.8	Jazz	2004
Diana Krall	The Girl in the Other Room	9.7	Jazz	2004
Herbie Hancock	River: The Joni Letters	9.7	Jazz	2007
Ornette Coleman	Sound Grammar	9.7	Jazz	2006
Contemporary Nois...	Pig Inside the Gentleman	9.7	Jazz	2007
Brad Mehldau Trio	Day is Done	9.6	Jazz	2005
Dave Holland Quintet	Extended Play: Live at Bi...	9.6	Jazz	2003
Tomasz Stanko Qu...	Suspended Night	9.6	Jazz	2004
Tord Gustavsen Trio	Being There	9.6	Jazz	2007
Michael Brecker	Pilgrimage	9.5	Jazz	2007
Esperanza Spalding	Esperanza	9.5	Jazz	2008

212 of 2474 artists 112 of 1691 albums

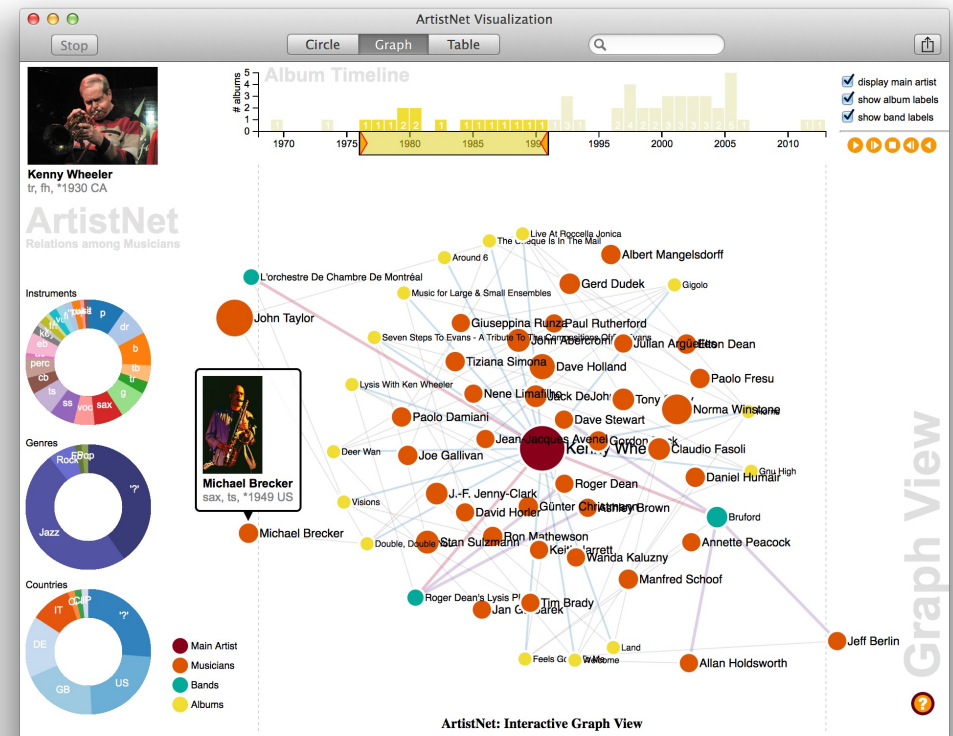
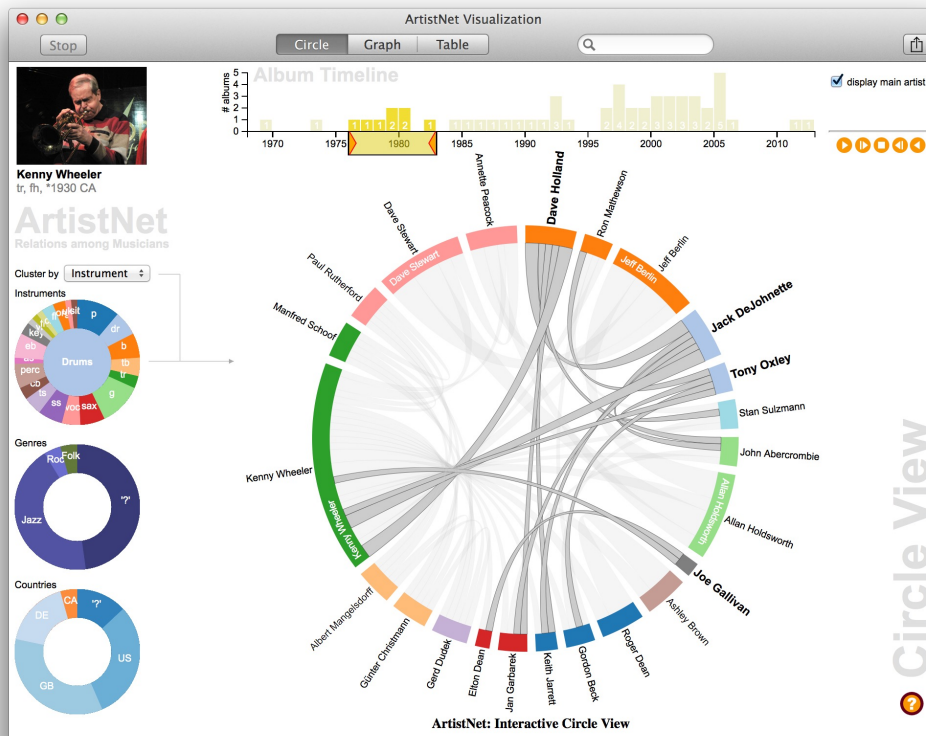
**META SON**

