

MONITORING AND VISUALIZING LAST.FM

DOCUMENTATION

MONITORING AND VISUALIZING LAST.FM

Final Year Project of Christopher Adjei and Nils Holland-Cunz
Supervised by Prof. Eva Vitting and Prof. Philipp Pape
University of Applied Sciences Mainz 2008

Table of Contents

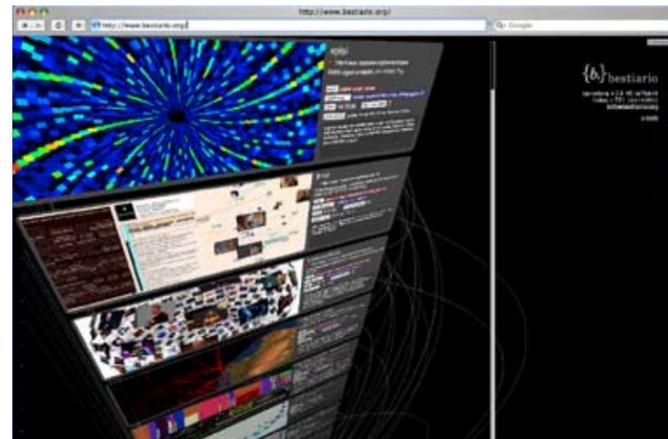
01	Motivation The Topic and our Intention	06-07
02	Research #01 Research and Analysis of other Projects #02 Searching for Suitable Data Sources #03 What means Last.fm? #04 What is an API?	08-09 10-11 12-13 14-15
03	Finding the Concept #01 Questions #02 Scopes of Topics and Form of Presentation #03 Getting and Restructuring the Data	16-17 18-19 20-21
04	Design and Visualizing Introduction: Distribution of Users #01 Research #02 First Visualisations #03 Final Graphic Topic Scope 1: Comparing Fan-Groups #01 Question/Idea #02 First Visualisations #03 Approach Circular Diagram #04 Approach Circular Diagram without Connections #05 Approach Cochlea-Shape #06 Approach with Individual Forms of Genres #07 Approach with Mirrored Form #08 Approach with Mirrored Form and Overlay #09 Final Approach »Amplifier« Topic Scope 2: Fluctuation of Fans #01 Idea Development #02 First Realisation #03 Finalizing the Graphic #04 Final Poster and Colour-Coding Topic Scope 3: Album-Release #01 First Scribbles #02 First Realisation #03 Finalizing the Graphic #04 Poster and Colour-Coding Topic Scope 4: Cumulation of Genres #01 Question/Idea #02 2D und 3D #03 Realizing Application #04 Realizing Poster	22-23 24-25 26-27 28-29 30-31 32-35 36-37 38-39 40-41 42-43 44-45 46-47 48-49 50-51 52-53 54-55 56-57 58-59 60-61 62-63 64-65 66-67 68-69 70-71
05	Formative Elements #01 Composition of the Poster-Label #02 Typeface	72 73
06	Resumé What have we learned? Appendix Bibliography Impressum	74 74 75

Research

#01 Research and Analysis of other Projects



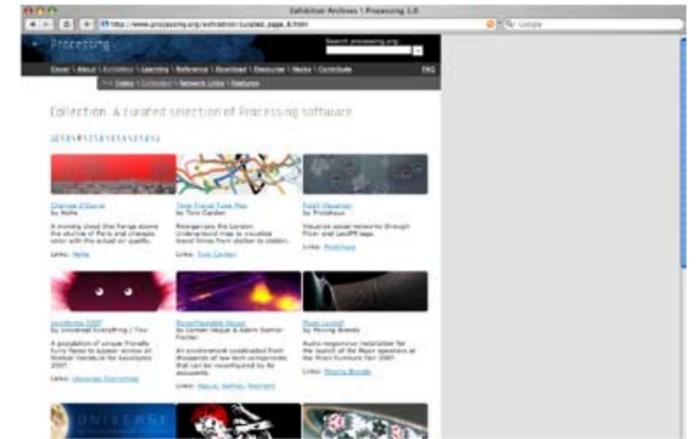
off.ws



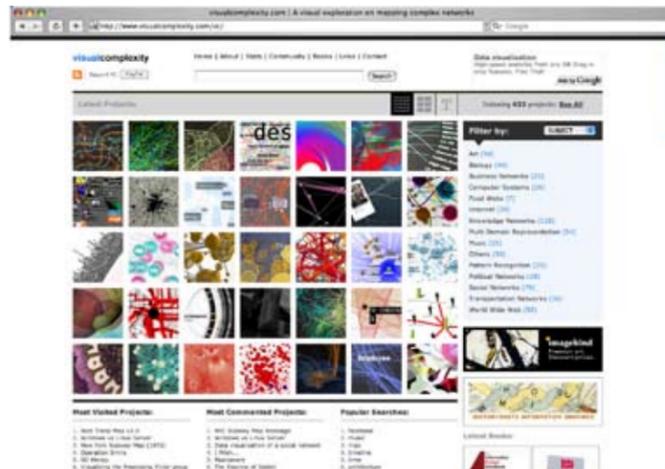
bestario.org



manyyeyes.alphaworks.ibm.com



processing.org



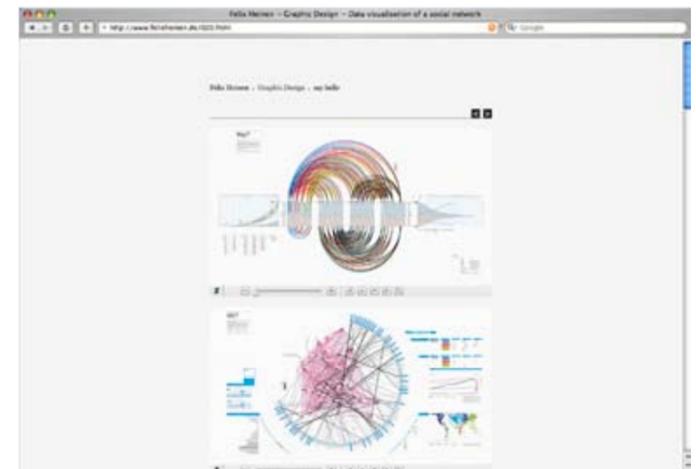
visualcomplexity.com



benfry.com



senseable.mit.edu/nyte/

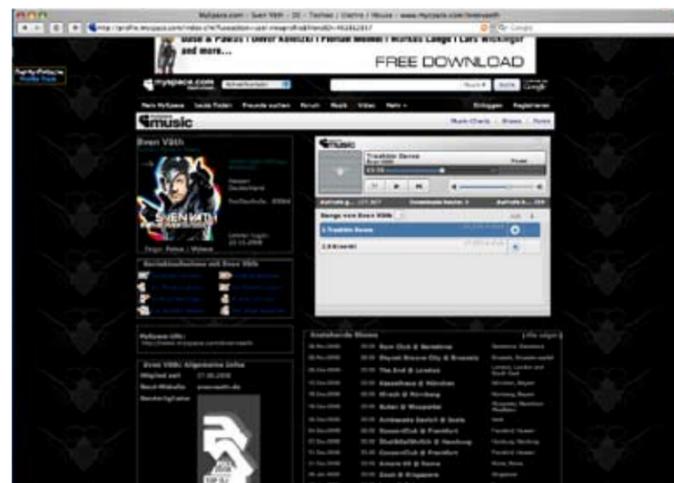


felixheinen.de

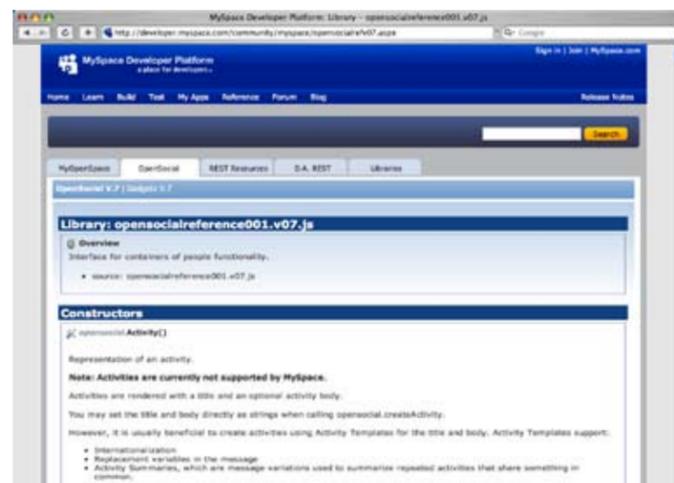
At first, we researched in theme-specific and other internet portals dealing with the object of data visualizing. We wanted to find out what makes these works interesting and what is »State of the Art«. Thereby, we came across projects by Ben Fry, Aaron Koblin and the works of other design students as e.g. Michael Groß, Felix Heinen and Stefan Bräutigam. We then noticed that certain visualizing methods and trends, as e.g. the semi circle or the circular diagram were predominant, as also in other fields of graphic

design. These informations now served us as a basis for orientation in order to produce primary visualisations for our project. At that point, however, it was not yet clear to us how our view on these works was to change as the project went on.

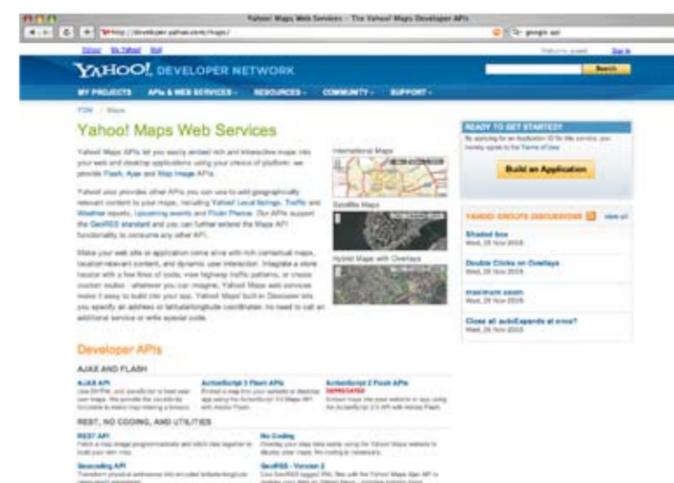
#02 Searching for Suitable Data Sources



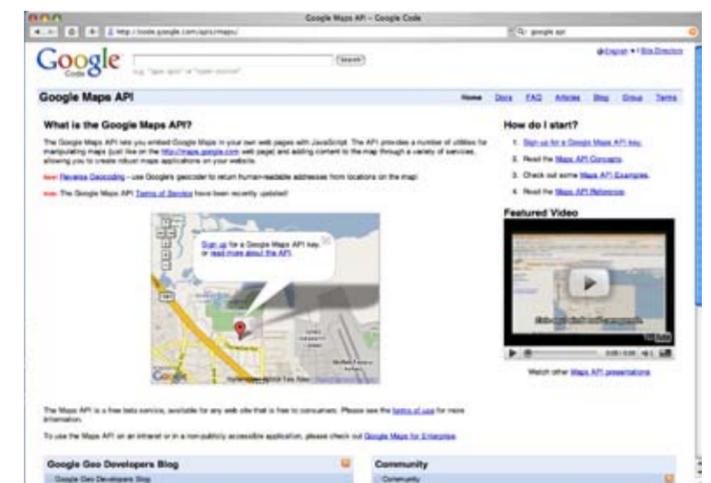
myspace.com/svenvaeth



developer.myspace.com



developer.yahoo.com



code.google.com/apis

In search of suitable data for programmed visualisations we next analyzed the social network »MyspaceMusic«. There bands as well as soloist artists, wishing to present themselves online with their music, may start a profile site and upload their own songs. Our first idea was, to sort out all the artists' profiles and to compare their touring-data. We wanted to find out if there were interdependences among the artists' tours, and if such correlations lay within a national or international scope.

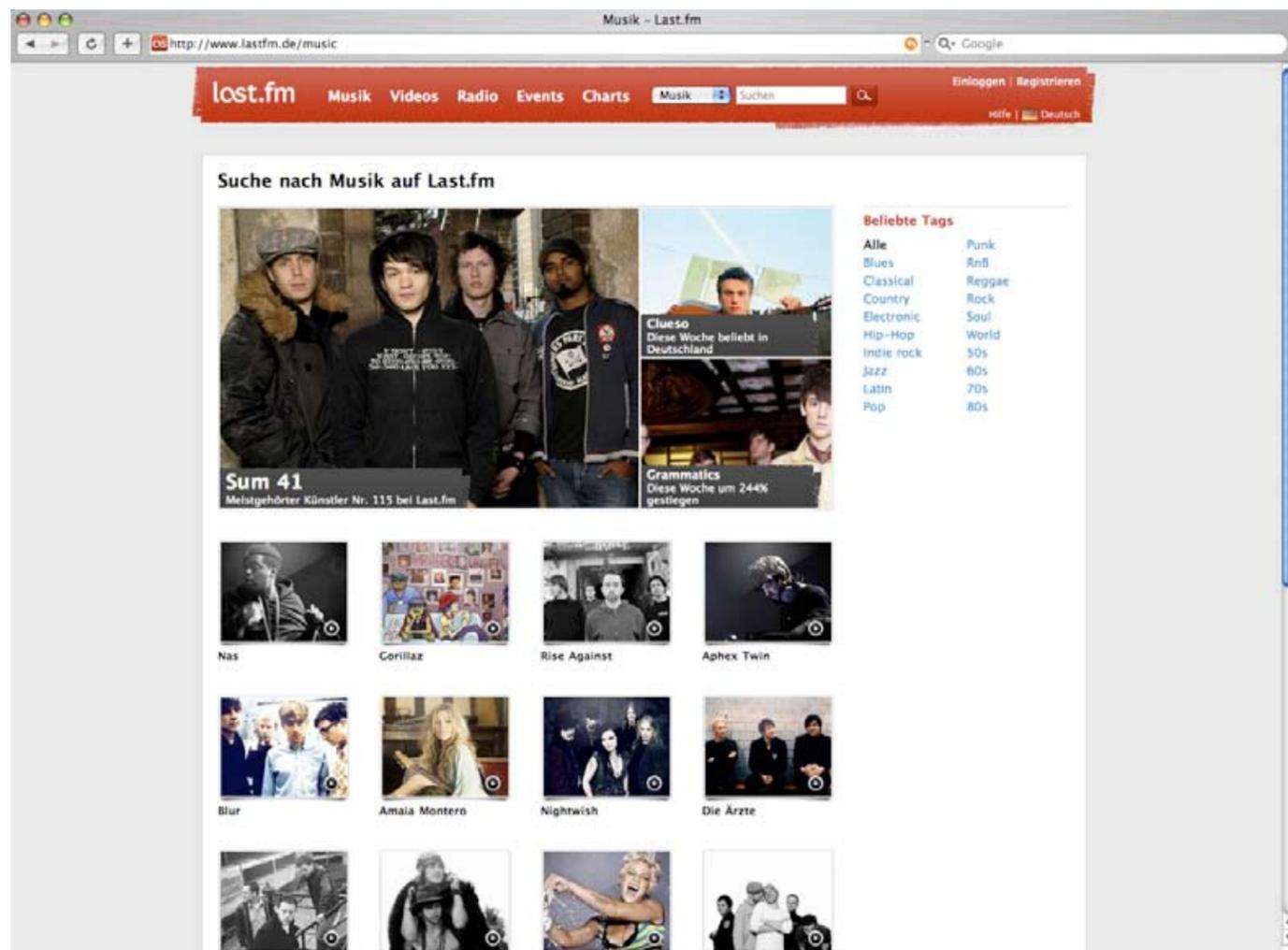
However, it turned out that appx. 50% of the artists' profiles on MySpace were »joking-profiles« and therefore were not a reliable data source. In our further research we came across the data base of Last.fm, which had a far better proportion of suitable to unsuitable data. To us, this data source opened up a far wider range of possibilities than the MyspaceMusic data. We decided to use the Last.fm data base for our project and to work out of it a series of interesting aspects which we intended

to observe by means of the data saved there. What we wanted to find out in a next step were these questions:

1. Which artist is a »one-hit wonder«, and which has got a constant fan-community?
2. Are the supporters of a rockband more receptive forwards various fashions of music than the fans of an hip-hop artist?

3. In which towns do certain genres of music cumulate, and in which countries is a newly released album heard first?

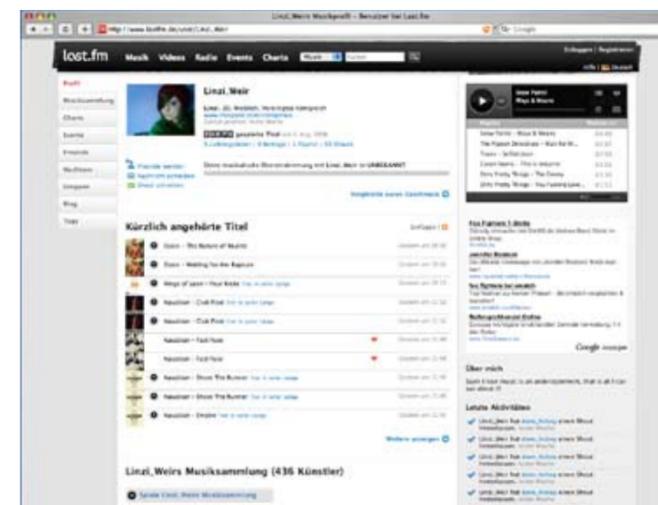
#03 What means Last.fm?



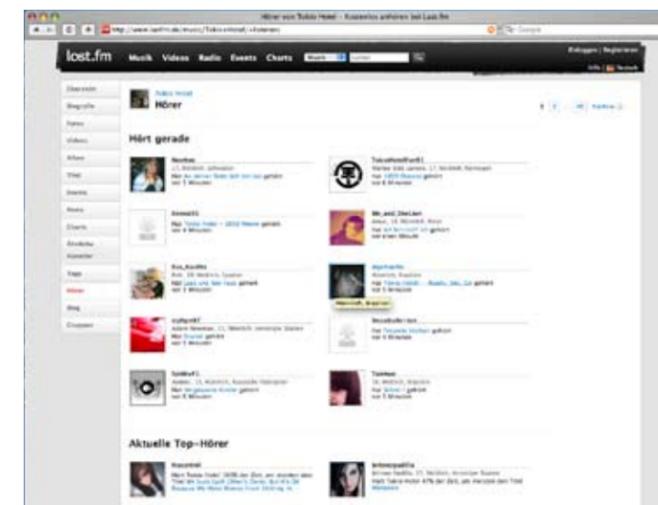
lastfm.de/music

As everybody knows, nowadays music is not only offered in the record shop or at concerts, but also in a large variety in the internet, whereby the offer of various webradios is very voluminous. Yet, in most cases we do not know the audience. A lot of social networks such as »studiVZ« or »facebook« enter directly into the user's wish to present himself with his hobbies and interests and to communicate on that. Other networks such as »Last.fm« go one step further and look for people with a very

special interest in music as their target group. Last.fm is a worldwide social online-network along with a personalized radio station. The network-user receives recommendations as to music and concerts. These recommendations are based on data generated by the user's own listening-behaviour. Within this context he has the possibility of listening to various radio stations, of placing »tags« for bands listened to as well as of communicating recommendations for music. He can also inscribe concert-data

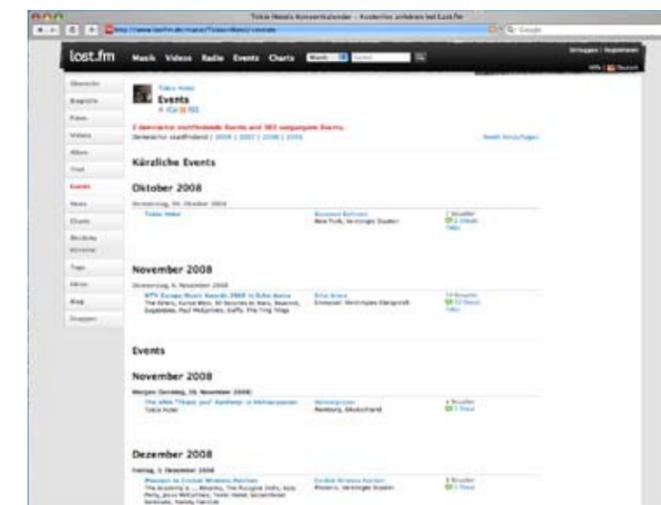


lastfm.de/User/Linzi_Weir (Profil Site of Linzi Weir)

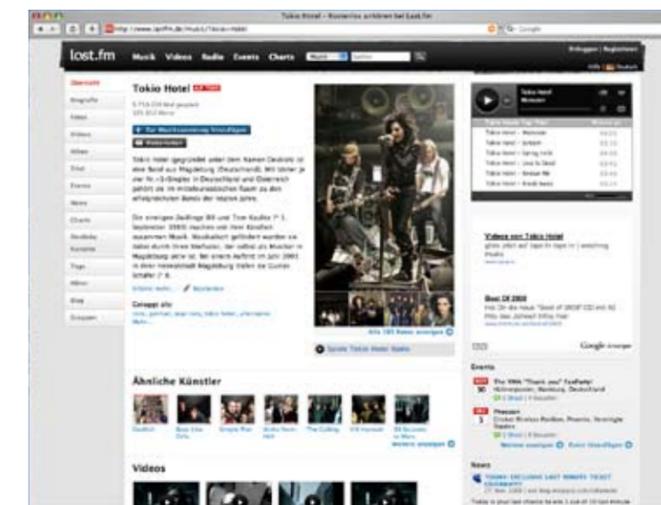


lastfm.de/music/Tokio+Hotel/+listeners

and biographies of artists as well as lay out his own artist's or label's profile. A further particularity is the so called »scrobbling« of music. Thereby, the playing of each track with the Last.fm Player or with an external plug-in is saved in a data base. This data base is always freely accessible by an API and served us as a source of data for our Visualisations.



lastfm.de/music/Tokio+Hotel/+events



lastfm.de/music/Tokio+Hotel

#04 What is an API?

