

## Case Study



## Musimap

## Neo4j Provides Musimap with a Real-Time Recommendation &amp; Search Engine for the Music Industry

**INDUSTRY**

Music

**USE CASE**

Real-Time Recommendations

**GOAL**

To create the most exhaustive database of music tracks

**CHALLENGE**

To map all music titles, each with 55 weighted description criteria, to allow for in-depth processing and real-time recommendations

**SOLUTION**

Neo4j provided real-time recommendations due to its ability to manage complex databases with an unlimited numbers of entries.

**RESULTS**

- Processing and search times reduced more than tenfold
- System availability 24/7

**The Company**

[Musimap](#) is a personalized music search tool that provides real-time music recommendations for listeners. Thanks to a socio-psychological, musicological and lexicological approach coupled with signal analysis and text retrieval, Musimap's technology is a unique hybrid between human expertise and automated algorithms. Founded in 2014, the company uses Neo4j to manage its database that includes almost 3 billion information items — including 50 million titles and 5 million artists.

**The Challenge**

Musimap cofounder Dr. Pierre Lebecque — a sociology and musicology researcher — was convinced that musical culture was the result of the interweaving of different musical references. On this basis, he decided to create a database that acted as a repository for every published piece of music in the world. Their customers span from streaming services to music promoters and restaurants.

For each song entered into the database, Musimap allocates 55 weighted description criteria that allow their database to perform in-depth searches and title recommendations. To do this, the team first built a solution in a standard SQL database, which experienced performance issues as the size of their database grew.

It also became clear that a visual depiction of their data would allow them to better serve their customers. This naturally led Musimap to explore graph technology.

**The Strategy**

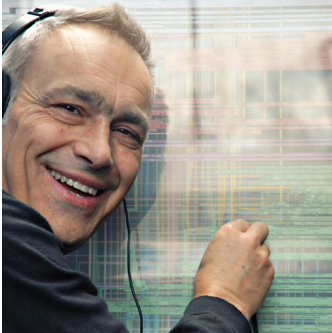
Lebecque's original idea was for each artist and track to be linked in an equation and relationship of influence.

"If we take James Brown, for example, we can identify that his influences were gospel, the sermons of a preacher, soul, a binary African rhythm...and all these influences have produced a movement: funk," explains Lebecque. "As the range of rhythms or emotions is limited, it is therefore perfectly possible to mathematically formalise each title, and from this, to map any musical production within a network of interwoven influences."

What makes the Musimap project so intelligent is its capacity to create a musical lexicology and then weigh that lexicology — enabling each descriptor to be defined in relation to other chosen words. Therefore the company can qualify certain tracks as "rock with a touch of reggae".

The overarching goal was for Musimap to decode the DNA of music to be as exhaustive as possible in its title descriptions to enable complex searches in real time.

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– *Pierre Lebecque,*  
*Musicology researcher and the creator of the Musimap project*

“When it came to importing our database, Neo4j perfectly met our requirements. We created a script on SQL which called up the Neo4j API. And then Neo4j did the rest by integrating the whole of our database.”

– *Frédéric Notet,*  
*Co-founder and Chief Technical Officer of Musimap*

### The Solution

In 2013, having quickly ruled out MySQL or PHP/Flash databases for reasons of performance, Musimap discovered graph databases, and in particular [Neo4j](#), as being the only options that were capable of responding to the company's requirements.

Shortly after switching to Neo4j, the Musimap team quickly realized the benefits of the solution: easy to use and configure, as well as reduced processing time and query response time. Via a newly-developed API, the company was able to quickly import and personalize its database.

Frédéric Notet, co-founder and chief technical officer of Musimap, is happy with the choice of Neo4j. “When it came to importing our database, Neo4j perfectly met our requirements,” Notet remarks. “We created a script on SQL which called up the Neo4j API. And then Neo4j did the rest, by integrating the whole of our database.”

With its technology now ready for market, Musimap opted for a business model that would allow both for the creation of a recommendation algorithm — used by companies to create playlists and categorize their catalogues — and assistance with creating film music, a service aimed at AV professionals that provides guidance based on movie genre.

Using Neo4j, Musimap was able to define an advanced search mode based on multiple criteria, such as rhythm, instrumentation, 400 complex moods and 100 listening contexts. This provided the tool with the ability to provide recommendations based on nuanced emotions, and make requests for something along the lines of a title that resembles Michael Jackson's *Thriller* but in a happier tone.

### The Results

Since switching to Neo4j, the search processing time is now virtually real time — 10 times faster than their previous database — and there is no longer a limit on the number of data points Musimap can add to their database.

With high availability and multiple master-slave relationships, Neo4j also prevents the service from ever going offline. If an issue with the master is detected, one of the slaves can automatically be elected to take its place. In a similar vein, because there are multiple slaves, if one ever goes offline another slave can take its place.

Notet concludes, “The teams at Neo4j are totally open and it is really pleasant to find that our new development ideas are always well received. I can't think of another relationship that is as fluid with the development teams.”

Neo4j is the leader in graph database technology. As the world's most widely deployed graph database, we help global brands – including [Comcast](#), [NASA](#), [UBS](#), and [Volvo Cars](#) – to reveal and predict how people, processes and systems are interrelated.

Using this relationships-first approach, applications built with Neo4j tackle connected data challenges such as [analytics and artificial intelligence](#), [fraud detection](#), [real-time recommendations](#), and [knowledge graphs](#). Find out more at [neo4j.com](#).

Questions about Neo4j?

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