# Web-Crawling for Recommendations

- Recommendations
  - Top10 albums: manually selected (by personal preferences)
  - Famous artists: about 2'400 recommendations
  - Well-reviewed albums: about 1'600 recommendations
- Crawling sources:
  - metacritic.com, amazon.com, digitaldreamdoor.com, ...
  - Crawling of about 100 web pages
- Implemented with Python and the Scrapy framework
  - XPath selectors
  - Mapping to unified musical genres
  - Result exported as JSON data file (crawler runs on server)
  - Provided on metason.net via URL access to JSON file

# ArtistNet Visualisation

- Discover relations among musicians
- Highly interactive SVG visualization
- Based on D3.js library









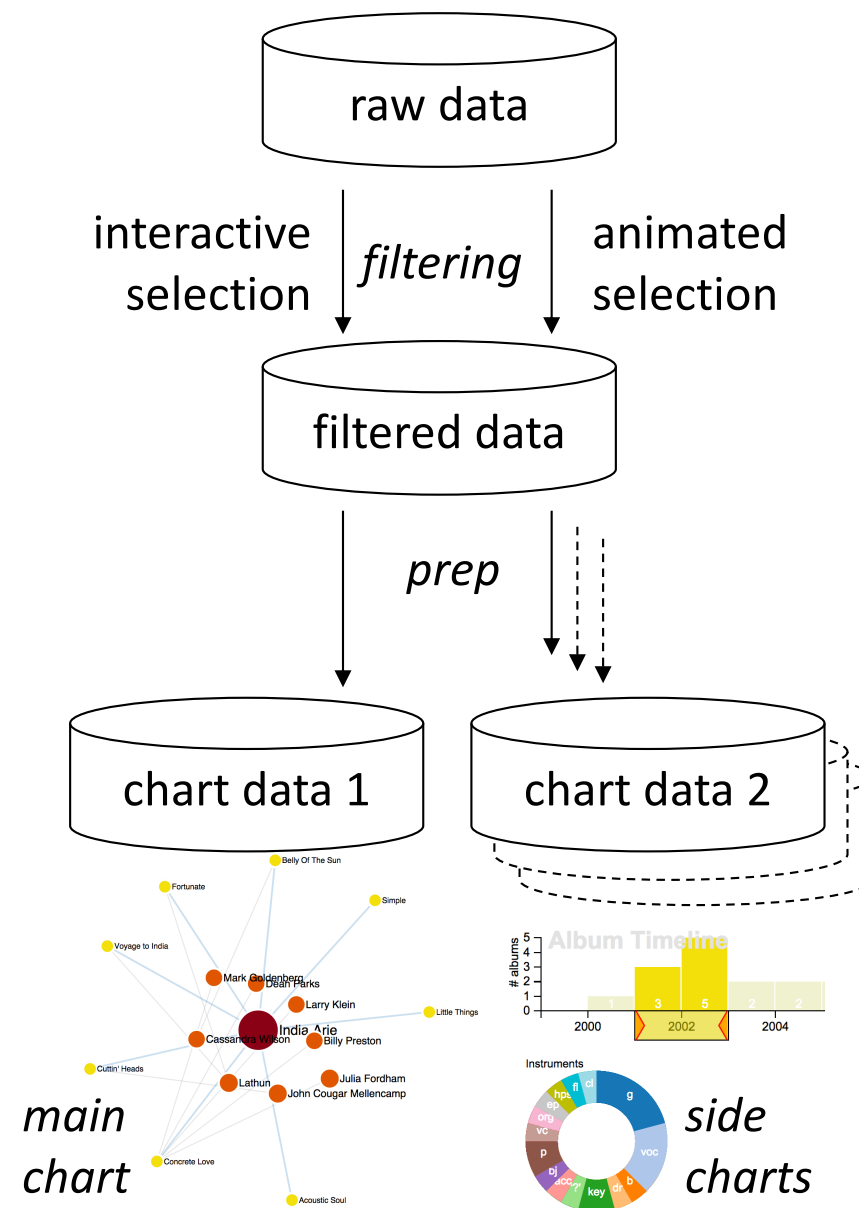
# ArtistNet Visualization

- Multiple diagrams
  - Album timeline
  - Main view: circle, graph, or table
  - Statistical diagrams for instrument, genre & country
- Highly interactive
  - Filter by mouse hovering on statistical diagrams
  - Tooltips on musicians, bands, and albums
  - Select time range of interest
  - Animate over time
  - Double-click for browsing linked data



# d3.js Dataflow

- Import of raw data
  - Entities and relations in JSON
  - Pre-processed/mashuped data
- Data filtering
  - By user interaction
  - By animation (timer)
