

Media Transparency - An Interactive Visualization of Advertisement Money Flows between Governmental Organizations and Austrian Media Companies

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ABSTRACT

In 2012, a law was passed by the Austrian Parliament, which legally bound all governmental organizations, to disclose their expenses for advertisements in different media. Since Q3/2014 an official notification containing data about those expenses is published by the Rundfunk- und Telekom Regulierungs GmbH (RTR) every quarter of the year. This project aims to gather new possibilities of visualizing the objective dataset for faster and easier processing of the information.

After getting familiar with the given data-sets the first step was to define use cases for our final application. We've decided that our tool should be directed at journalists or other politically interested persons who want to investigate governmental expenses in media companies and also at people who work in a certain sector and want to see what related organisations are doing with their advertisement budgets. After designing some low-level prototypes for dashboard views and charts and refining them again, we went on to creating a hifi-prototype in order to test our approach. Out of the insights gained from this iteration, we went on to implement a further iteration.

Our final application supports our target-group by letting the users explore the data-set in a interactive way but also by offering a search for quickly finding a desired actor and their expenses or revenues over the last years.

1 INTRODUCTION

The used data consists of expenses governmental organizations have made for advertising in different media companies. Because high expenses from a governmental organization to a certain media company could be a hint for some kind of influence on press opinion or other unethical entanglement, this data is not only highly interesting for journalists and people who work in the field of media/political sciences but also for every politically interested person.

The main goal of our application is to provide the user with a comprehensive and complete overview of our dataset, which will also allow for exploring the data interactively and getting more detailed information as the user digs deeper into the data. It should be easy for the user to see connections between organizations and to evaluate the expenses of them. We have devised typical use cases to better explain the problems and tasks a user would have.

In the first chapter we will elaborate a bit more on our data, especially its content and how we worked with it. In the second chapter we talk about our ideas and design decisions and the reasons behind them. Chapter 3 and 4 will be about our implementation, explaining what tools we used, how the tool turned out and what

the big challenges were. At the end we will sum up our results and discuss our approach and our implementation.

2 APPROACH

2.1 Ideation

As mentioned in the introduction, governmental organisations are bound by law to publish their expenses for adverts they commission. In figure 1 below, you can see a small sample from such a list of expenses in the way, published by the RTR.

Ausgabenübersicht	
Bekanntgabe §2 (Werbeaufträge und Medienkooperationen)	
ATV	13.179,40
Der Standard	11.084,00
Die Presse	9.162,00
facebook.com App	11.354,40
Heute	10.046,70
Infrastruktur Wien	18.081,15
Kleine Zeitung	7.542,00
Kronen	6.478,11
Kronen Zeitung	21.134,43
Kurier	10.479,36
Medienjournal Themenausgaben	5.310,00
Ö2 Nachrichten	6.052,91
ORF 2	44.625,00
ORF 100	12.375,00
Osterrund	11.047,90
profil	5.887,40
Radiojuger Nachrichten	11.081,42
SAT 1 Österreich	10.593,75
Stimme TV	10.146,30
tirol	6.180,00
Wochenend Magazin	10.460,00
Wirtschaftsnachrichten	5.860,00
www.krone.at	5.200,01
www.kurier.at	5.906,56
Bekanntgabe §4 (Förderungen)	
Förderverein lokale Ökonomie Netzwerk für Innovation	25.030,00
Österreichische Sportlots	7.005,00
Auslandskorrespondenten-Fonds (AKF)	
Bekanntgabe §2 (Werbeaufträge und Medienkooperationen)	
Leumediag	
Bekanntgabe §4 (Förderungen)	
Leumediag	
AUFTRAG FÜR UND VIDEO ONLINE	
Bekanntgabe §2 (Werbeaufträge und Medienkooperationen)	
Leumediag	

Figure 1: Example of the given dataset

We came up with some different Dashboard ideas to help the user cope with the huge amount of data. What all approaches had in common was an overview diagram. We came up with the idea of a network graph. The initial idea was that a network graph provides the user with a good overview about the connections between the organizations. But because of the nature of our data-set and the fact that it is not really a network, but rather a list of one-to-many connections, this idea was quickly discarded when we tried to do a first rough implementation. Even if we had went with this approach, we would've had to implement some filtering or grouping as the number of nodes and edges was simply too high to display properly.