The screenshot shows the Last.fm API documentation for the `artist.getSimilar` service. The page is titled "Last.fm Web Services" and includes a navigation menu with "API Doc", "Overview", "User Authentication", "Submissions", "Playlists", "Downloads", "REST requests", and "XML-RPC requests". The main content area is titled "artist.getSimilar" and describes the service as "Get all the artists similar to this artist". It provides an example URL: `http://ws.audioscrobbler.com/2.0/?method=artist.getsimilar&artist=cher&api_key=b25b959554ed7605...`. The "Params" section lists `limit` (Optional), `artist` (Required), and `api_key` (Required). The "Auth" section states that this service does not require authentication. A "Sample Response" is shown in XML format, listing similar artists like "Venetian Snares". The "Other Formats" section mentions that the data is also available as a feed in `txt` format.

lastfm.de/api (Explanation of the API-Method: artist.get.similar)

An application programming interface (API) is a set of routines, data structures, object classes and/or protocols provided by libraries and/or operating system services in order to support the building of applications. Besides the access to data bases and to hardware such as hard drives or graphic boards, an API may also enable a developer to produce the components of graphical user interfaces and to simplify this procedure. Nowadays, a lot of internet providers also provide APIs. In a wider sense, the port

of each »library« is termed »API«. Which way did we obtain the data?

1. We sent a request to the data base of Last.fm by the programming environment Processing.
2. We received data in form of xml-files, which we read out by means of a library and then saved for further processing in text-files.

The screenshot shows the Last.fm API documentation for the `artist.getEvents` service. The page is titled "Last.fm Web Services" and includes a navigation menu with "API Doc", "Overview", "User Authentication", "Submissions", "Playlists", "Downloads", "REST requests", and "XML-RPC requests". The main content area is titled "artist.getEvents" and describes the service as "This service does not require authentication." It provides a "Sample Response" in XML format, listing events for the artist "Cher" at "The Colosseum at Caesars Palace" in "Las Vegas". The "Other Formats" section mentions that the data is also available as a feed in `rss` and `ical` formats. The "Errors" section is also present.

lastfm.de/api (Example of the response in the form of an xml-file)

Concept

#01 Questions

1 Countries

- 1.1 How large is the quantity of the users in one country?
- 1.2 What is the proportion of active to inactive users in a country?

2 Fluctuation

- 2.1 Who listens to which music in which country?
- 2.2 How does the distribution of the 1,000 top listeners of an artist vary in relationship to place and time?
- 2.3 Do the touring-data influence this distribution?
- 2.4 Do the touring-data influence the above mentioned distribution of »similar artists«?

3 Preferences of music

- 3.1 Are the listeners of the tag-genre X more receptive towards other tag-genres than the listeners of the tag-genre Y?
- 3.2 Are the listeners of country X more receptive towards various tag-genres than the listeners of country Y?
- 3.3 Is there any correlation between the result of 3.2 and the GDP, economic growth and religion?

4 Concerts

- 4.1 In which towns do the concerts in country X take place? (areas of urban cumulation?)
- 4.2 Which tag-genres do the concerts taking place in country X belong to?
- 4.3 Where do all concerts belonging to one tag-genre take place in country X? (areas of urban cumulation?)
- 4.4 Does the distribution of the concerts as to tag-genres depend on GDP, economic growth and religion?

5 Preferences of music/gender

- 5.1 Which tracks by one artist are more preferred by women resp. men?
- 5.2 Which genres in country X are more favoured by women resp. men?

6 Album-Release

- 6.1 How does an album or a single-release influence artist's popularity?
- 6.2 Does an album/single-release influence the popularity of his »similar artists« (scrobble-data)?
- 6.3 How do the top-listeners of a track spread after an album or single-release?

As a conceptual basis we worked out a list of questions the answers to which were to be relevant to specific target groups. We assorted these questions from various points of view: Whom is the question interesting to? How often does a data set have to be captured again? How many steps and stations must be passed and taken until the data can be used for a visualisation?

Länder

Wie ist das Verhältnis von aktiven zu inaktiven Usern in einem ausgewählten Land?

Vorgehensweise:

- Auslesen der Namen jeder 200. User-Verzeichnisseite eines Landes
- Rausfinden wer aktiv und wer inaktiv ist.

Wie viele Datensätze werden aufgezeichnet?

Wie interessant sind die Daten?

W.

A.

Parsing:



Datenquellen:

Last FM

1.1

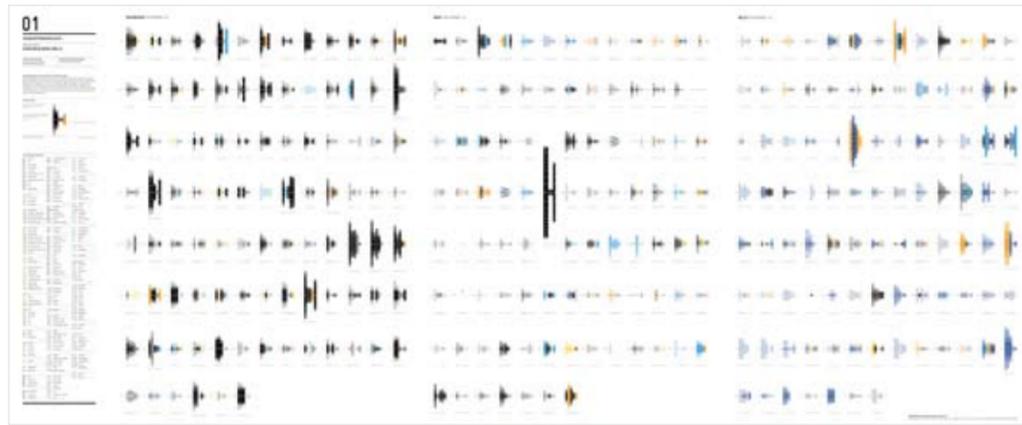
Passt zusammen mit:

Evaluation of a question on a schedule created by us

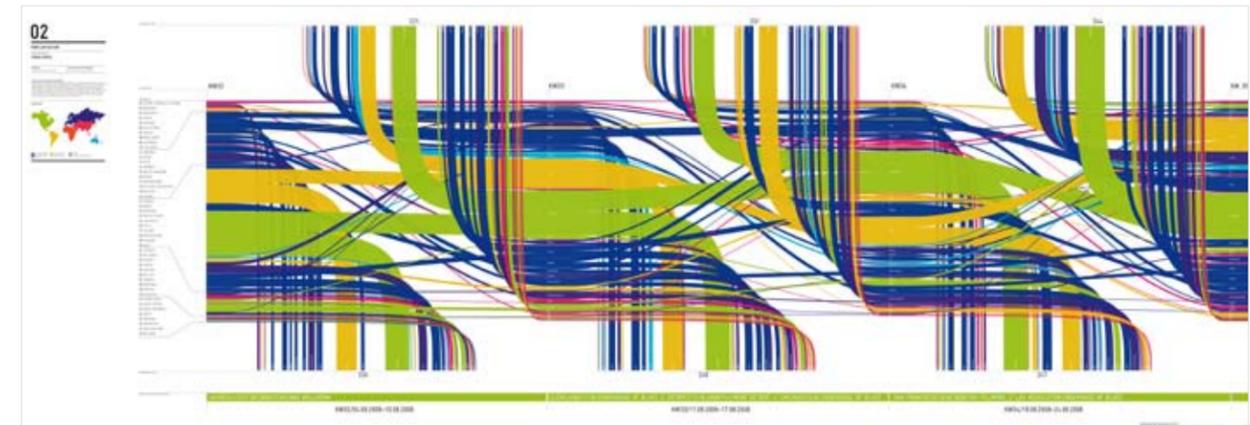
#02 Scopes of Topics and Form of Presentation



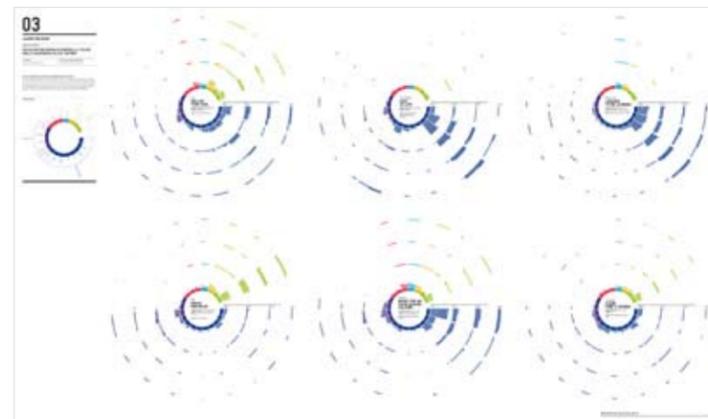
Introduction



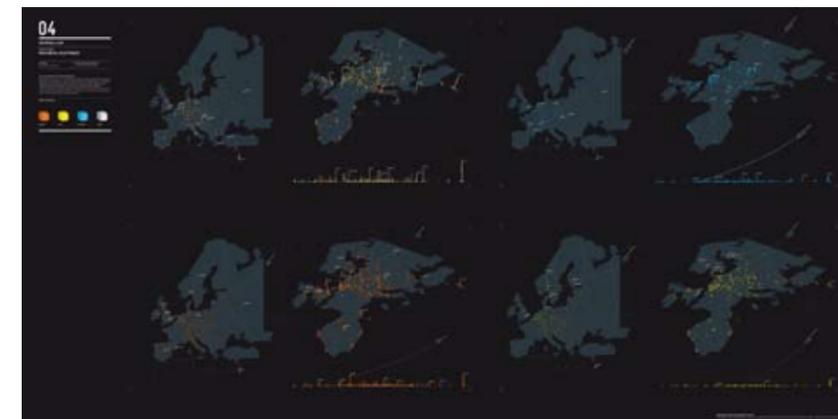
Topic Scope 1, Comparing Fan-Groups



Topic Scope 2, Fluctuation of Fans



Topic Scope 3, Album-Release



Topic Scope 4, Cumulation of Genres

As mentioned at the beginning our initial approach resulted in various questions, which we first of all gathered. Next we filtered some of them out and grouped them in five scopes of topics. Those are related to issues that either run over a longer period, or are place-related, or show properties. Consequently, we had to capture all the data necessary for that and link them up to each other. On the following pages, an overview of these data links is presented for each scope. The five scopes are as follows:

Introduction: Distribution of Users
Representation of the distribution of users of Last.fm and explaining introduction for the following topic scopes.
Realisation: Poster, 1100x750 mm

Topic Scope 01: Comparing Fan-Groups
Comparing random samples of the »top-listeners« of Radiohead, Moby and Nelly. Realisation: Poster, 1100x2690 mm

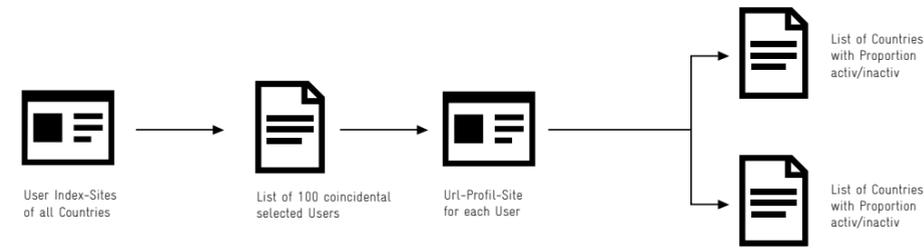
Topic Scope 02: Fluctuation of Fans
Demonstration of weekly listeners leaving and coming by of various music groups. Realisation: Poster, 1100x3235 mm

Topic Scope 03: Album-Release
Visualizing the place-related extension of the listeners of certain albums after the release on Last.fm.
Realisation: Poster, 1100x1890 mm

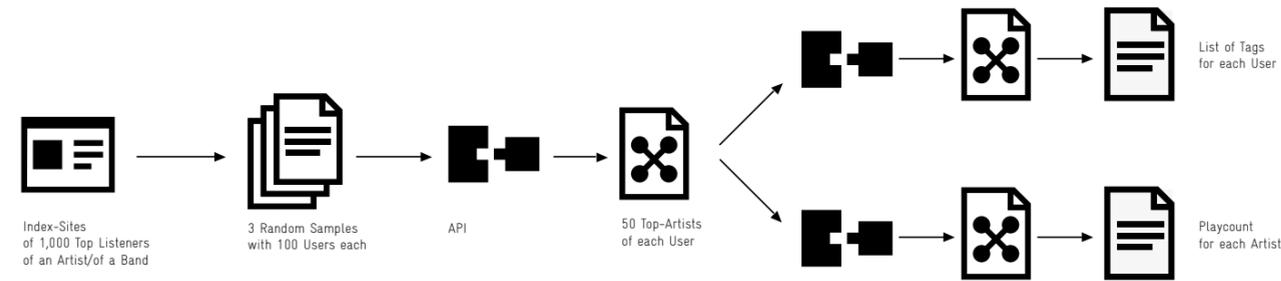
Topic Scope 04: Cumulation of Genres
Presentation and Categorisation of the concert distribution within europe. Realisation: Interactive Application & Poster, 1100 x 2215 mm

#03 Getting and Restructuring the Data

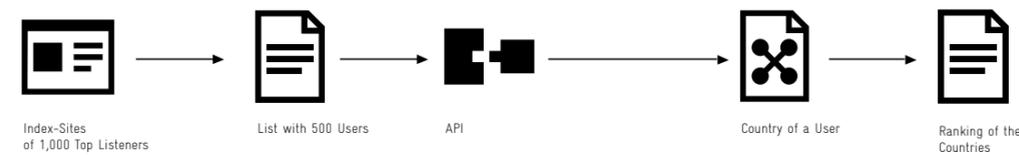
Distribution of Users



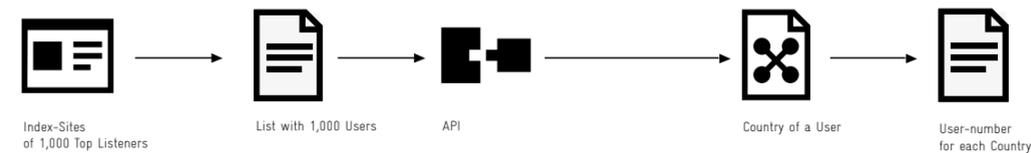
01 Comparing Fan-Groups



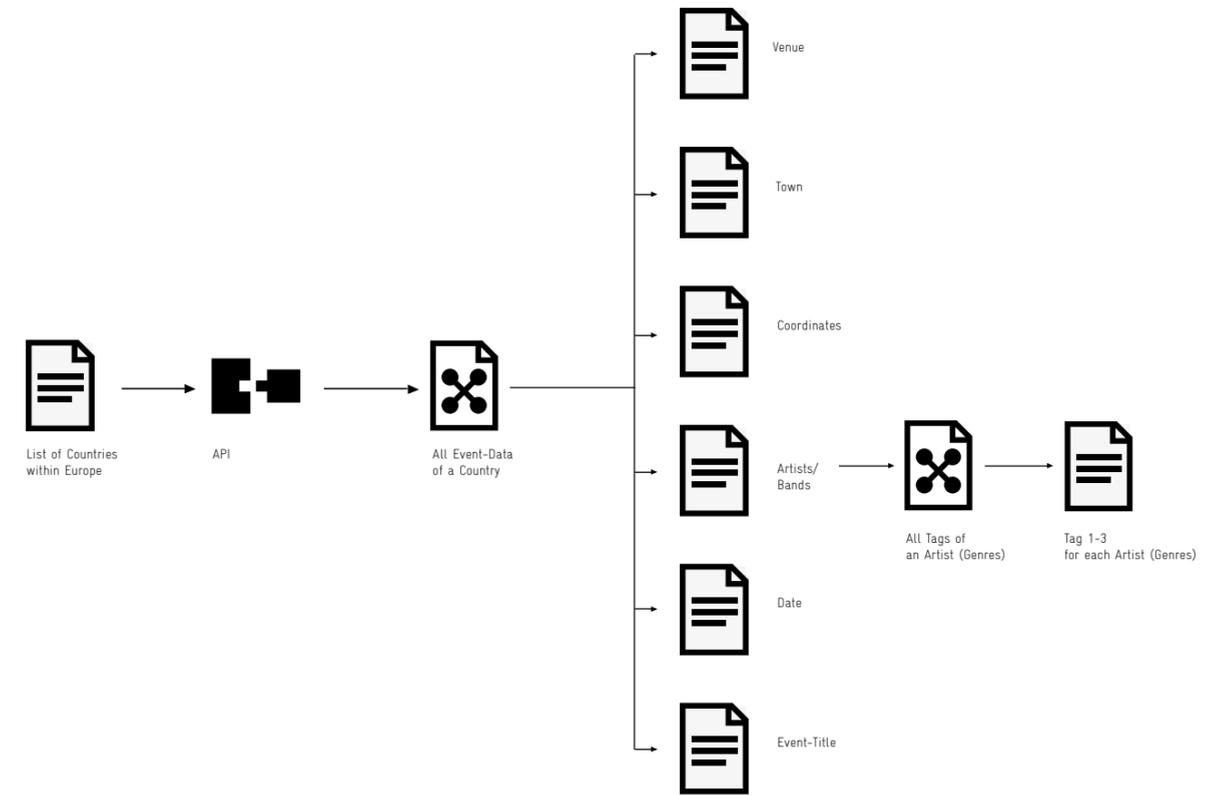
02 Fluctuation of Fans



03 Album-Release



04 Cumulation of Genres

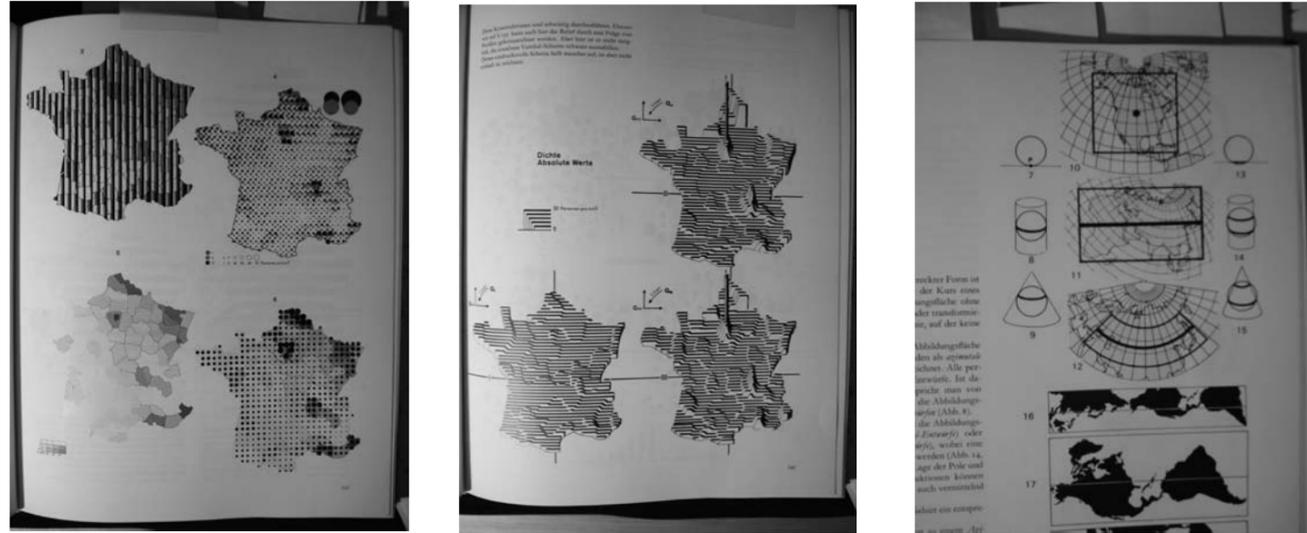


Getting and restructuring the data we used is shown by the process diagrams. The procedure is always similar except the topic scope »Distribution of Users«. By an API method a request is made to the the data base of Last.fm. The data base sends back an xml-file which we decode. It is then being restructured and saved in the form of a text-file. An exception, as mentioned, is the scope »Distribution of Users« in which we directly search

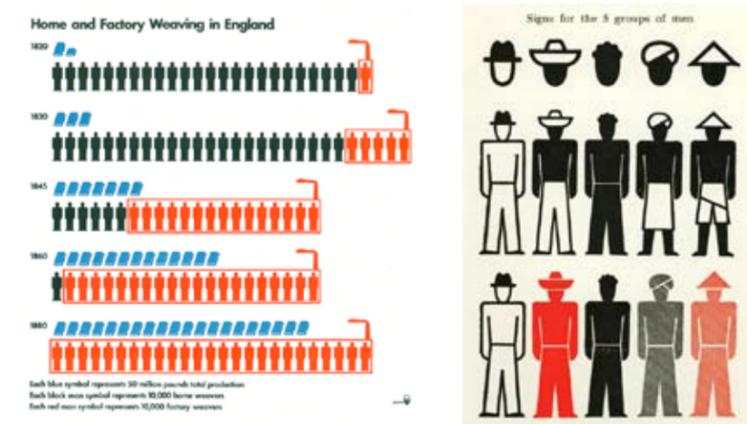
a country index-site site on Last.fm for information. These are then saved in the form of text-files, as well.