- Visual mapping
  - Preperation for visualization
    - Chart-specific data arrays
    - Calculate scales and axes
  - Several parallel charts
    - Main chart
    - Side charts



# ArtistNet Community

- Weekly Top 10 artists, bands, and albums
- Recently searched artists, bands, and albums

Swisscom 18:32 74 %

ArtistInfo Top 10

- Eliane Elias  
Bossa Nova Stories  
US 2009, Jazz
- Michael Jackson  
Thriller  
1982, Soul, Pop
- Rolf Lislevand  
Jul I Gammel Tid  
NO 2005, Classical
- Domján Edit, Magyar Rádió  
Egyszer Volt, Hol Nem Volt  
HU 1972, Pop
- Steve Hall  
Green Sounds (Music For...  
US 1974, Jazz, Rock
- Herbie Hancock, Chick Corea  
Herbie Hancock - Chick Co...  
1981, Jazz
- Tony Campa

All Artists Bands Albums

Community Top 10

artists by artist

- Domján Edit  
1932-1972, Pop, Children's
- Michael Brecker  
sax 1949-2007 US, Jazz, Electronic
- Boris Carmeli  
b 1928-2009 IT, Classical
- Brian Blade  
voc, dr US, Jazz
- Herbie Hancock  
p, key \*1940 US, Electronic, Jazz, Soul, Hip
- Bernie Grundman
- John Mayer  
voc, g \*1977 US, Rock, Blues, Pop, Folk, W
- Michael Nick  
vn, Jazz, , Electronic, Rock, Classical, Folk,
- Wolfgang Sedat
- Pat Metheny  
g, tr \*1954, Electronic, Jazz, Classical, Folk

music.metason.net

ArtistInfo Artist/Band born (opt.)