The first idea was to group the nodes based on a common attribute, which would be for example the state or the governmental level (Bund – Bundesländer), and let the user select the attribute from a navigation bar or something similar. This approach didn't seem fruitful because our data really just consisted of the most basic attributes: It states which media company received money from which governmental organization in which quarter - and that's it. Grouping the actors by hand or based on information solely from their names would've been a tedious task and might have drawn the focus away from the actual task of visualizing data.

The other option was to display the whole network at first and let the user filter the data to reduce the size of the network, so he or she could focus on the relevant actors for the task. Our first test of this approach showed that it is not possible to display that many nodes

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in a browser and achieving reasonable performance, so we had to think of something else.

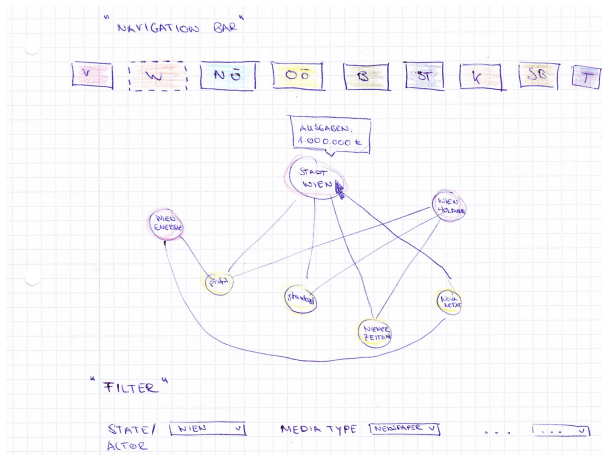


Figure 2: First low fidelity prototype

Another shortly-considered option for the overview diagram was using a matrix (figure 3). The idea here was that the user can pinpoint exactly the actors he or she wants and look at all the connections in detail. Therefore the actors have to be sorted in some way, so the user knows how to find the relevant actor. There could also be some kind of color encoding for the amount of money spent (saturation). Although we would've liked the idea of a matrix very much, the problem of the huge amount of nodes/links still persisted and a matrix didn't provide any improvement on that.

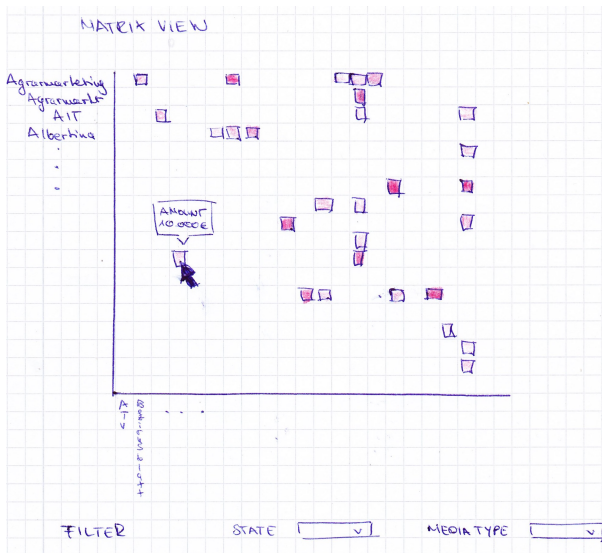


Figure 3: Low Fidelity prototype using matrix layout

All our approaches for overview-charts have in common that additional diagrams for detailed information are necessary to gain further insight into the data. For this case our idea was to use widespread diagrams such as bar-charts. They should give the user a better overview about the expenses and connections. This idea was then adopted to a new low fidelity prototype as seen in figure 4 below.