Introduction: Distribution of Users

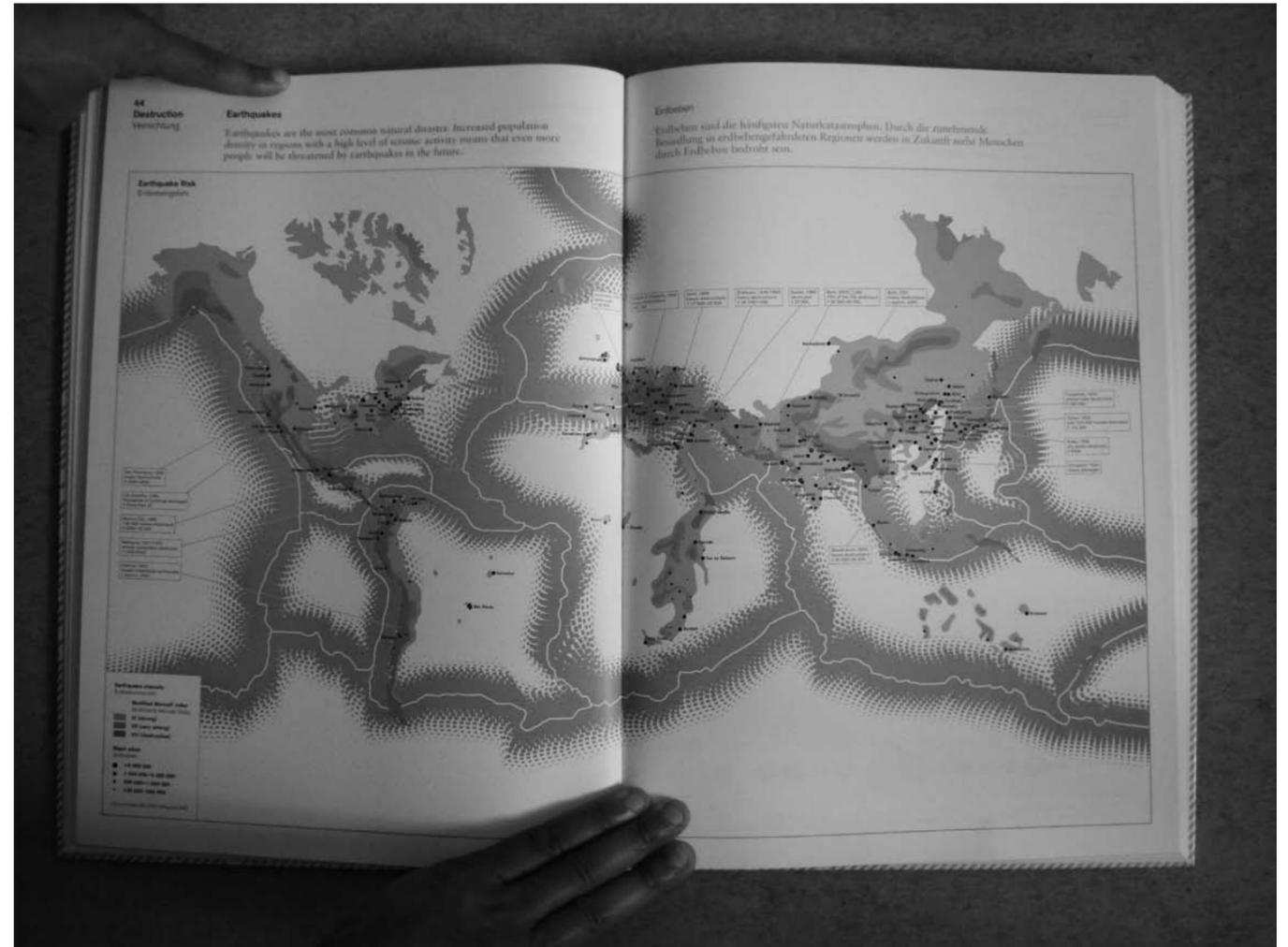
#01 Research



Examples in the book »Sémiologie graphique: Les diagrammes, Les réseaux, les cartes«, by Jacques Bertin



Typical Visualisations by Otto Neurath



Example in the book »Atlas of Shrinking Cities«

As the headline already indicates we intent to mediate an impression of the worldwide distribution of the Last.fm users. These are found out by means of the country index-sites on Last.fm, to which one can get by the user's searching mask. During a more precise investigation we found out that a large number of the registered users had not visited their profiles for more than half a year. We called these »inactive users«. On the basis of the »law of the large numbers«* we chose 100 users for each country by

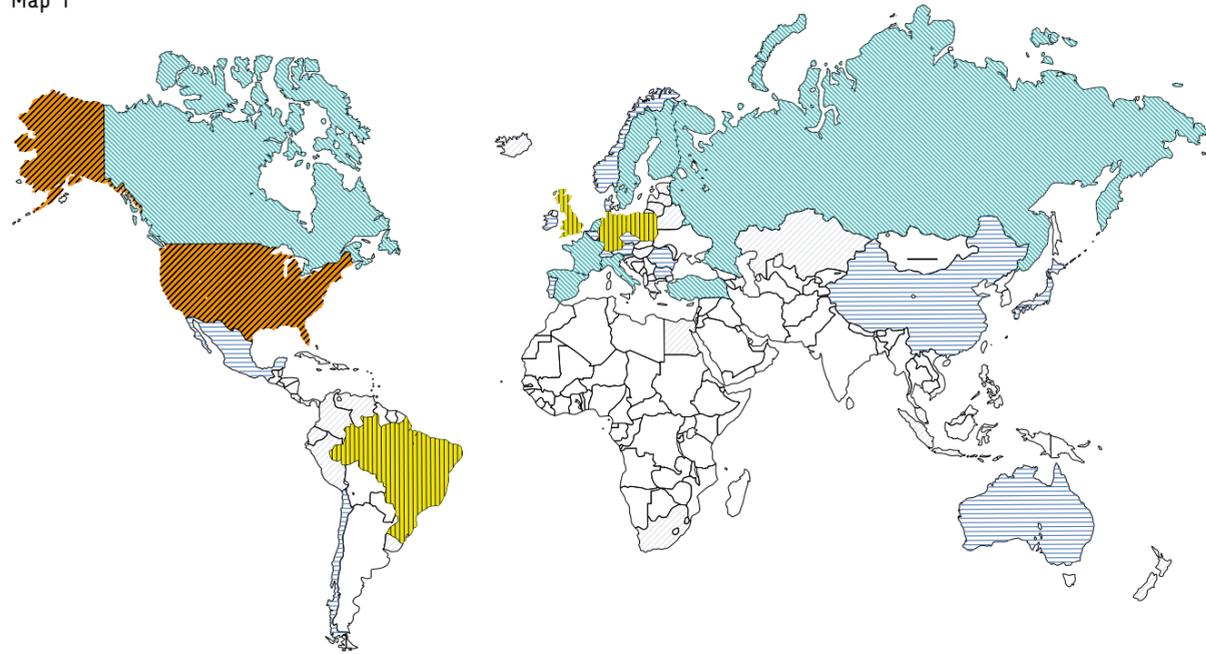
coincidence. By this random sample we were able to re-conclude the proportion of active to inactive users as well as of male to female users. At the same time we started the research of various possibilities of visualisation. Thereby we came across among others the cartographer Jaques Bertin, the information scientist Edvard Tufte and the Austrian philosopher and economist Otto Neurath.

*The law of large numbers (LLN) is a theorem in probability that

describes the long-term stability of the mean of a random variable. Given a random variable with a finite expected value, if its values are repeatedly sampled, as the number of these observations increases, their mean will tend to approach and stay close to the expected value.

#02 First Visualisations

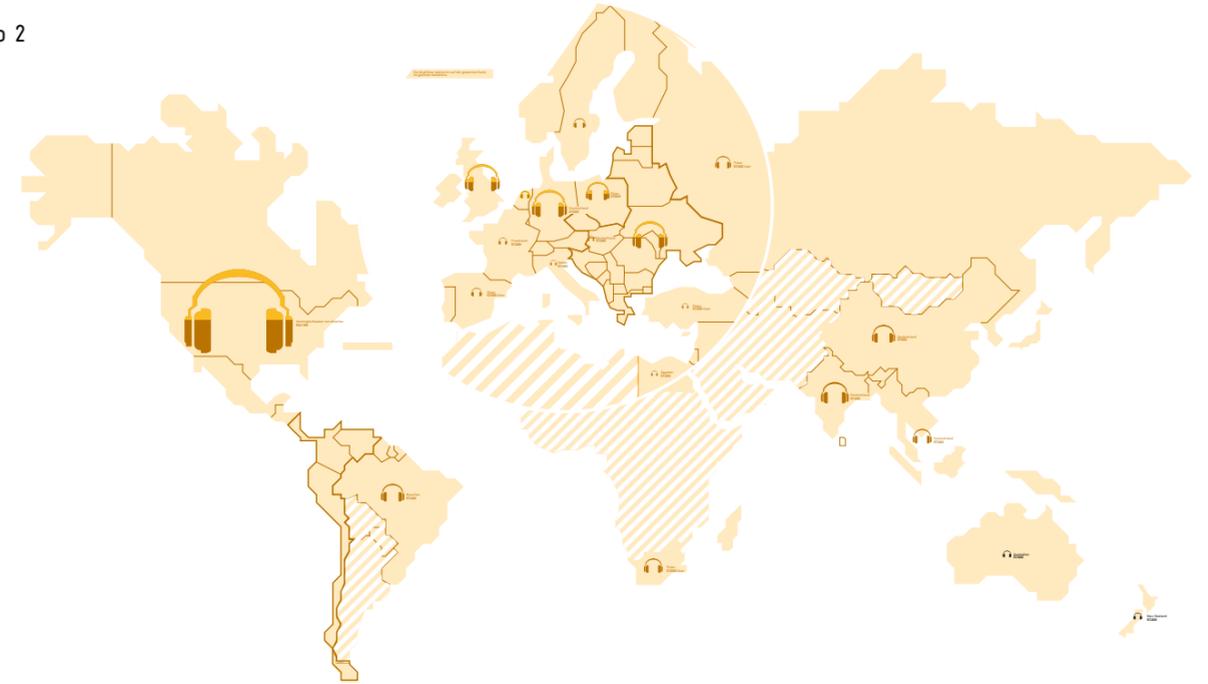
Map 1



Map 1:
First we tried to visualize the number of users of a country on a world map by colour shades and diverse patterns.

Map 2:
In a further step we decided to picture the various amounts of users by a headphone icon.

Map 2



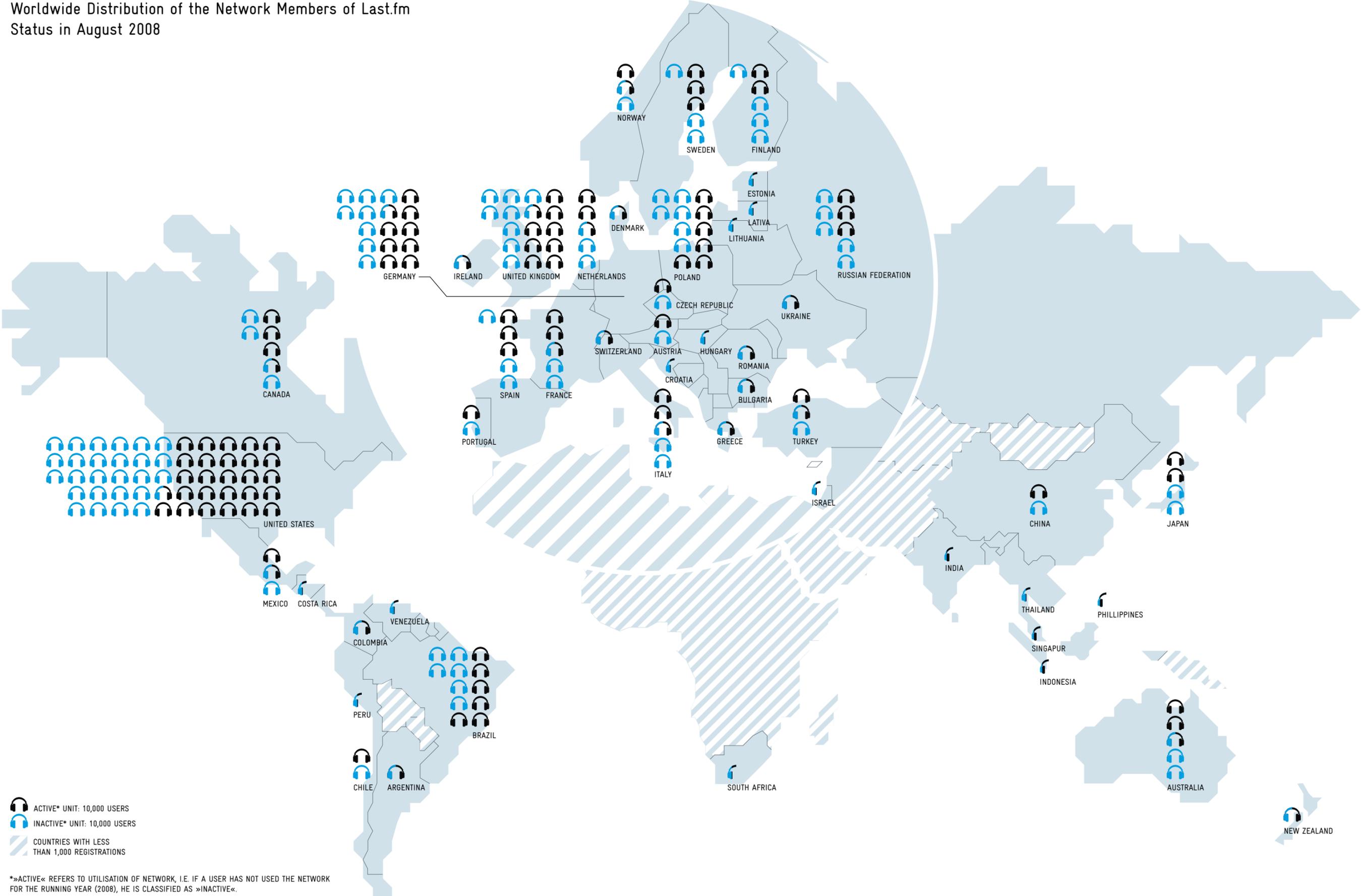
Map 3



Map 3:
After that we formed units. One headphone stands for 10,000 users. Because of the proportions in Europe we piled the headphones diagonally on top of each other.

Map 4 (next page):
Final map, showing the headphones in a row.

Worldwide Distribution of the Network Members of Last.fm
 Status in August 2008



ACTIVE* UNIT: 10,000 USERS
 INACTIVE* UNIT: 10,000 USERS
 COUNTRIES WITH LESS THAN 1,000 REGISTRATIONS

*»ACTIVE« REFERS TO UTILISATION OF NETWORK, I.E. IF A USER HAS NOT USED THE NETWORK FOR THE RUNNING YEAR (2008), HE IS CLASSIFIED AS »INACTIVE«.

Comparing Fan-Groups

#01 Question/Idea

First there were two questions: How can we describe the band-related music preference of a user group? What have the various user groups in common and what are the differences?

The Approach

Last.fm offers weekly rankings of 1,000 users out of the top-listeners of a certain band. From these rankings we raise random samples of 100 listeners each, who represent the community of listeners to the musicians we selected. Every user is visually displayed by one graphic each. The result of this is a series of 100 different graphics generated by the same algorithm, and as a group can be compared with user groups of other artists. The graphics allow conclusions about the music preference of an individual as well as of the whole group.

Realisation

By the API method »user.getTopArtists« we first gather in a text-file those 50 artists a user has mostly listened to with the Last.fm Player during the last three months. Also, for each artist the playcount* is being saved in a separate text-file. We use the artists' names for saving the three most frequent tags** of an artist by the method »artist.getTopTags«. These tags are then being sorted according to groups and quantities, not depending on an artist, in order to find out which tag a user listens to mostly. The result of this sorting would be saved in a text-file, as well. The five biggest genre groups together with the playcount would be used as a parameter for visualizing. This description refers to the last version of a series with several visualizing-attempts being shown on the following pages.

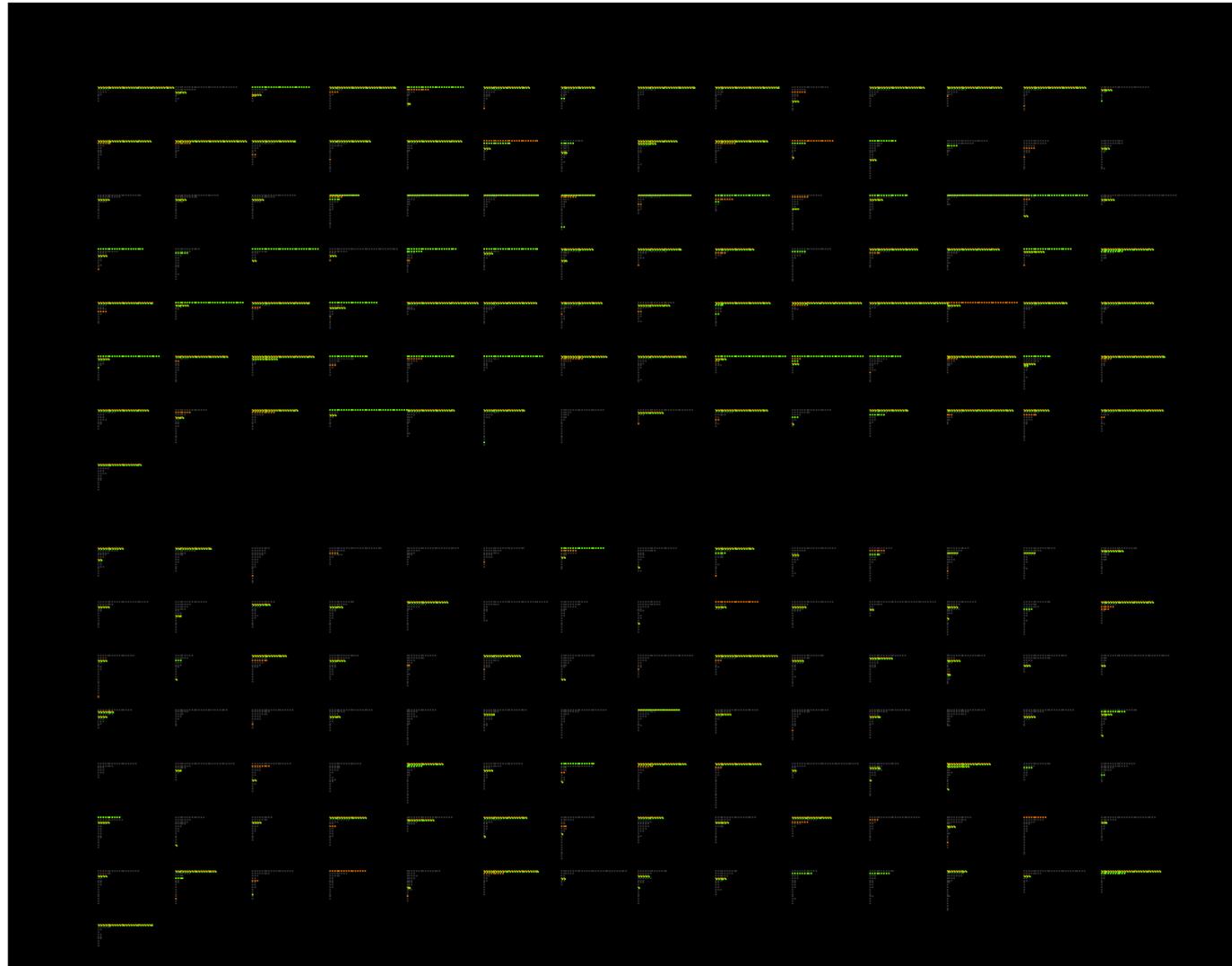
* Playcount: The playcount says how often an artist has been played on the player of a user's profile.

** Tags: The network users can share one or several tags for each artist, describing the respective artist. For this they normally use the genre group the artist's music belongs to.



These scribbles on notepads of the »Bitburger« brewery are silent witnesses for long nights that we spent in a pub during our diploma project. They testify part of our search for a visual solution to this topic scope.