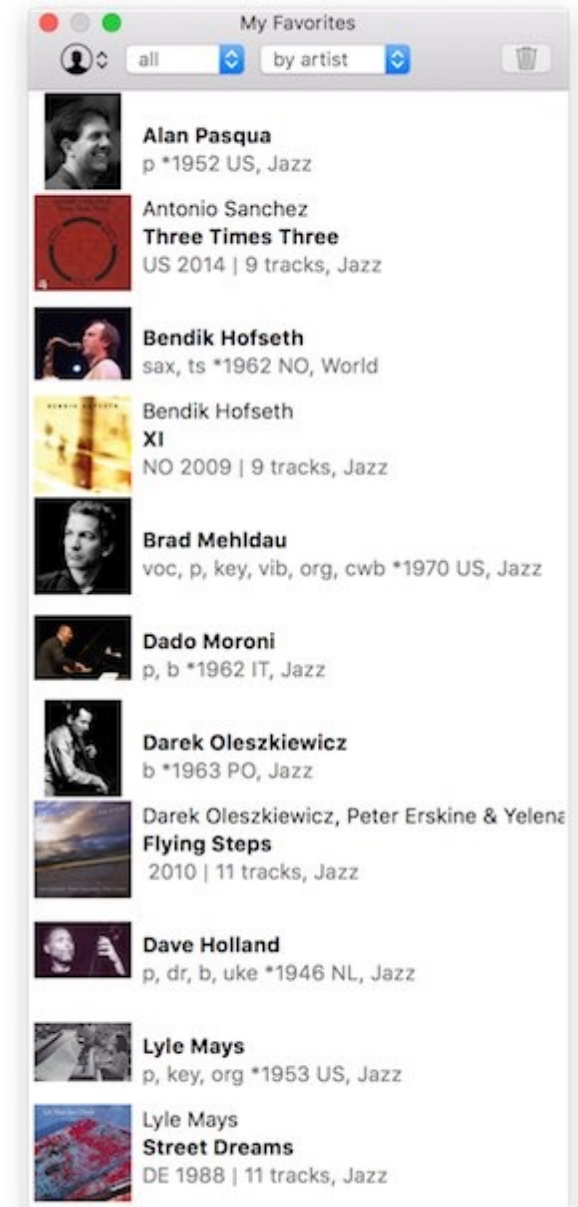
Louis Armstrong US 1901 SEARCH

### Weekly Most Seen Artists and Bands

Top 10 Artists	Top 10 Bands
 Domján Edit 1932-1972	 The Rolling Stones GB Electronic, Rock, Soul, Blues, Pop, Hip Hop, Folk, World, Country, . Reggae, Jazz, Classical
 Michael Brecker US 1949-2007 sax	 Choeur National De L'Opéra De Paris Classical
 Boris Carmeli IT 1928-2009 b	 Radiohead GB Electronic, Rock, Hip Hop, Pop, , Folk, World, Country
 Brian Blade US voc, dr	 Vector Management
	 M.A.E. Electronic, Rock, Classical, Jazz, Pop

# My Favorites

- My Favorites
  - Artists
  - Bands
  - Albums
- Sharing
  - Shared between devices
  - Using iCloud



# Share with Your Friends

- Via email, Messages, Twitter, Facebook, ...

ArtistInfo

Pat Metheny Unity Group

ARTIST - ALBUM

- Pat Metheny Unity Group Band

MUSICIANS

- Antonio Sanchez dr, key, MX
- Ben Williams b, US
- Chris Potter
- Giulio Carmassi
- Pat Metheny g, tr, \*1954 US

COMPOSERS

PRODUCERS

**Chris Potter**

is: Musician  
born: 1971  
plays: Guitar  
Piano  
Saxophone  
plays with: Billy Drummond, Chris Potter, The Chris Potter Quartet, Chris Potter

**BIOGRAPHY**

Saxophone and clarinet player, born on January 1st, 1971. At the age of 3 he began playing with a guitar and piano. He took up the alto sax at the age of 10 and played his first jazz gig at the age of 13. At age 15 he was spotted by Marian McPartland and was asked to join a tour with a unit such as Woody Herman's. He kept with schooling and attended, New York's, the New School, and then Manhattan School of Music. Graduating from Manhattan in 1993. Potter began a long series of sideman work.