For the additional overview diagrams we stayed with the idea to use widespread diagrams throughout our process. Bar-charts

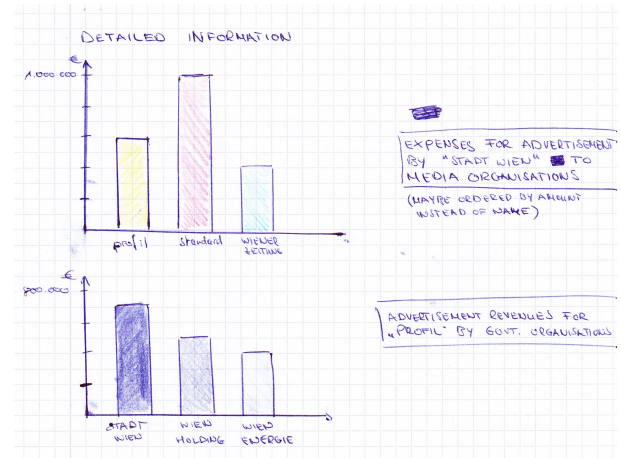


Figure 4: Low Fidelity prototype using bar chart

are known to a wide range of users and give a good and easy to understand overview about expenses. In an early stage we drew some charts by hand and also created a Tableau Dashboard to get a feel on how the data would perform in a real application while we were still in the ideation and low-fidelity prototype phase (figure 5).

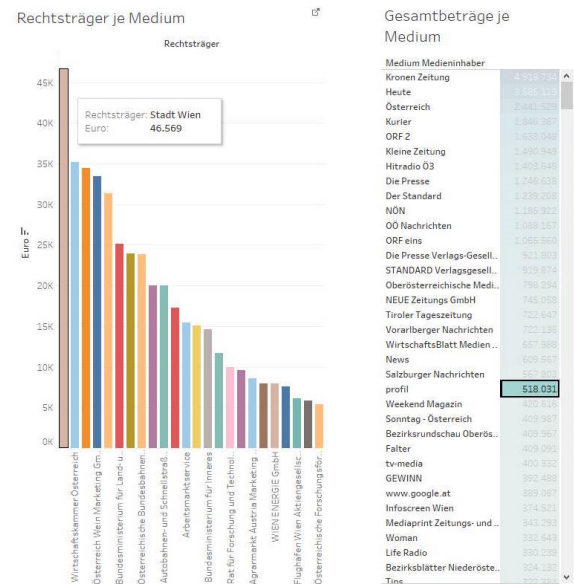


Figure 5: Tableau prototype using bar chart

2.2 Hi-Fi Prototype

After the first low fidelity prototyping phase we began to think our solutions through and encountered, that we needed to tweak our aforementioned approaches. The biggest changes in our visualization design for our final Hi-Fidelity Prototype (figure 6) was, that initially we wanted to do an overview in the form of a network, but as we played around with the data a bit we realized that it would be very hard to get an understandable overview of the data, which would not be just for good looks but use able. So we have decided to always just show the connections of one actor as a graph but provide an overview in the form of a lengthy bar-chart which lets the user see the actors sorted by their amount of money spent/received.

Furthermore we incorporated an alphabetically ordered list, so a user could also find an actor quickly by its name.