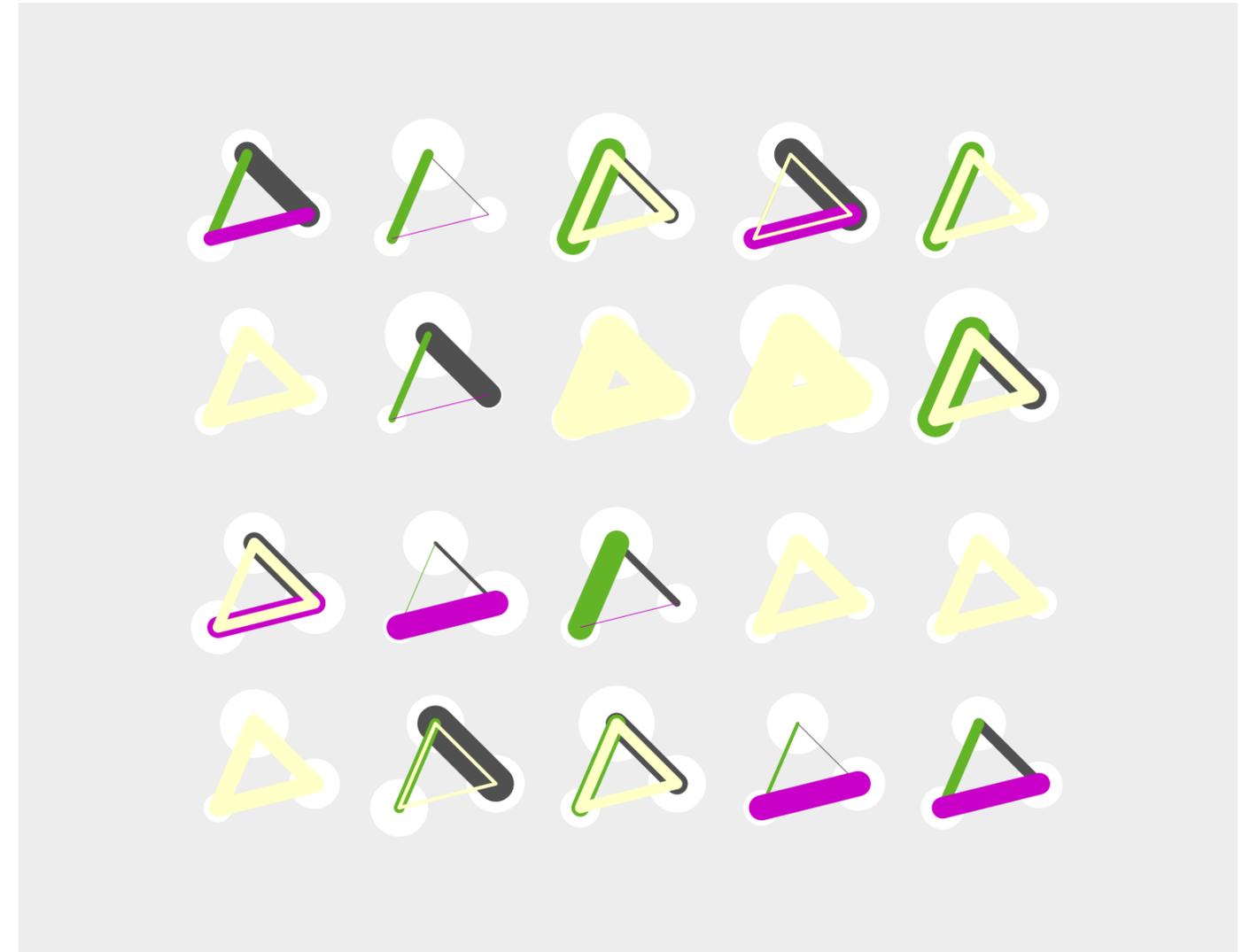
#02 First Visualisations



Graphic 1

Searching for a suitable use of form for the illustration of a user group and their music profile there were several approaches. It was a challenge to us to compare groups of users to each other and to filter out how a music profile of an individual user is built and how it differs in comparison to others. Starting from the first programmed visualisations again and again we were confronted with the difficulty of finding a solution that is graphically convincing as well as clear and understandable with regard to the

contents. During the first steps we instinctively tried to express the difference between individual music genres by colour or by classical forms as the circular diagram. Finally we abandoned this and concentrated on more precise shapes. These (shapes) were to characterize a certain music genre of a user and to make each user individual and comparable by their very different arrangements and shifting of parameters. By this we tried to »stage« a user group again and again in different ways. The



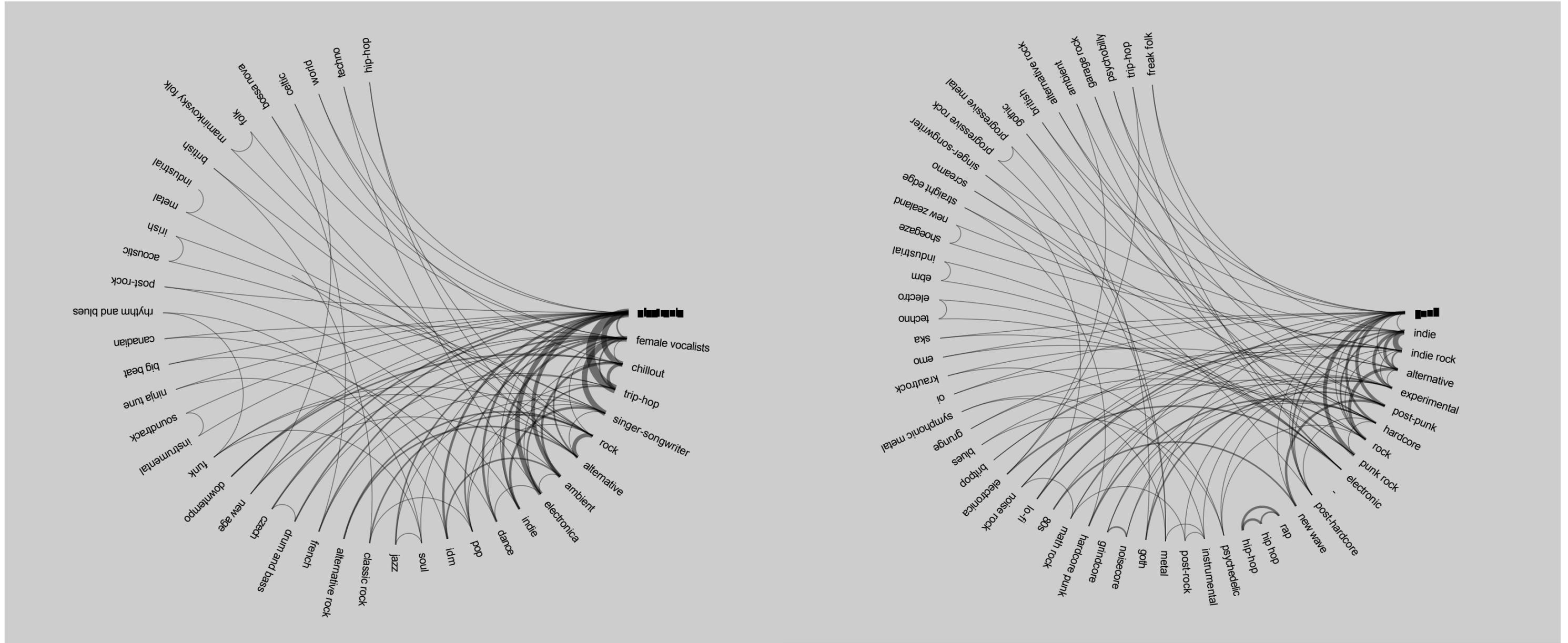
Graphic 2

following attributes and parameters of a user-profile were being at our disposal: The frequency of its played music genres, the playcount of individual artists and the combination of genres resulting from all artists played.

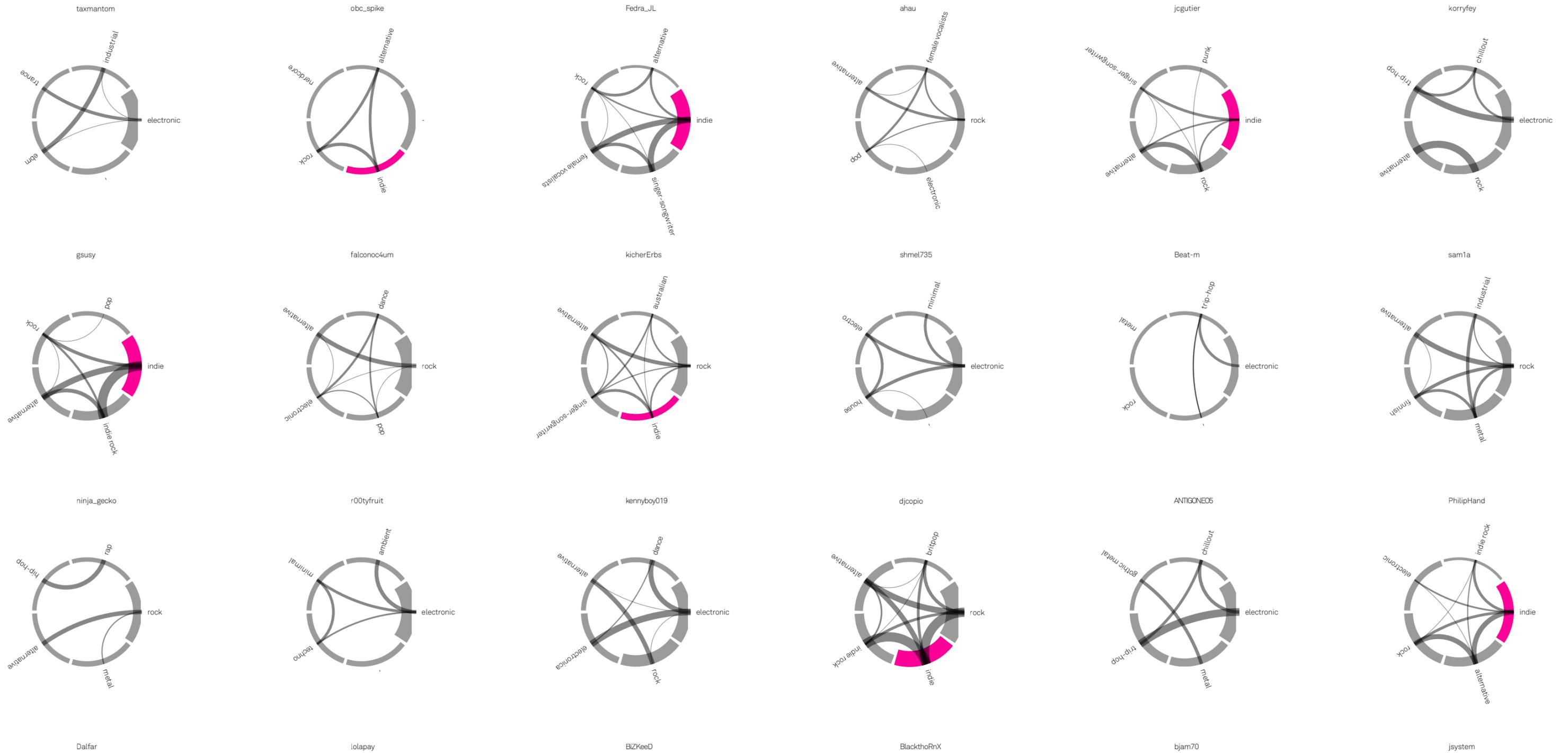
Graphic 1: This graphic was the first of more than 40 different visualizing approaches. The upper part visualizes a fan group of Radiohead the lower one a fan group of Moby. You can see that the fans of Radiohead predominantly have a one-way music preference.

Graphic 2: : This graphic shows our first trial to visualize the relationship of genres to each other.

#03 Approach Circular Diagram



For this approach we developed an algorithm by which we were able to display any number of genres of a user with their relationship to other genres. The genres that are found most frequently have the most connections to other genres. This way it can be determined if the user listens to only one style of music or to several different ones.



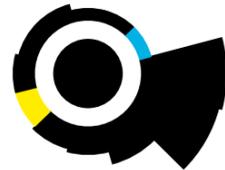
This approach is based on the same algorithm as in the preceding graphic, but here only the five most frequent genres are shown. The coloured genre is named »Independent«. With this approach the shape is »closed«.

#04 Approach Circular Diagram without Connections

starcarly14



Christel82



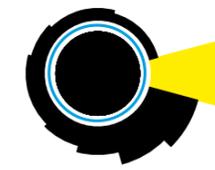
striker9



danjahandz



peibolm



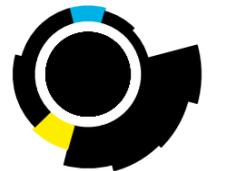
Errshey



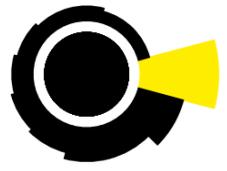
apowers69



12yosami



smplystephanie



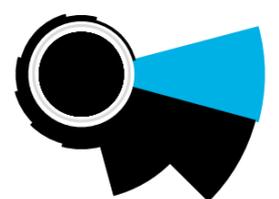
lullabum



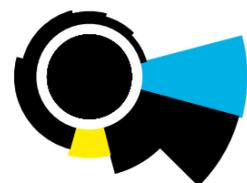
staddo



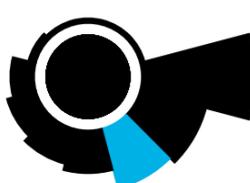
G-unitGs



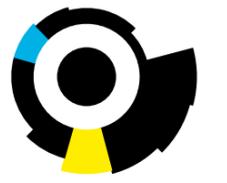
motoroller



1hh2009



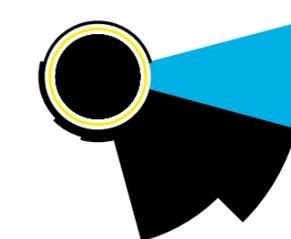
anni_bus



PiroGom



paulie69

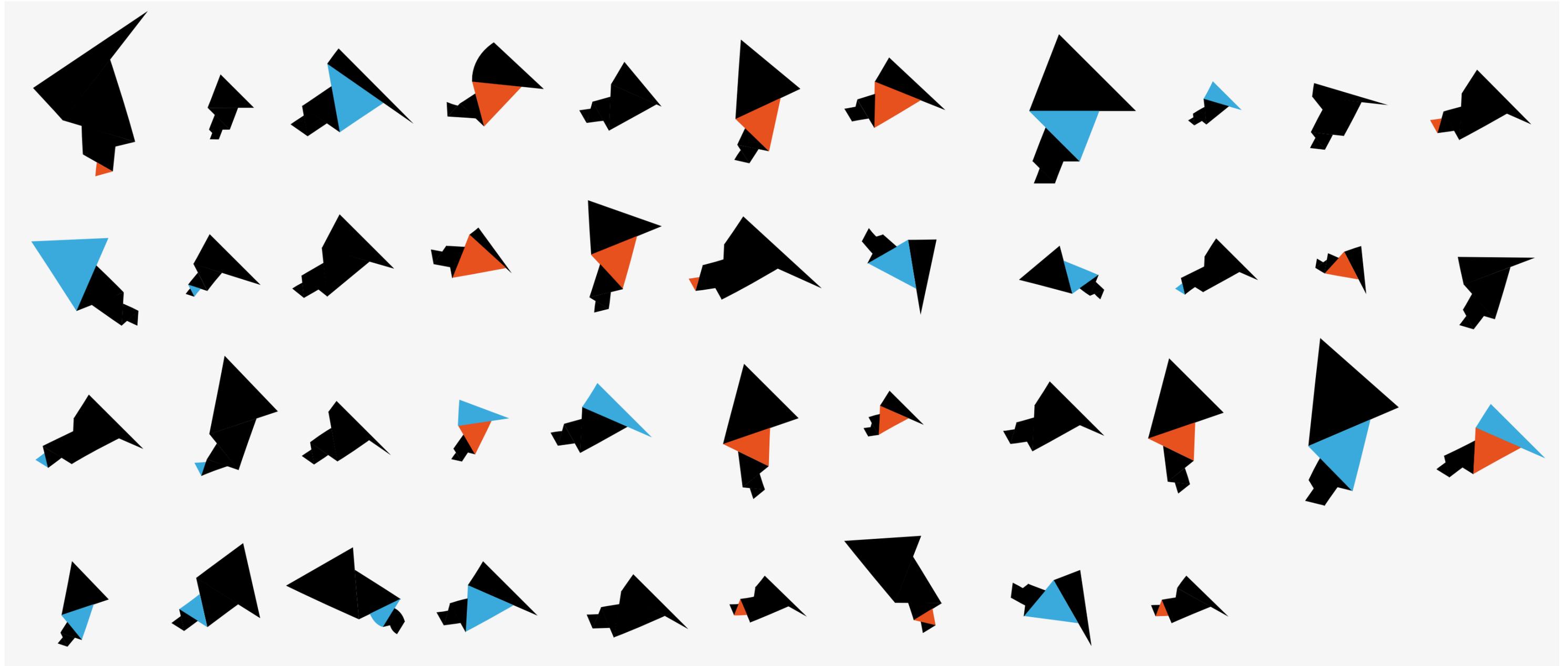


Blade555



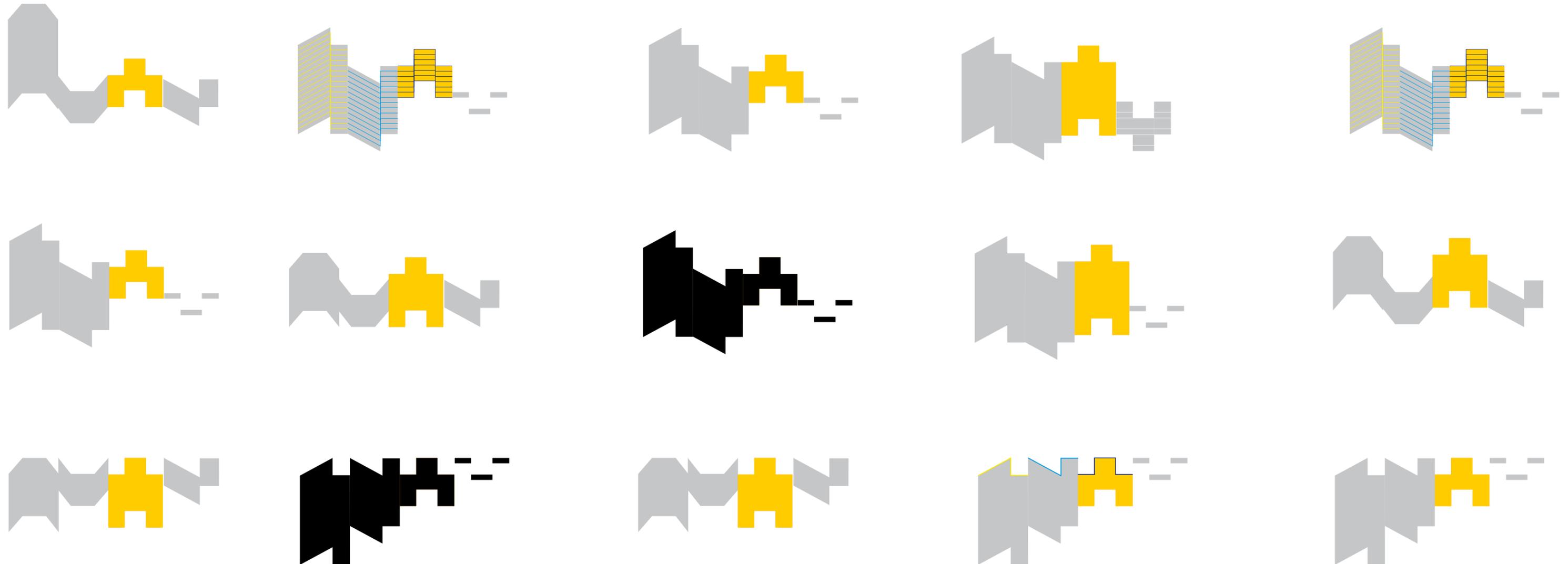
With this approach we forgot about the connecting lines between the individual genres and decided to display them with larger areas. We arranged them in a way that would give a clearer shape to the circular diagram.

#05 Approach Cochlea-Shape



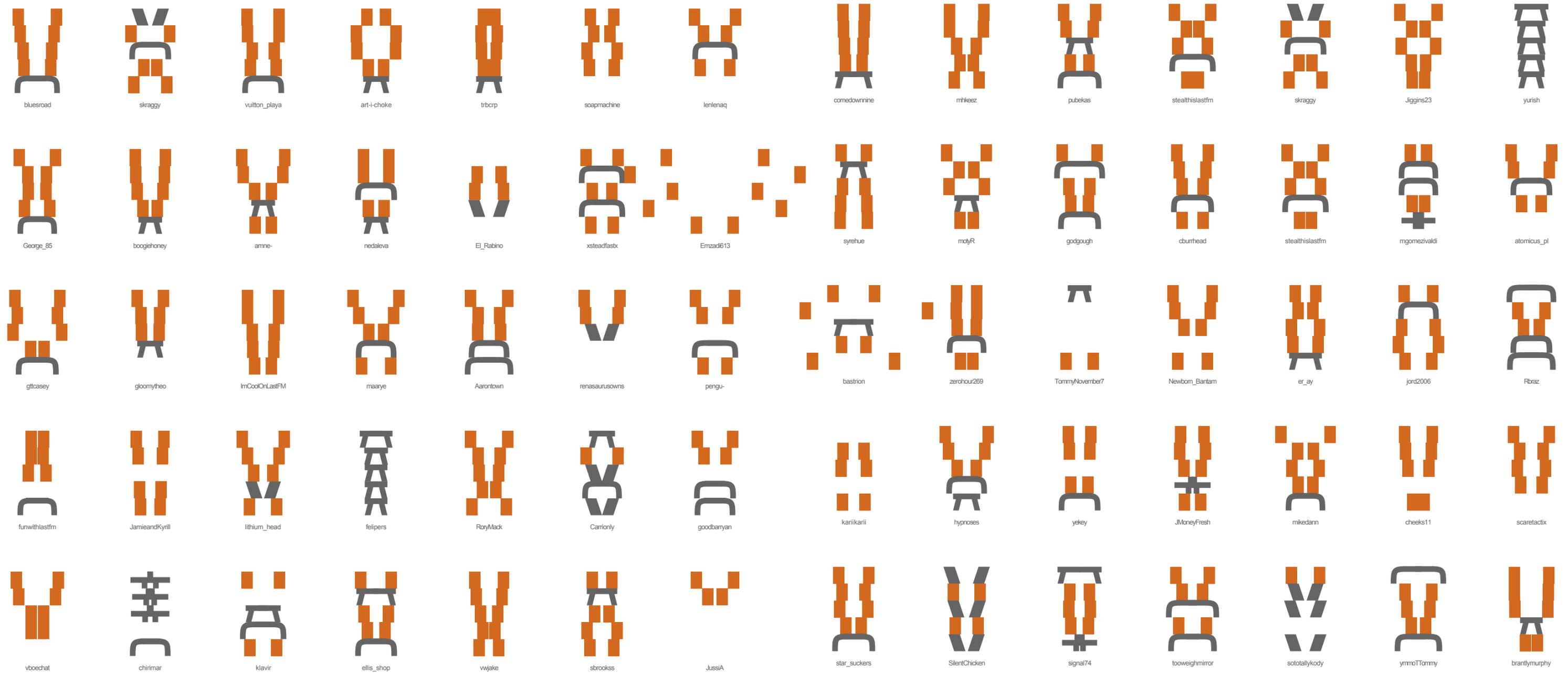
By this approach we tried to leave the more familiar graphics by arranging triangles mirror-inverted. Each triangle is representing one genre.