**DISCOGRAPHY**

Album Title	Artist	Year	Type
The Sirens	Chris Potter	2013	Album
Transatlantic	Chris Potter And Th...	2011	Album
Follow The Red Line - Live...	Chris Potter	2007	Live
Underground	Chris Potter	2006	Album
Traveling Mercies	Chris Potter	2002	Album
Gratitude	Chris Potter	2001	Album
Unspoken	Chris Potter	1997	Album
Moving In	Chris Potter	1996	Album

Chris Potter

An: myfriend@gmail.com

Betreff: Chris Potter

Von: ArtistInfo Support – support@... Signatur: Ohne

E-Mail-Größe: 72 KB Bildgröße: Originalgröße

**Chris Potter**  
sax, g, p | \*1971

Jazz Musician  
Plays with Billy Drummond Quartet, Chris Potter 10, The Chris Potter Quartet, Chris Potter Quintet, Chris Potter Underground, Chris Potter Underground Orchestra, Dave Holland Big Band, Dave Holland Quintet, Pat Metheny Unity Group, Paul Motian Trio 2000, One, Paul Motian Trio 2000, Two, Scott Colley Quartet

Recommendation sent by Philipp Ackermann from ArtistInfo App.  
Get [more details here](#) or by opening image in ArtistInfo with "Open with ..." menu.

# Concurrency in App

- Speed and user feedback is an issue
  - Most Web services allow only 1 request per second
  - Server problems: not reachable, connection timeouts
- Parallelisation
  - Not easy: dependencies on sequence order
    - Want to show instruments of artists in Outline View
    - Full album needed to get featured artists
  - Threads to collect artists on an album in background
  - Background loading of portrait images
- Three steps refinement of Artist and Album data
  - Lazy loading: searchA..., enhanceA..., deepenA...
  - Caching of loaded artists and albums during App session

# Mash-up Strategy 1/2

- Use meta data wherever possible
  - Works fine for database searches
  - Not available when searching images or URLs
- Use predefined classifications to unify attributes
  - Even simple concept hierarchies improve data quality
- Weighting of data quality
  - For sorting search results
  - To decide for further data loading
- Match „pure“ artist names and album titles
  - Remove special characters & abbreviations
  - Remove optional text: „edition“, „(...)“, „[...]“, CD1, 2003, etc.
- Distinction of artists with same name
  - Match name *and* birth year *and* birth country



# Mash-up Strategy 2/2

- Sequence order on data sources
  1. Metason/Discogs: provides good data on vinyl albums (LPs)
  2. MusicBrainz: good data quantity & quality, used by BBC
  3. DBpedia: additional info (e.g. on instruments)
  4. iTunes: to get the link to the iTunes store
- Three-steps refinement with lazy loading

<i>Artist</i>	Step 1: Search	Step 2: Enhance	Step 3: Deepen
MusicBrainz	name, year, country	IDs, URLs	discography
Discogs	name, bio, thumbImg	members	discography
Dbpedia	name, year, bio	thumbImg, roles, instr., country	genres
iTunes	name, ID, URL		discography
Google		thumbImg	fullImg

<i>Album</i>	Step 1: Search	Step 2: Enhance	Step 3: Deepen
MusicBrainz	name, year, country	thumbImg	tracks
Discogs	name, year	resolve album artists	
Dbpedia	name, year	thumbImg, country	
iTunes	name, ID, URL		tracks, fullImg
Google			fullImg

# Traffic

- On Web: no cookies, no Google analytics
  - So I don't know
  - About 100k clicks via Google search
  - About the same direct?
- Apps
  - Mac Downloads: ca. 2/month
  - iOS Downloads: ca. 10/month
    - In-app purchase: 0!

Google Search Console

Your March performance  
on Google Search



<https://music.metason.net/>



111K

Clicks (web)



7.62M

Impressions (web)

# Contact

[www.metason.net](http://www.metason.net)

Metason by  
Philipp Ackermann  
[philipp@metason.net](mailto:philipp@metason.net)