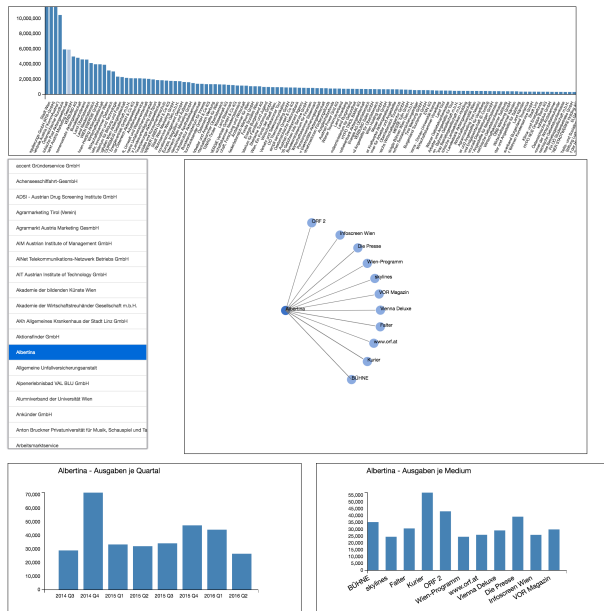


Figure 6: Hi-Fidelity prototype

For the smaller charts we stayed with plain bar charts, mainly because they have the advantage of being easily readable and well-known, but also due to the fact, that we have some missing data. For example the quarterly statistics are missing for some actors for certain quarters. If we'd used line-charts instead of bar-charts here, the missing data would've caused breaks in the lines. By using bars the charts remain readable but can still indicate clearly that there is something missing

2.3 Use Cases

We came about with two different use cases to better explain tasks and problems a typical user will experience.

2.3.1 Scenario 1: Thomas S. Jäger, Investigative Journalist

Thomas has a suspicion that the City of Vienna (Stadt Wien) is closely entangled with the austrian yellow press. He thinks that the city wants to influence the public opinion by booking a lot of advertisement-space in those newspapers in exchange for some favourable coverage of the ruling parties.

So Thomas decides to go online and search for some hints, but all he can find is some huge csv-files with a lot of numbers and names in them. As he surfs around a little more he finds our visualisation and decides to give it a try.

Because he wants to know about the City of Vienna he searches for that actor in our chart. Here the matrix or the additional overview for the network are probably the best choice as he can skim the list of actors and quickly find "Stadt Wien" (the navigation bar or filtering might even make it faster). When he finds it, he can then click on it which will trigger the displaying of additional information on the City of Vienna's expenses. On one chart he can see that the three media companies with the most ad-revenues from "Stadt Wien" are "Heute", "Österreich" and "Kronen Zeitung", which are the most-read yellow press papers in Austria. He can then further study the connection by looking at the change of money-flows over time and maybe compare them with his evidences, theories, etc. He could also click on one of the newspapers now to look closer at the involvement with governmental organisations for each media company. By using

the comparison tool, he could compare involved actors in parallel, which could also provide a little more insight.

2.3.2 Scenario 2: Salzburger Land tourism authority – winter sports publicity campaign

The tourism authority of Salzburg wants to start a new winter sports publicity campaign. Lately they lost serval thousands tourists to their neighbouring federal state of Styria. So the head of marketing, Mr. Maier, wants to investigate how much and where the most of the advertising is published by the Steirische Tourismus GmbH. For this specific task a large spec sheet like provided by the RTR is very uncomfortable. Mr. Maier needs a tool to get this data fast and easy. As he discovers our visualization tool he now has the chance to select all the interesting tourism authorities of Salzburgs neighbouring federal states and he can look up in which quarter of the year e.g. the Steirische Tourismus GmbH has spent the most money and on which advertisement in which media. To accomplish this task, he simply has to choose the governmental organisation he is interested in and he is prompted with a diagram of all the media in which the chosen organisation has placed an ad. He now sees the different media sorted from high to low focused on the expenses of the governmental organisation. Now, at a glance, he can see the media with the highest amount of ads, placed by the organisation he is interested in. This is a great chance for the Salzburger Land tourism authority to place their ads in a similar quantity in the same media. Now they can offer a second option to the recipient and maybe increase the numbers of overnight stays in the next season.

3 IMPLEMENTATION

3.1 Tools used

Our tool is designed to run as a website and was implemented using HTML, CSS and JavaScript, mainly with the help of the d3.js library and a little bit of jQuery.

3.2 Challenges

The biggest challenge while implementing our tool was the learning-curve/programming-overhead when using d3. It is a very potent library, but also not the easiest to handle if you're working with it for the first time (and maybe aren't even very experienced in JavaScript). Precisely planning the effort for implementing a feature was almost impossible as often little things that initially seemed rather trivial would take a lot of time to get your head around. We also had to do a lot of refactoring at some point because a lot of things in the first hi-fi prototype we're implemented working but sloppy. This unfortunately put the focus of our work more on solving technical/programming problems, rather than being able to concentrate mainly on the visualization itself.