#06 Approach with Individual Forms of Genres



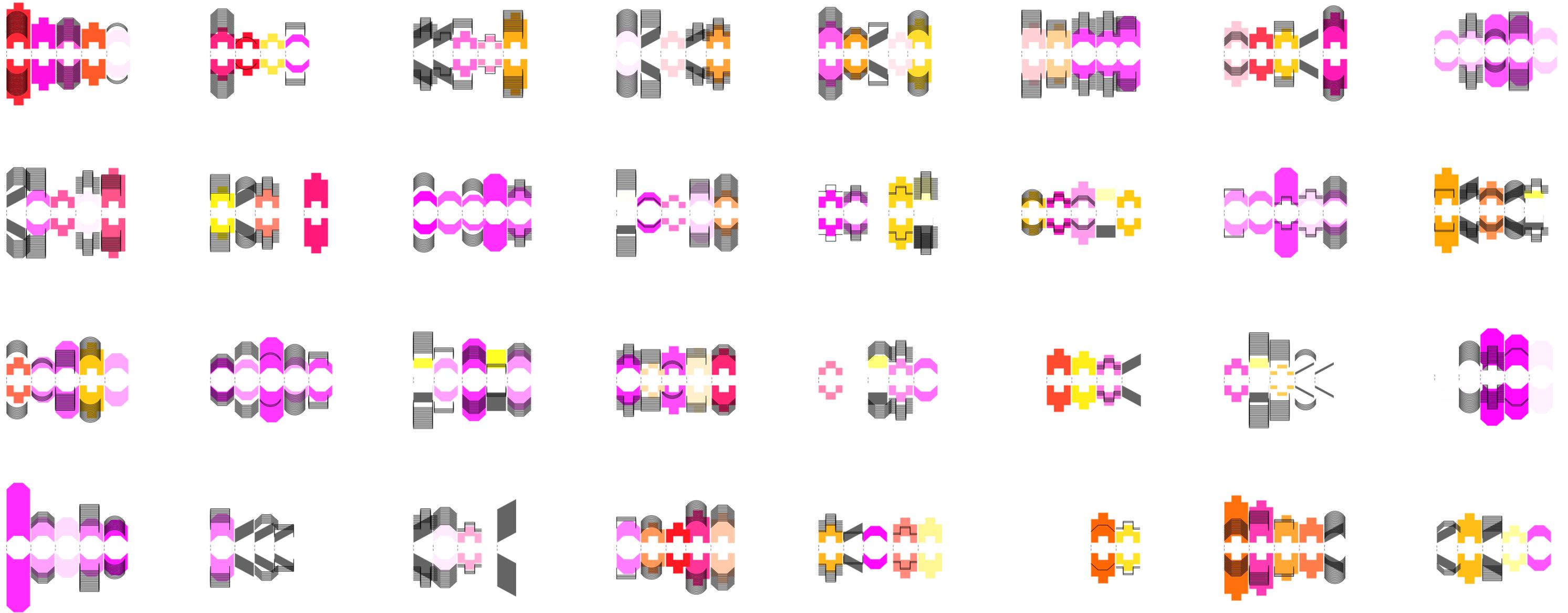
This approach arranges individual genres in a horizontal line. Here, each genre is displayed in an individual form.

#07 Approach with Mirrored Form



This approach arranges the individual genres vertically. Each genre is here displayed by an individual form. Afterwards it is being inverted.

#08 Approach with Mirrored Form and Overlay



This approach is very similar to the preceding one, but the arrangement of genres lies in a horizontal level again.

#09 Final Approach »Amplifier«

CONSTRUCTION OF AMPLIFIER

The amplitude indicates the number of artists who have been tagged with genres associated with them.

One unit is representing one artists. The thickness results from how often an artist has been played by the corresponding user-profile.

Username

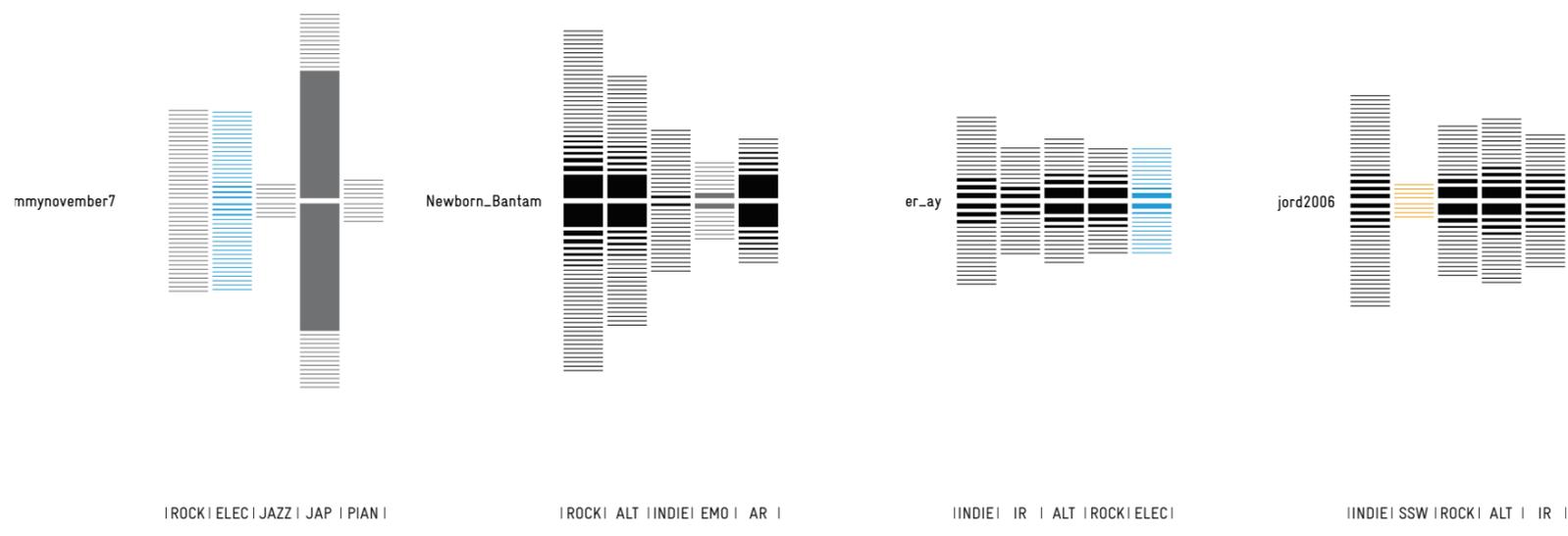
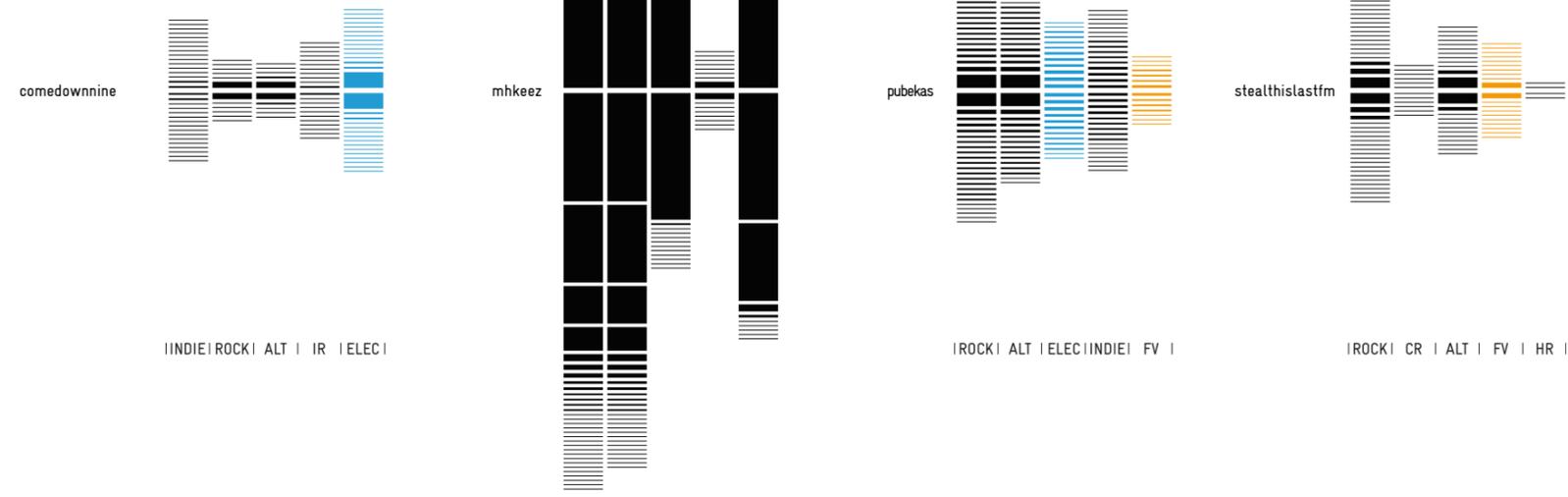
vw jake

The individual categories of genres are encoded by colours.

The five genres most frequently appearing in the user-profile are shown in a row.

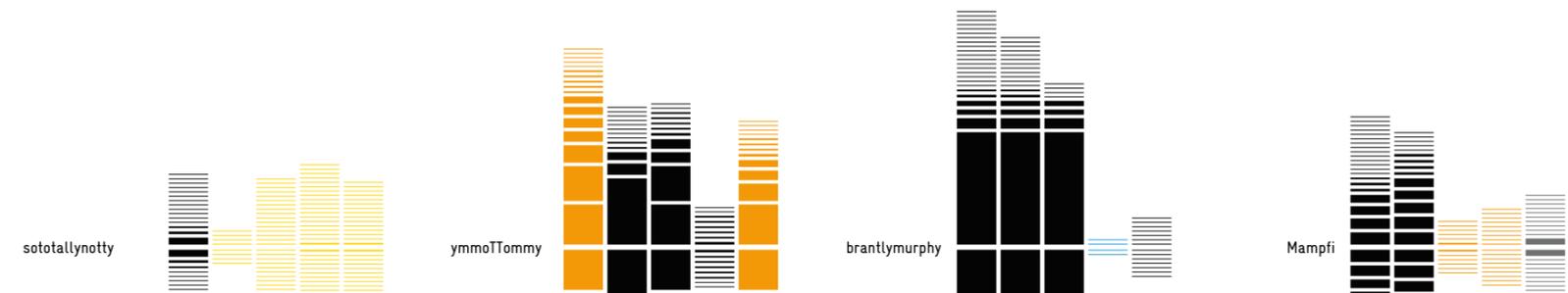
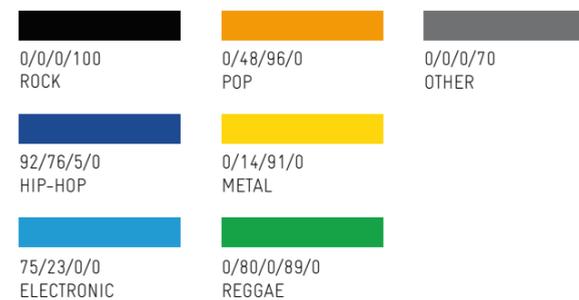
| ME | DR | GE | FW | DT |

Abbreviation and names of a genres resp. sub-genres



Music-Genres

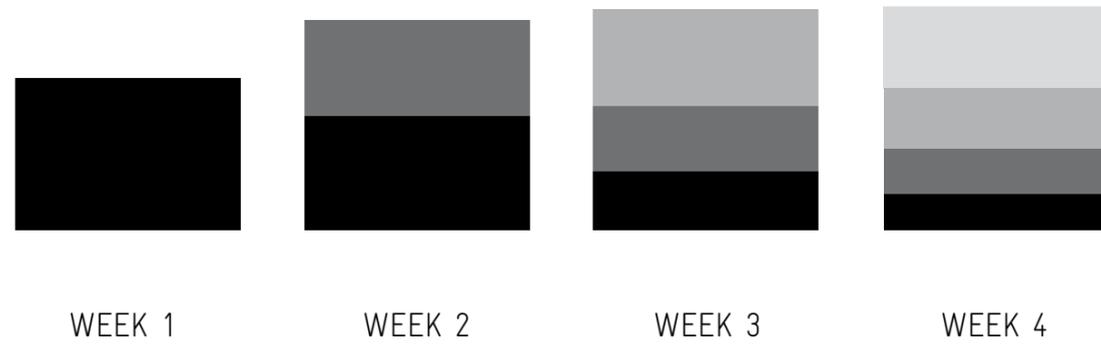
For our topic scope »Comparing Fan-Groups« we formulated categories for all appearing styles of music in order to faster relate the user to a certain music preference. For choosing the colours we orientated ourselves to the above categories as well as their proportions within a fan-group. Within the topic scope »Cumulation of Genres« we proceeded in the same way, with the difference that the shade of colours had to be lightly modified, due to the dark background of the interactive application.



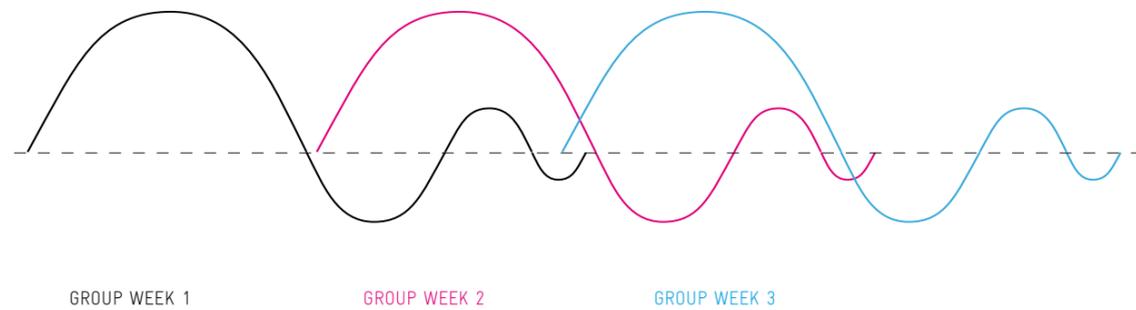
Fluctuation of Fans

#01 Idea Development

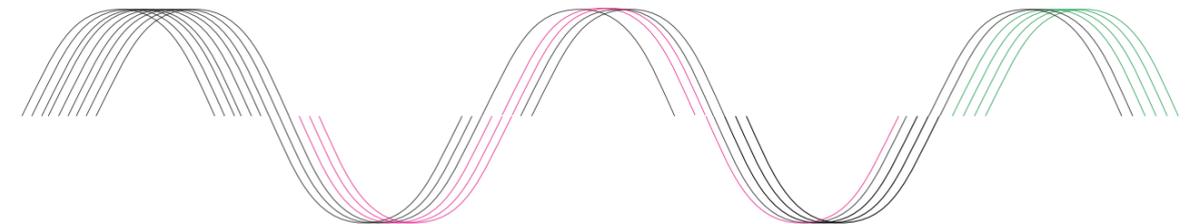
Step 1



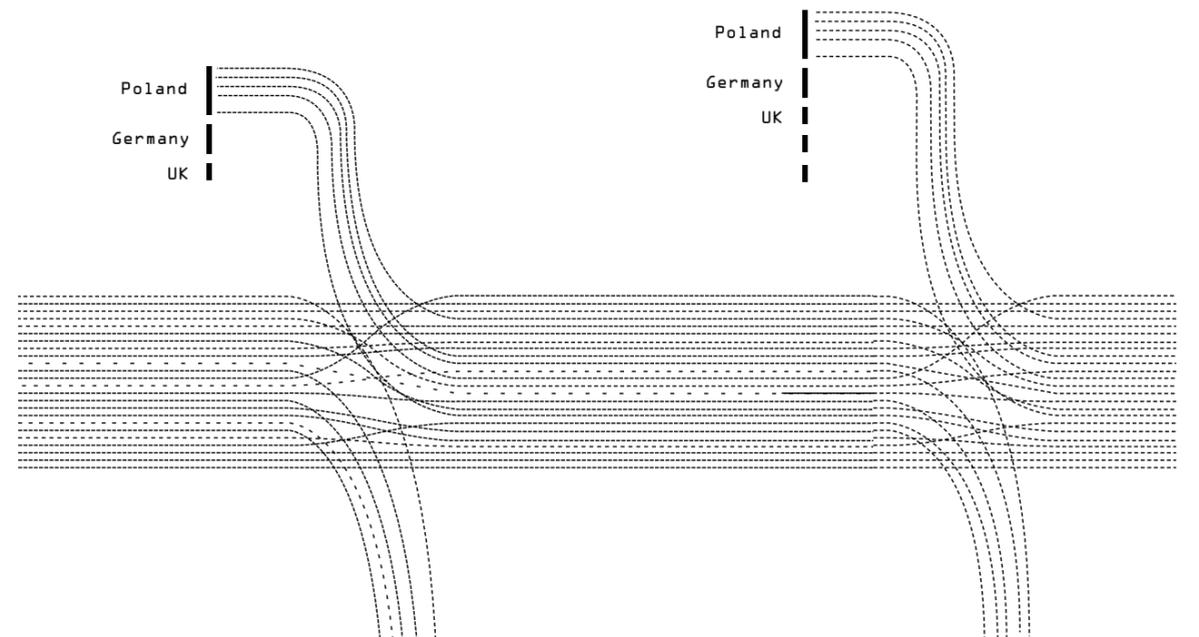
Step 2



Step 3



Step 4



In this scope we tried to prove that there is a relationship between an artist's tour and the network users mostly listening to his music. We presumed a growing share of users in a country within the 1,000 »top-listeners« of an artist, after a performance in that country. As a starting point for the visual approach we took among others the principle of the sinus curve, which in a widest sense visualizes a circular movement. This seemed to be very suitable for visualizing the fluctuation within this group of

listeners captured weekly. From each user's country and ranking we determined a ranking of countries together with a corresponding proportion of users.

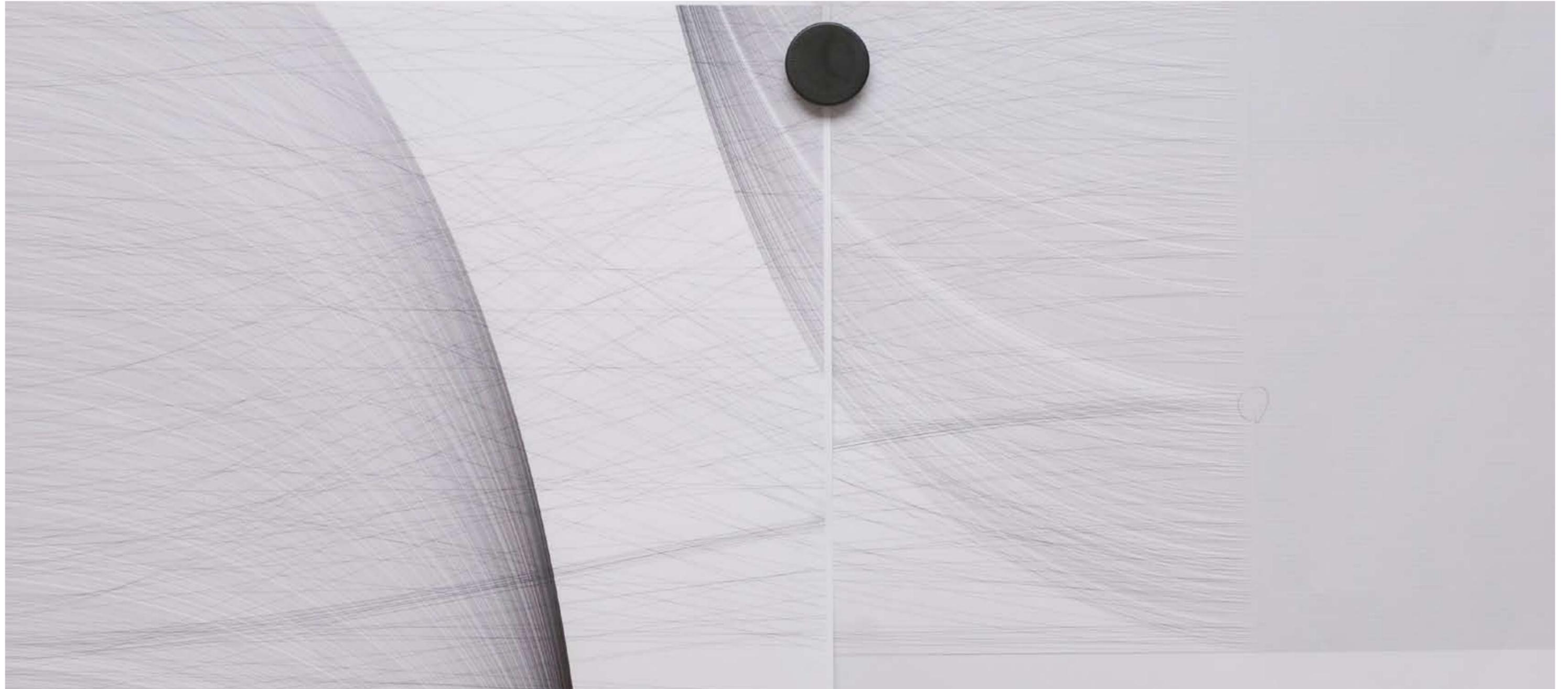
Step 1: This graphic shows what actually happens among others with the investigated issue. The differently coloured groups reduce from week to week.

Step 2: We then interpreted this observation as a sinus curve slowly flowing out.

Step 3: Individual users are visualized by a line. If a user is no more to be found among the 1,000 »top-listeners« the user-line ends at the mean line.

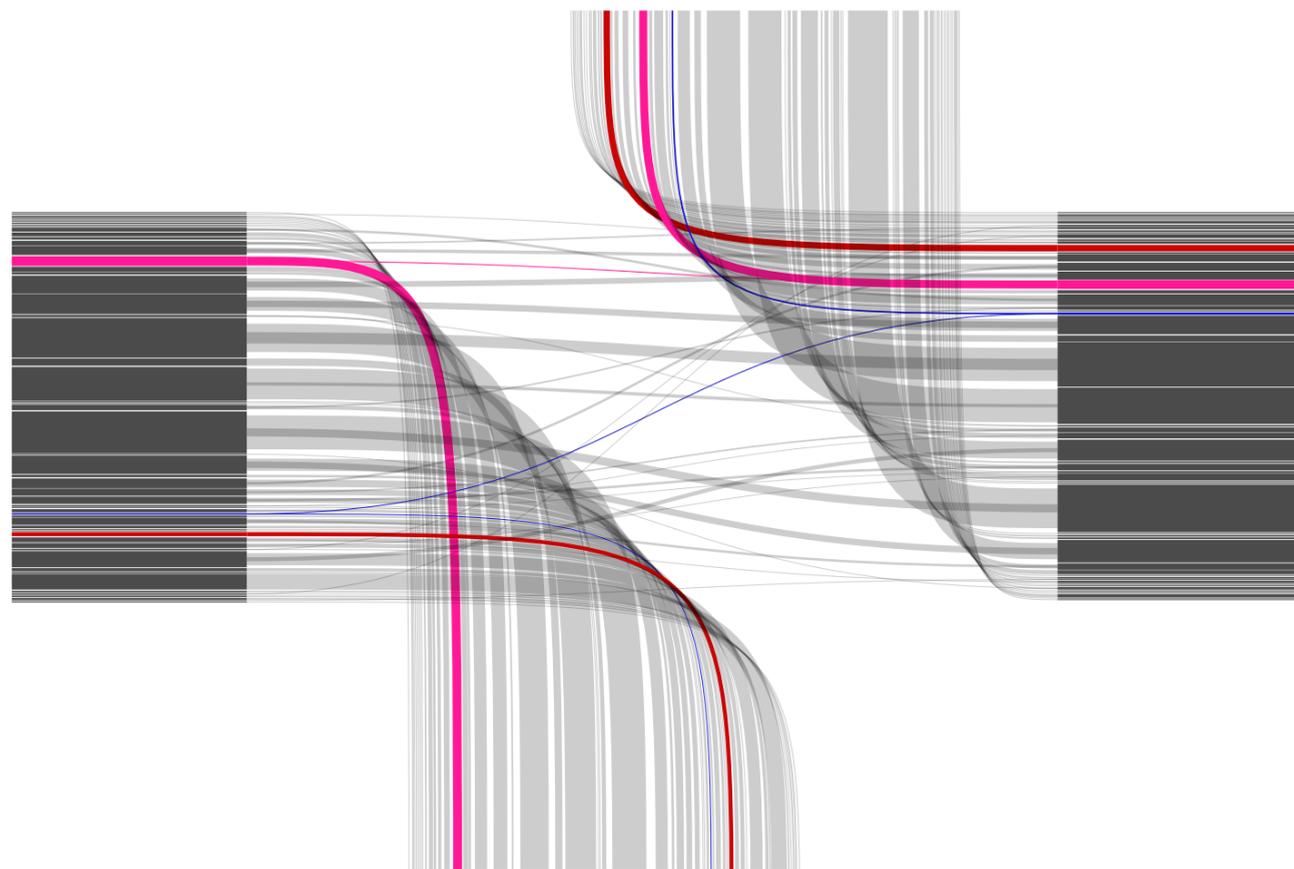
Step 4: Lines that stopped before now »leave« the graphic. Moreover, the newly arriving users »flow« into the diagram by the lines coming by from above.

#02 First Realisation



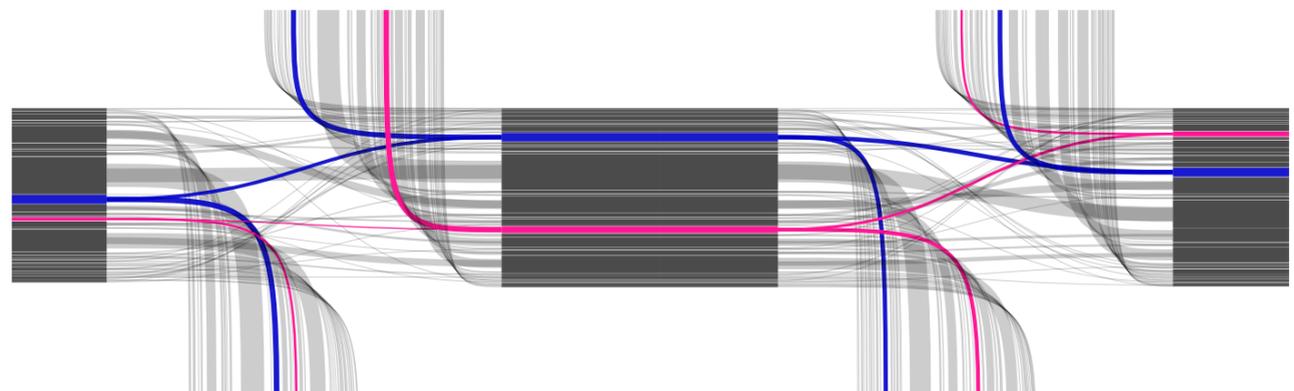
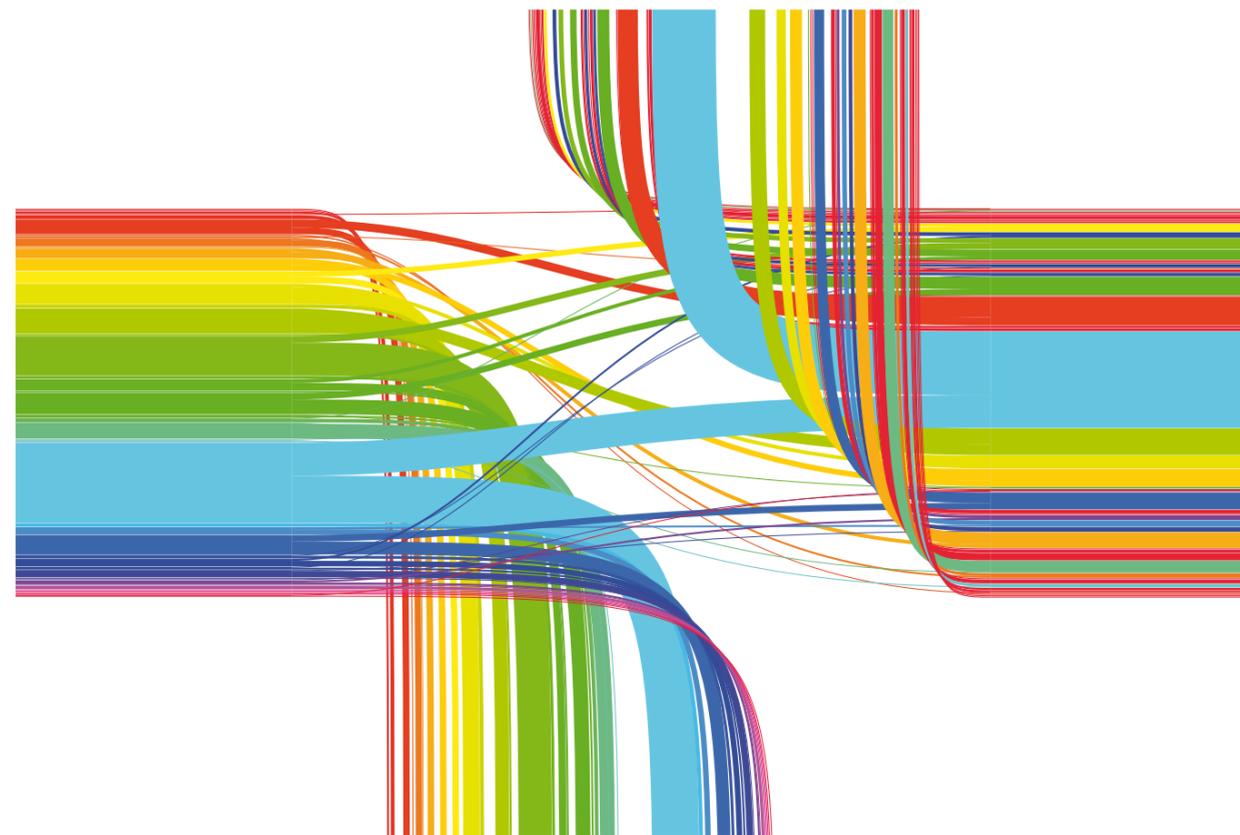
It was one of the first attempts to visualize each user by an individual line. But this did not produce a clear picture of the issue.

#03 Finalizing the Graphic



Graphic 1

Graphic 3



Graphic 2

In the algorithm, producing the final graphic, the 1,000 users are being co-ordinated to countries. The vertical position of a stripe representing a country is obtained from the positions of the listeners pertinent to it. Thus it can be that there is a relatively thin stripe in an upper position because the pertinent users are found in the first places within the 1,000 »top-listeners«.

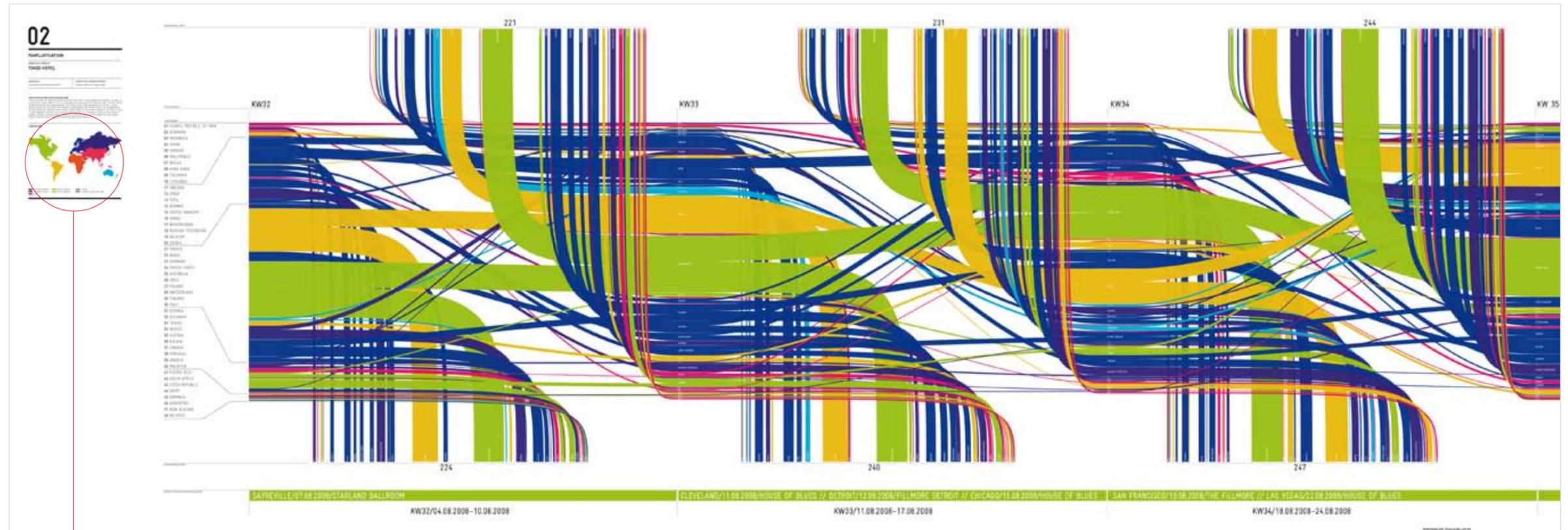
Graphic 1: In this graphic the user-groups from Russia, Iceland

and Japan are coloured. The changes of the positions can be noted clearly.

Graphic 2: This graphic consists of two »knots«, and thereby it shows the fluctuation within 3 data captures.

Graphic 3: Differentiation of all countries by colour, using the complete HSB colour spectrum.

#04 Final Poster and Colour-Coding



92/100/7/0	0/90/55/0	11/26/95/0
100/91/2/0	0/80/94/0	48/0/97/0
80/5/10/0		

For our topic scopes »Fluctuation of Fans« and »Album-Release« we developed a colour-coding according to continents and divided Europe into East and West. Russia within this context belongs to Eastern Europe.

We tried to tune the colours complementary to each other and give a »warm« shade to continents with a warm climate.

WEEK 33

DENMARK
OMAN
IRAN, ISLAMIC REPUBLIC OF
PORTUGAL
TAIWAN
PERU

BULGARIA
REUNION
BELGIUM

SWEDEN

POLAND

COLOMBIA

SPAIN

ITALY

FRANCE
NEW ZEALAND

AUSTRALIA

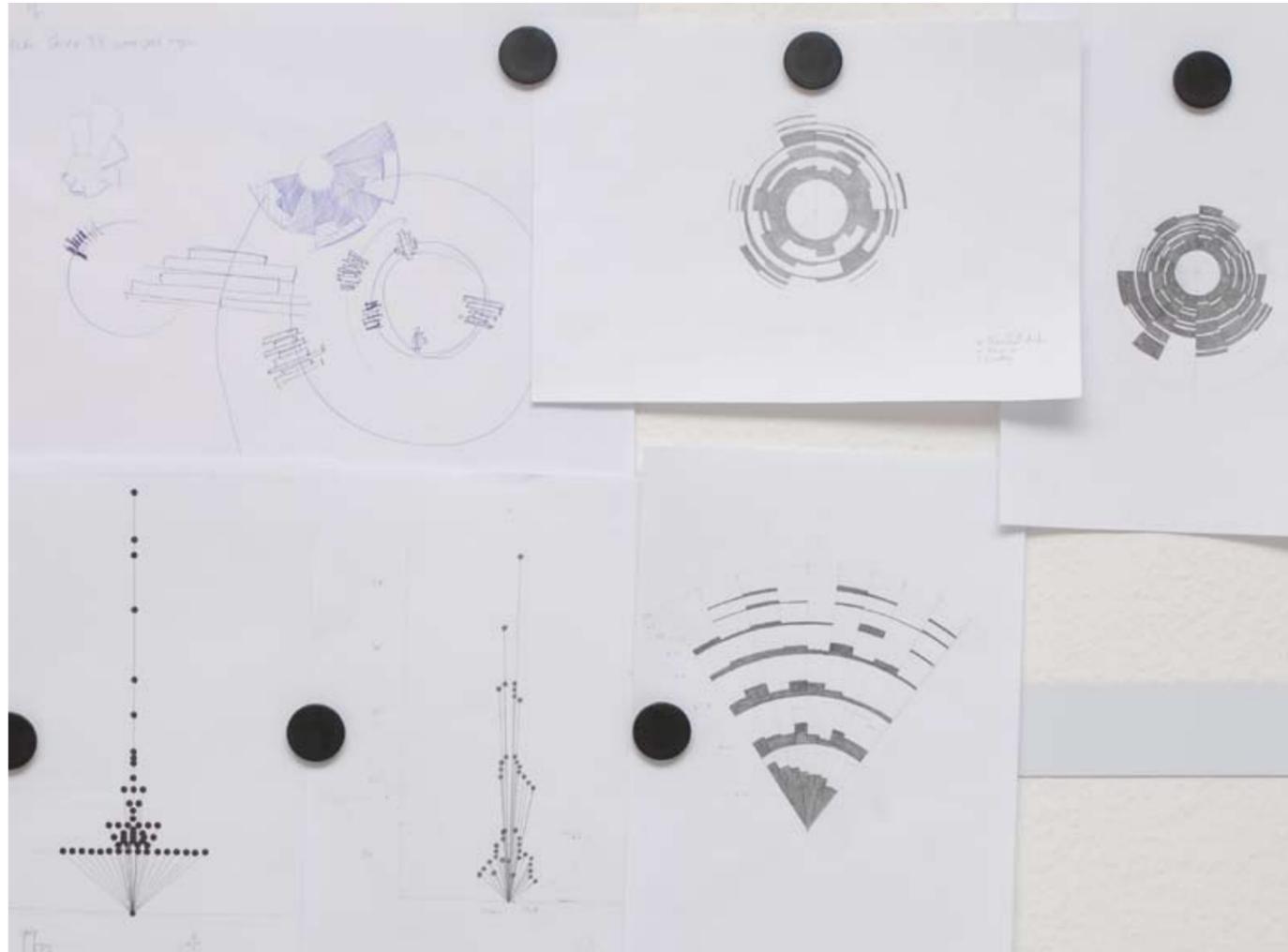
BRAZIL

INDONESIA
LITHUANIA



Album-Release

#01 First Scribbles

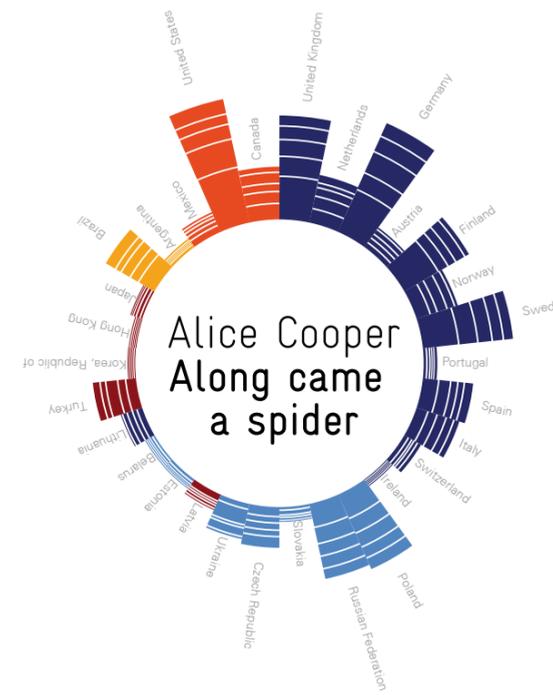


How successfully does an album spread after its release on Last.fm? How many users are being reached within a certain period? Starting from these questions, we tried to get conclusions as to where (which countries) an artist is or is not successful with his new album. For shortly after its official release the new album would be published on Last.fm as far as the artist has got a Last.fm profile. Here, too, we are making use of the weekly ranking of 1,000 users having heard the album mostly and appearing on index-sites by Last.fm. After the publication every week we captured the ranking of the 1,000 users and sorted them according to the countries they belonged to. From this you can conclude in which

countries after each week the largest increase of listeners took place. During the period of realisation we tried to visually describe the phenomenon of dispersion that applies to this issue (album-release). In the final result we cut a circle into individual sectors, each standing for a country. The weeks that have past since the publication on Last.fm »run« as rings from the center outwards. After each ring the new number of users is indicated by little rectangles, and now we can see how many new album listeners come by in each country every week. Hence it can be concluded if the album is spreading faster in one country than in another.

#02 First Realisation

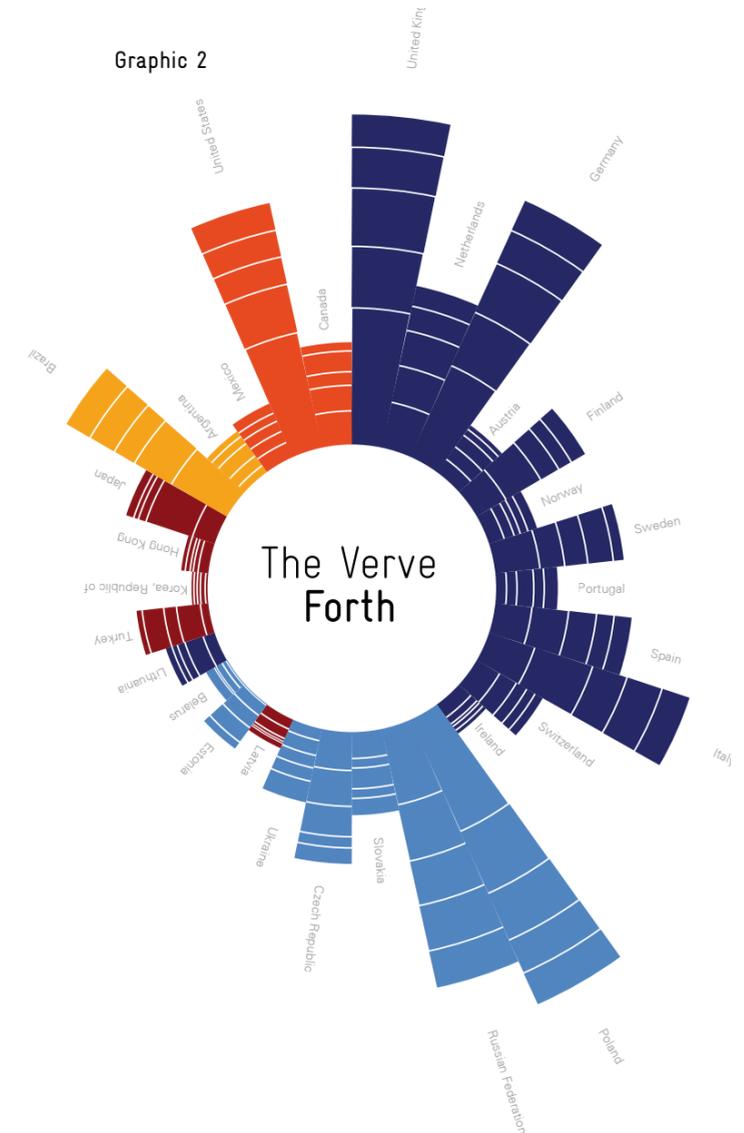
Graphic 1



Dispersion: The system of the circular diagram holds the advantage of using sectors allowing a lot to arrange. These graphics, however, do not allow to see the weekly intervalls of dispersion. The further examples (see next pages) do allow this. We also clearly see, as well, the difference between the units of area and several rectangles that represent the share of new users for each country.

Graphic 1:
The dispersion of the new album »Along came a spider« by Alice Cooper. The weeks are not yet comparable here. In comparison to others this album does not seem to be particularly successful.

Graphic 2

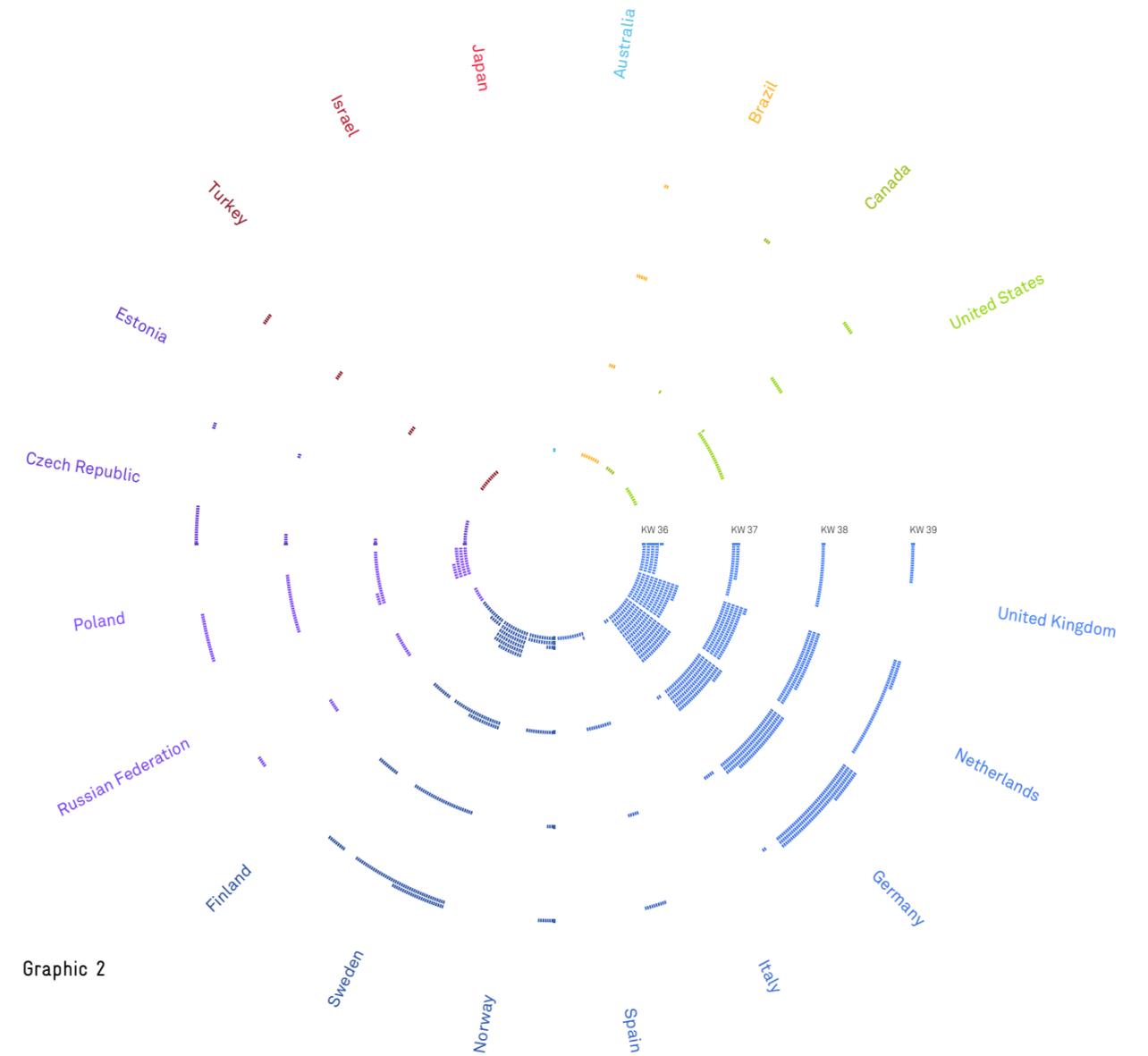


Graphic 2:
The new album »Forth« by The Verve succeeded a lot in Western and Eastern Europe.

#03 Finalizing the Graphic



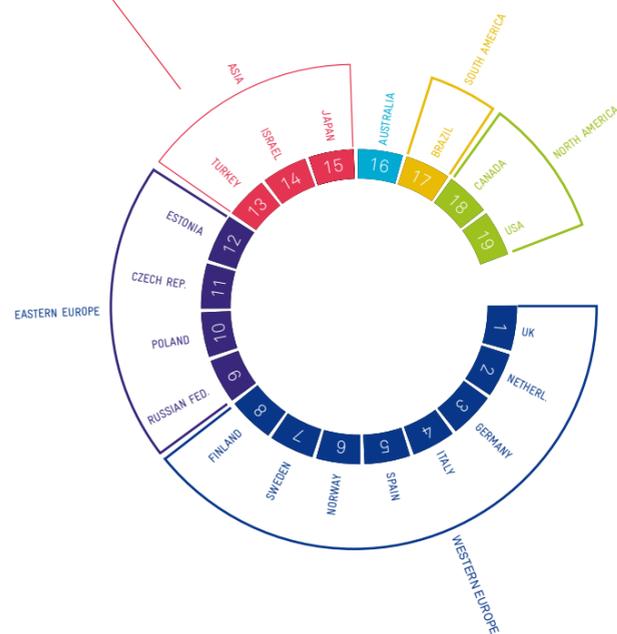
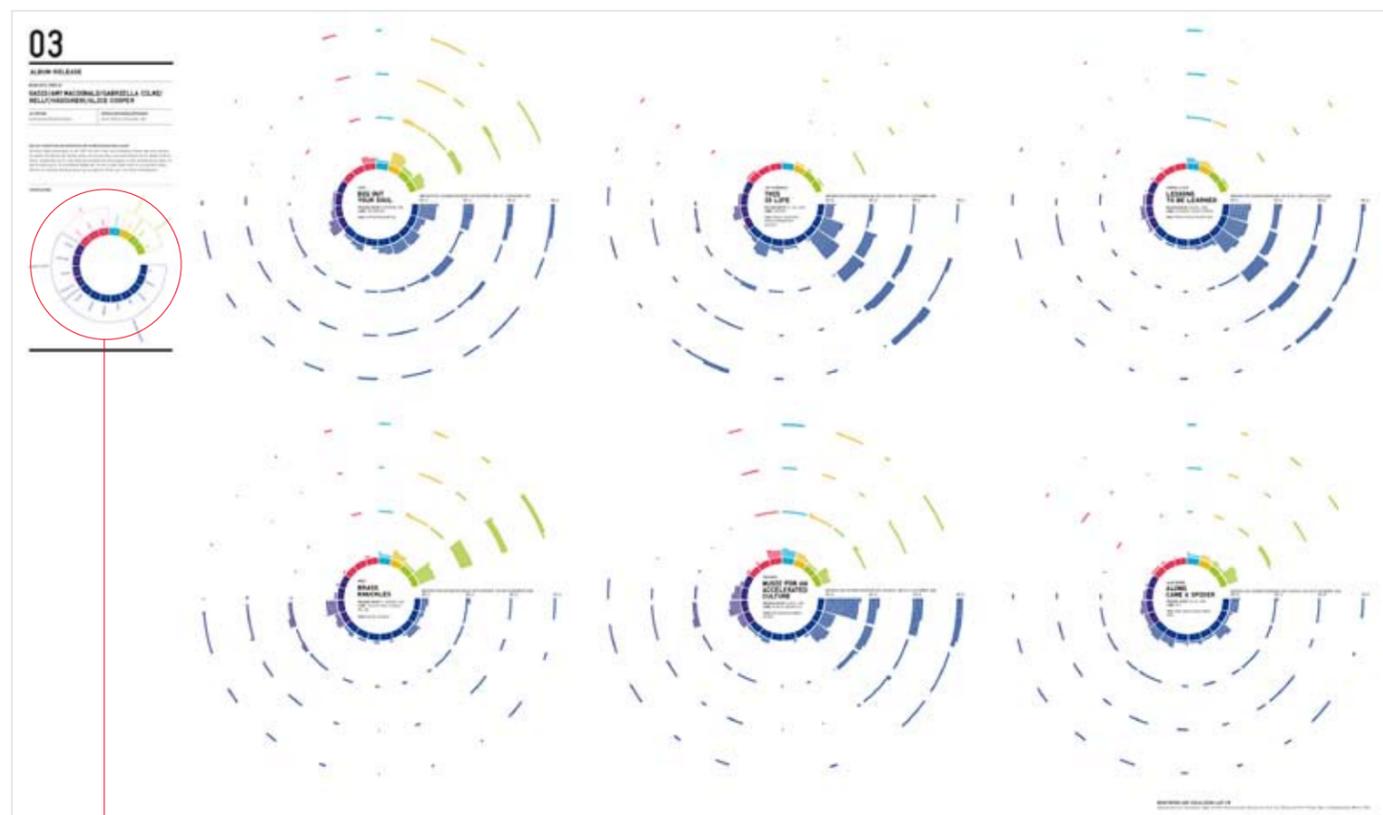
Graphic 1



Graphic 2

Graphic 1 and Graphic 2:
Those graphics are based on the same principle but an additional line in graphic 1 emphasises the weekly splitting.
Additionally, the areas of graphic 2 are being divided into units of rectangles: one unit is one user.

#04 Poster and Colour-Coding

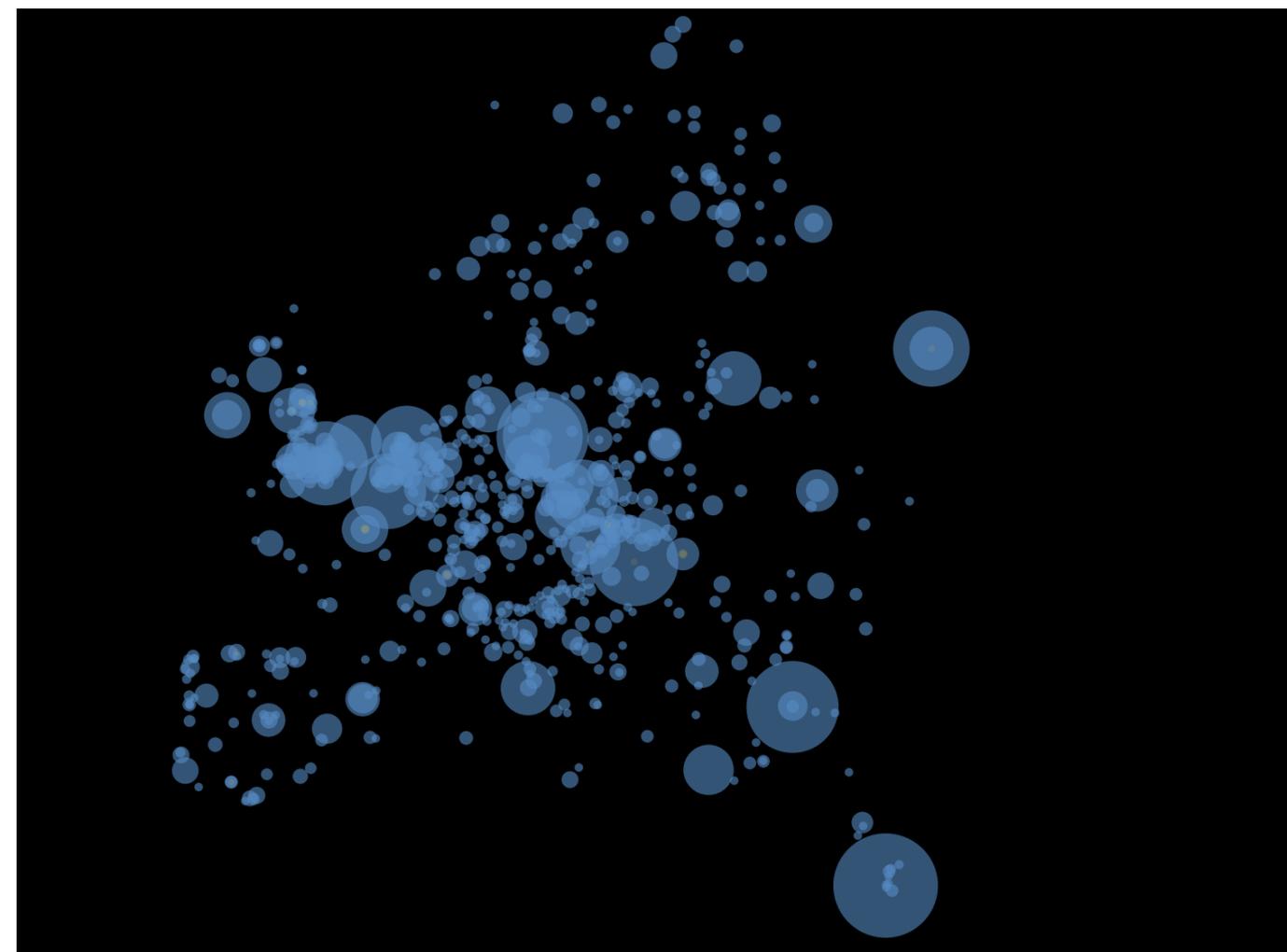
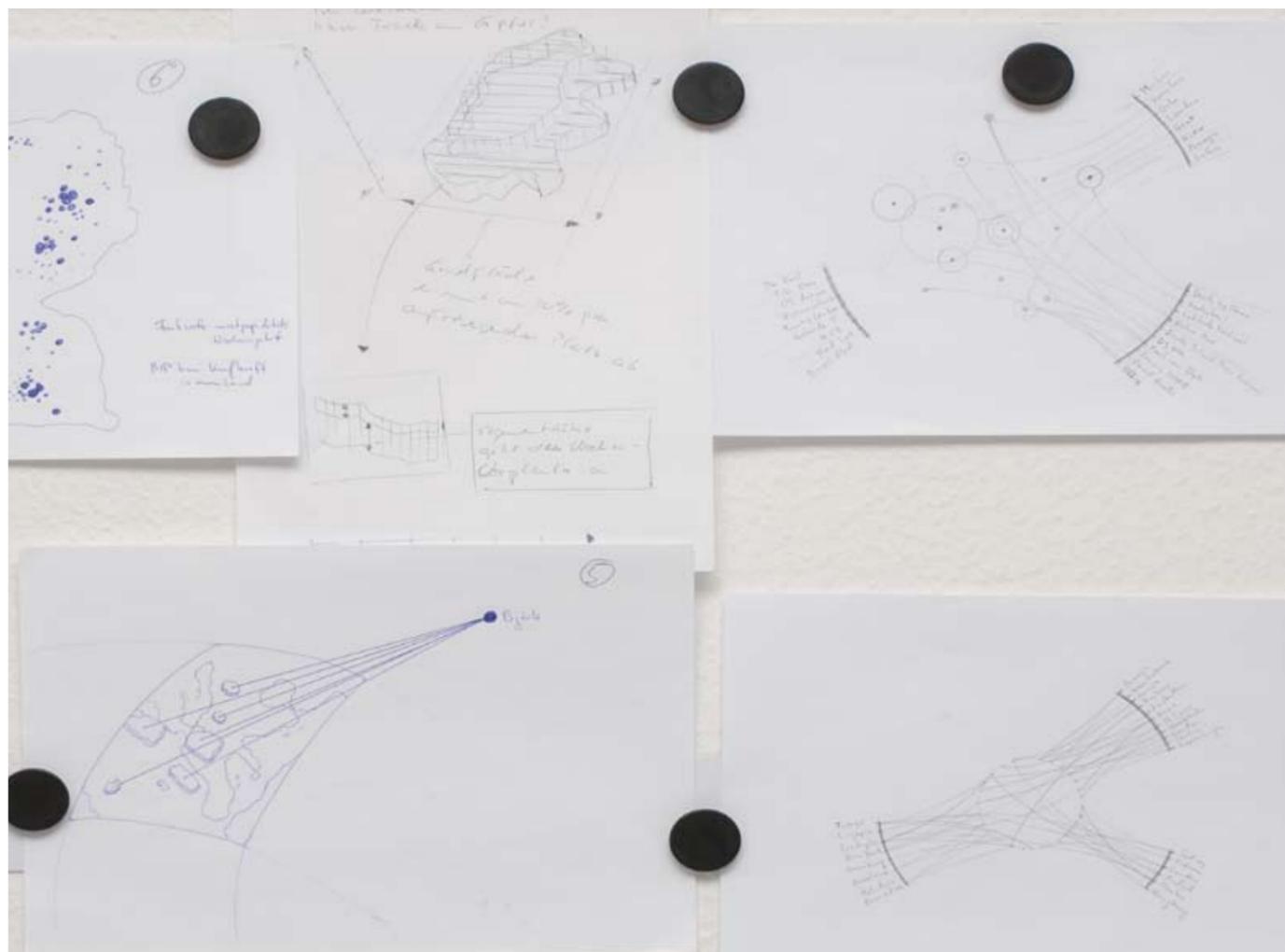


The colour-coding of each sector is based on the same principle as in topic scope 2. In each diagram the different countries are placed at the same position.



Cumulation of Genres

#01 Question/Idea



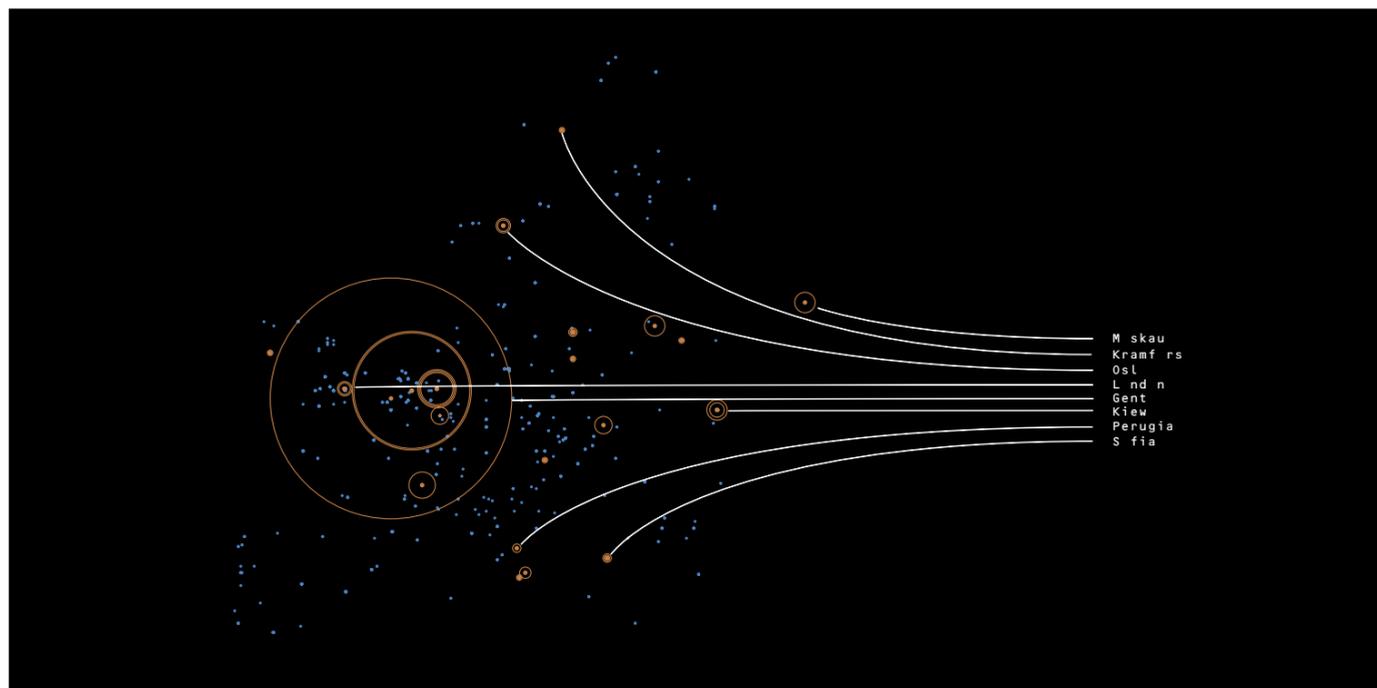
We wanted to find out where in the world e.g. »Metal« or »Electronic« are in trend. So, for a period of four months, we first collected all worldwide concert data being registered with Last.fm. Through the Last.fm application programming interface (API) and by the command »geo.getEvents« we got to xml-data-files, containing, besides the artists as headliners, the places and dates, the titles and coordinates as well as the complete lineups of concert performances. So, using the coordinates, we then projected all performances on a map indicating the borders of

countries and continents. For this we chose a projection based on the so-called Mercator formula, as this appeared to us most suitable because of its extremely low perspective distortion of the relevant parts of the world. In order to be able to more precisely localize particular concerts at the same place of performance we tipped over our projection in a 3-dimensional space, and »piled« the number of the concerts one upon another in the form of cubes. By this, the new concert scenery receives the impression of a skyline inviting for further exploration. We decided to elaborate

this to an interactive level, and by means of an application make it empirically perceptible for the user. He is to autonomously regulate distance and perspective in the 3-dimensional space and to have the possibility of finding information about concerts or genres of music himself.

Graphic: By the first mapping of the coordinates, using the Mercator formula, we could see how our concert data acted. Besides figuring the European continent, we could already realize where areas of concentration of certain genres of music appeared, as well as the volume of particular concert performances. Yet, still there was the problem of exactly localizing countries, towns and concerts.

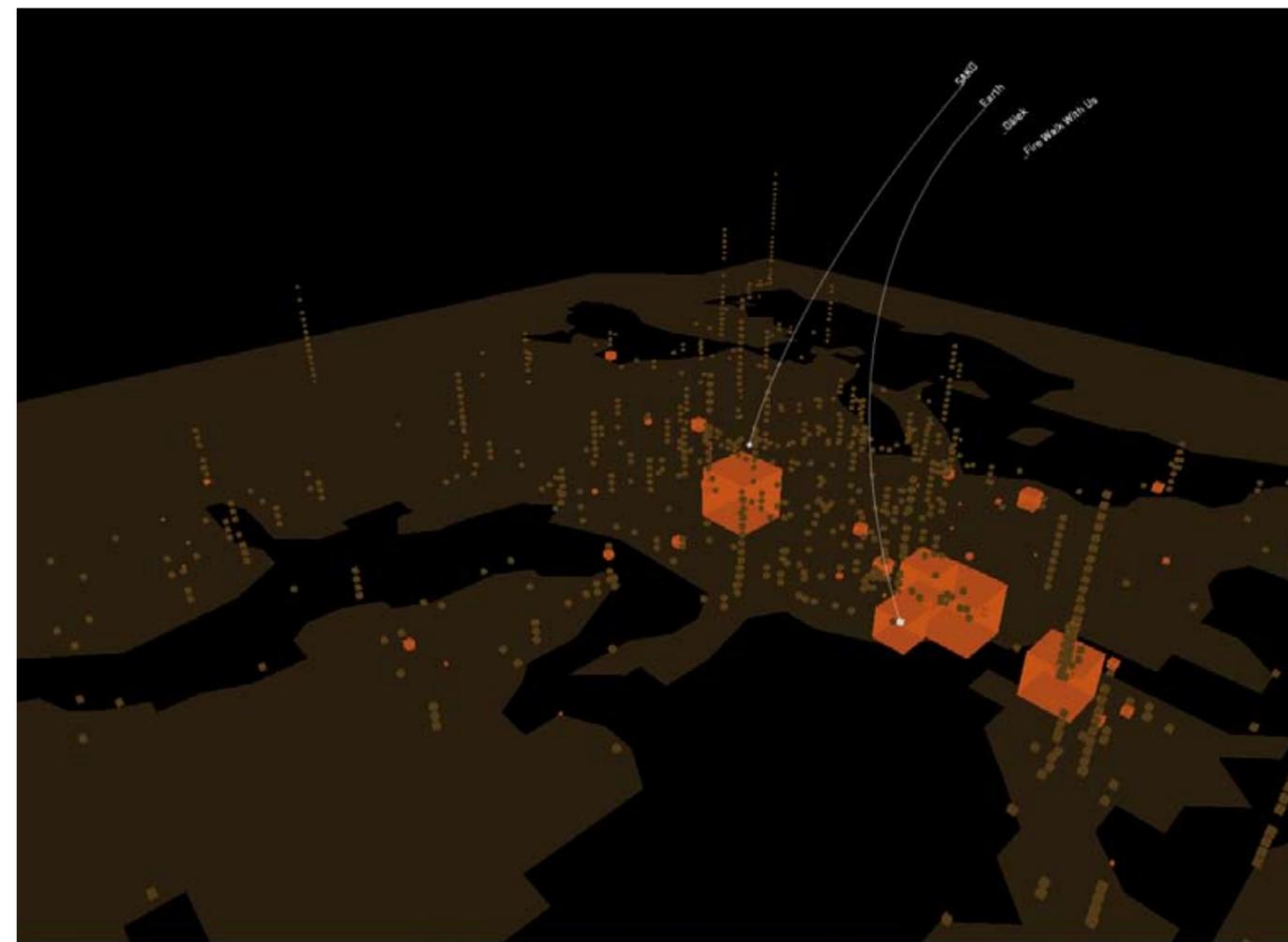
#02 2D and 3D



First test for a typographic solution



Interactive test of combining the world map with connecting lines of an circular chart

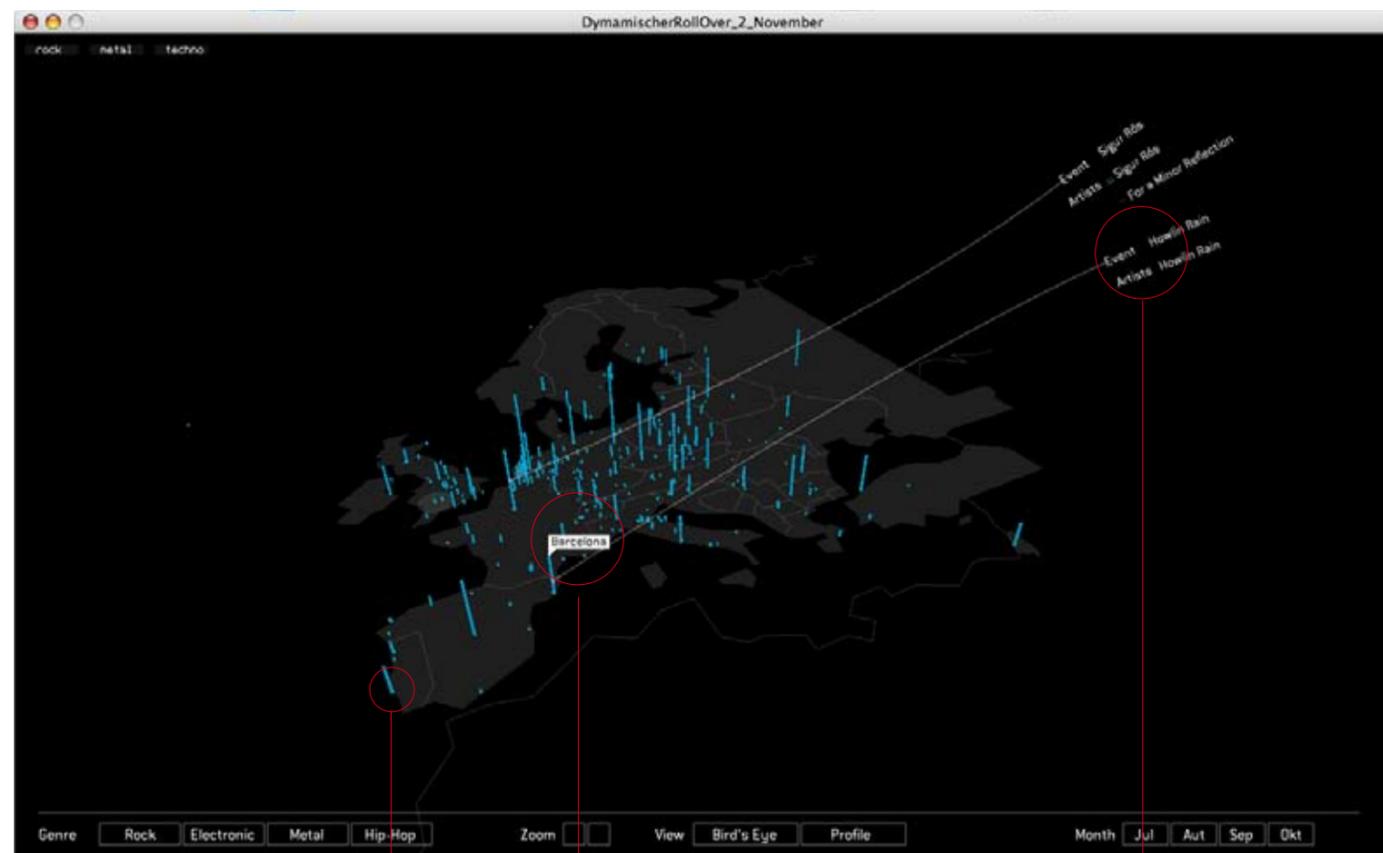


First test of showing the proportions of concerts. In this example the precise localizing has failed.

Transferring the projection into a 3-dimensional graphic makes it now easier to localize individual places of events. The size of the »piles« of concerts in the form of little cubes allows conclusions as to the number of concerts, at one point of the coordinates. The locations may now be compared with each other, and in an interactive way the needed information can be indicated in a 2-dimensional form of a circle. Since this is a matter of interactive application we were at this point facing the question of the operability for the user. While, looking for music genres he keeps the view over all his collected data and their locations by means

of the connecting lines. The alternating switch between the 3-dimensional projection of concerts and the 2-dimensional circular arrangement of their data inclusive their connecting lines enables the user to keep the view over his collected information and their origin. Apart from this, the user has the possibility of having indicated the tour-routes of particular artists and of tracing them back, as well. This enables the user to trace up the countries and towns that are or have been preferred by bands or artists on their tours.

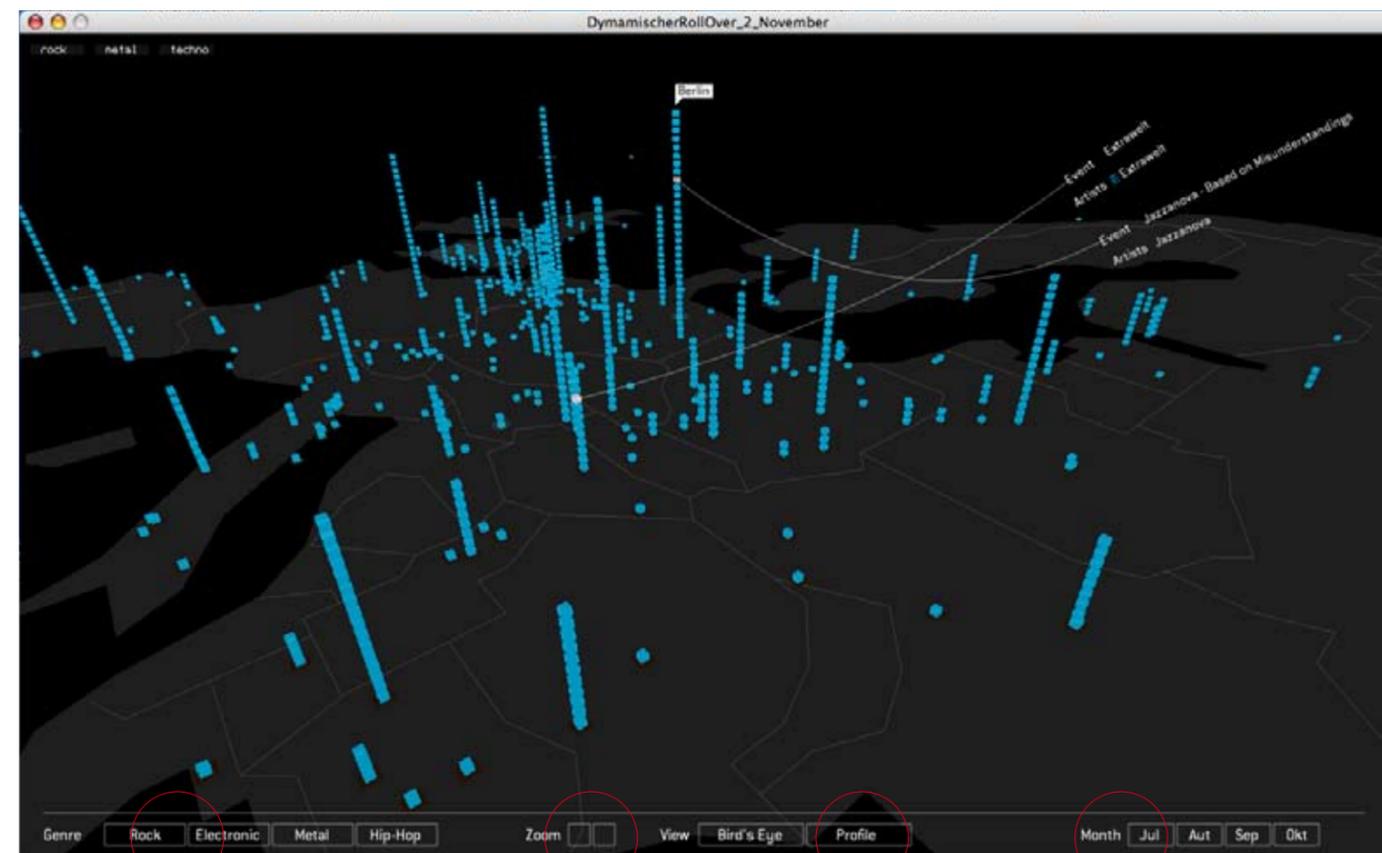
#03 Realizing Application



One column is built by several cubes. One cube is representing a concert, and one column a certain city.

On »Roll-Over« over the cubes we can see above the appropriate columns banners labelled by particular city names.

On »Roll-Over« we can see event names inclusive their performing artists in a circular arrangement.



The navigation gives you the possibility of selecting different genres.

Zoom-Button

Options of different views

Selection of several months of which concerts are indicated

Colour-Coding



Rock/Pop

Metal

Electronic

Other

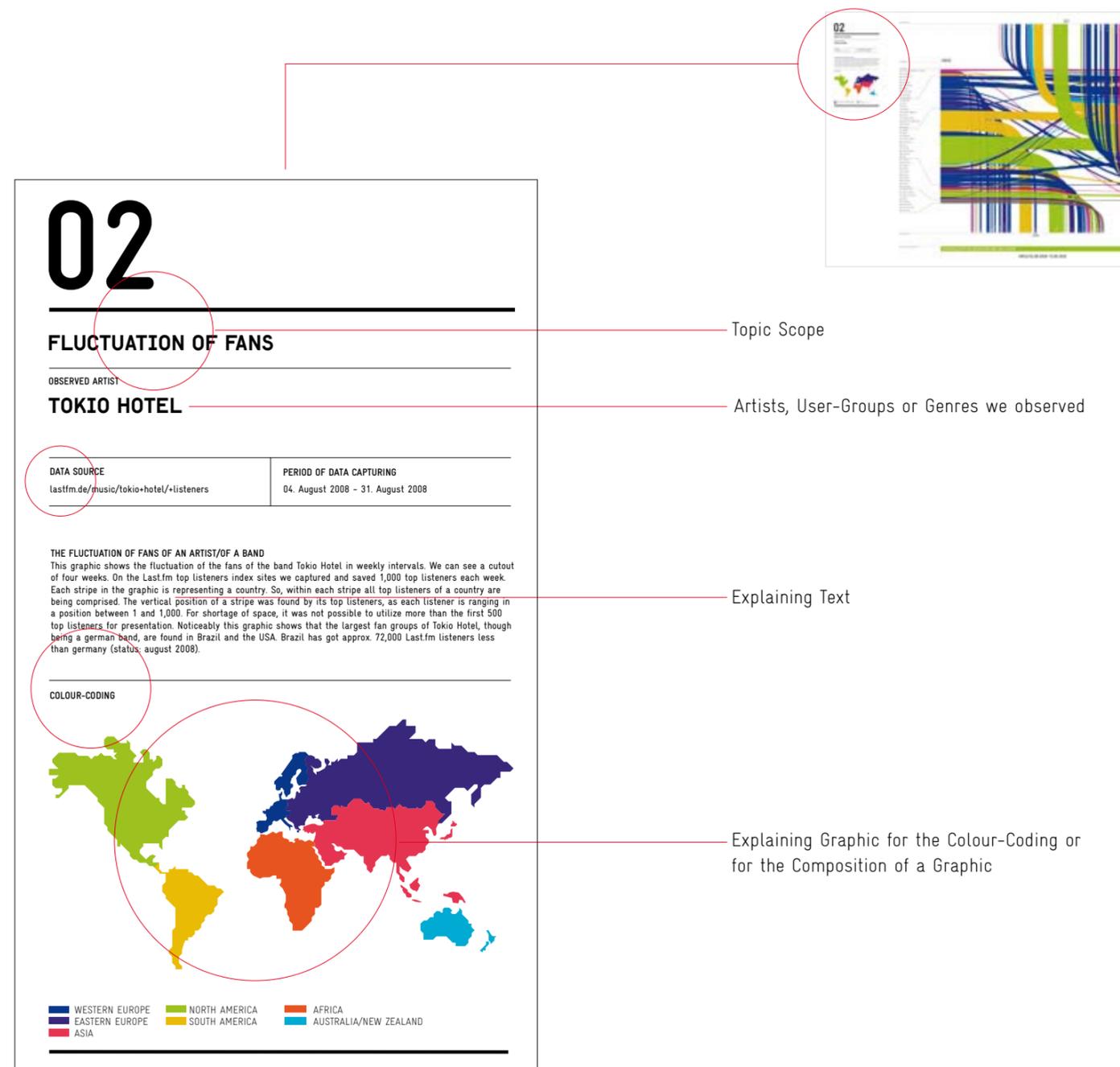
#04 Realizing Poster



The picture is a cutout from the exhibition poster. We can see Europe inclusive all the concerts of »Rock« and »Pop«, which were taking place in July 2008. Furthermore the performances of the band »Blondie« are connected by lines, which are following the tour-routes chronological.

Formative Elements

#01 Composition of the Poster-Label



On each poster the label is applied in the same place. It gives information about what is to be seen on the poster.

#02 Typeface

LUZ HEADLINE

GRAVUR CONDENSED

GRAVUR CONDENSED

GRAVUR CONDENSED

Gravur Condensed

Gravur Condensed

Gravur Condensed

For legends, labels and descriptions of our visualisations and posters we chose »Gravur«. This seemed to be particularly suitable for these purposes, as its round shapes adapt themselves very well to the graphics. It is not concurrent to them (the graphics) and yet remains strong in character. For labelling the

graphics we inclusively used majuscules being still well legible even in a very small size. »Lutz« in its function as a headline font was meant to be a real contrary and contrast to »Gravur«.

What have we learned?

In pursuit of data-visualizing, which within our project includes the comprehension and utilisation of data plus the conceptional elaboration and programmed visualisation of certain issues, we gained a deeper inside into information-design and its multiplicity. We noticed that several sets of data are interesting only if there is an interdependence and if they allow statements or conclusions that would not be possible in case of considering each set for itself. It is only the kind of visualisation plus the appropriate performance that allow to make clear to the viewer what is happening among the data and which new correlations are hiding behind. During the visualizing-process we often came across some difficulties concerning the psychological perception. We often saw ourselves challenged to see to a balance between graphical aesthetics on one hand and a precise visual presentation of an issue on the other hand. The working-out and testing of various solutions over and over again was in our focus and finally let us to the actual results. In the beginning we found ourselves with typical forms of illustration that often appear in relationship to

data-visualizing. This hurdle had to be overcome by either trying to elaborate and to combine forms of illustration or looking for original visualisations and use of form. Thereby we met with a number of tasks that do not directly have anything to do with design as such but were absolutely necessary for the realisation, starting from the advance and improvement of our programming skills up to the research for more complex mathematic formula or methods of stochastics. Even if all the visualized data gathered by Last.fm can finally only describe what is happening within this network an impression of general trends and tastes of music can be obtained.

Bibliography

Jacque Bertin

Sémiologie graphique, de Gruyter 1974

Edvard Tufte

Envisioning Information, Graphics Press 2003

Beautiful evidence, Graphics Press 2006

The visual display of quantitative information, Graphics Press 2007

Philipp Oswalt

Atlas of shrinking cities, Hatje Cantz 2006

Ben Fry

Visualizing data, O'Reilly 2007

Ira Greenberg

Processing, Creative Coding and Computational Art,

Friends of Ed 2007

Impressum

Monitoring and Visualizing Last.fm

Documentation of the Final Year Project of

Nils Holland-Cunz und Christopher Adjei

Supervisor: Prof. Eva Vitting, Prof. Philipp Pape

University of Applied Sciences Mainz 2008

Course of Studies: Design