4 RESULTS

Despite our time-related shortcomings we have an implementation which clearly followed the path of our iterative process and can illustrate our concept of using it as a tool for our target-group.

4.1 Scenario of Use

If we take our scenario of an investigative journalist, who wants to find some data to back up his suspicions, we can walk through this explorative process.

When opening the website, the user will at first see the overview bar-chart and the list containing all the actors which can be searched dynamically by typing in the search-box above (figure 7). For the distinction between media-companies and governmental organisations, we have implemented a toggle above the overview. This way the user can easily switch between the charts for actors from the two groups. Our journalist will open the website because he wants to look up some data for the "Bundesministerium für Inneres". If he doesn't find it on the overview he can type into the search-box

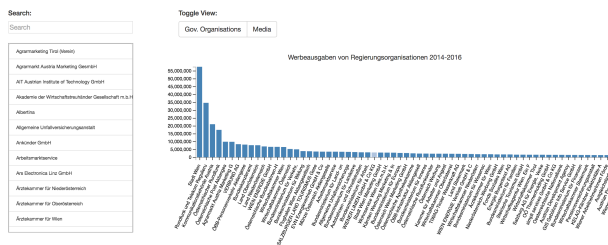


Figure 7: List, overview and toggle

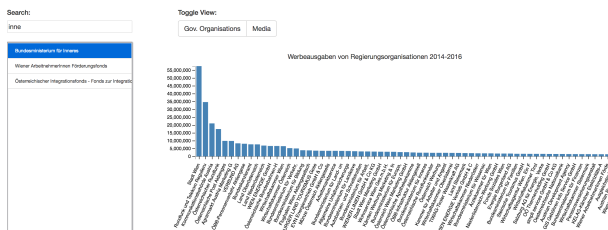


Figure 8: Searching the list

to filter the list by matching results. This way he quickly finds the "Bundesministerium für Inneres" and now he can click on it (figure 8). This will update the charts containing detailed information below (figure 9). The tree-like graph on the left shows the journalist all con-

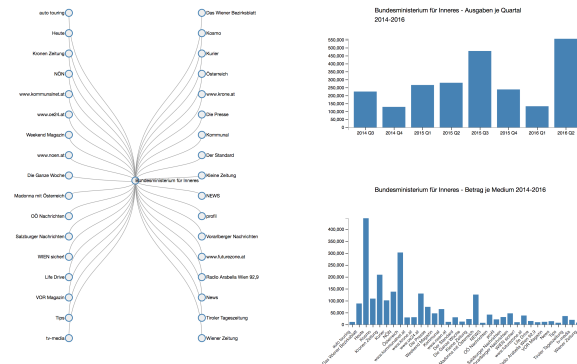


Figure 9: Detail View

nections at a glance and can provide information about the amount of money spent via tooltips. This information is also displayed more precisely for each medium in the lower bar-chart placed next to the tree-like graph. Above that bar-chart is another bar-chart displaying the amount of money spent for each quarter. Our journalist then sees that the three top-receivers of money from the "Bundesministerium für Inneres" are the top-three yellow-press-papers in Austria, which was just what he expected.

Now he can further examine these payments by clicking on the bars for the respective quarters, which will update the bar-chart below in order to display the amounts of money spent for the selected quarter (figure 10, figure 11 - at the end of the document). This way our journalist could for example make a link between the rise of advertisement volume in a specific newspaper and the reporting of the respective newspaper.

The same workflow can be applied to the media-centered view (figure 12, 13 - at the end of the document).

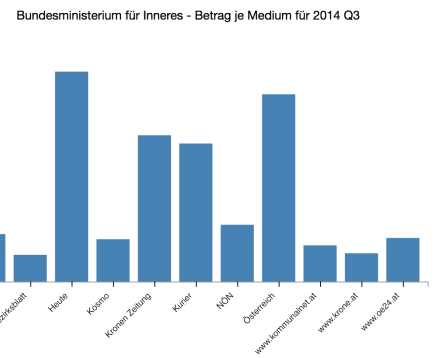
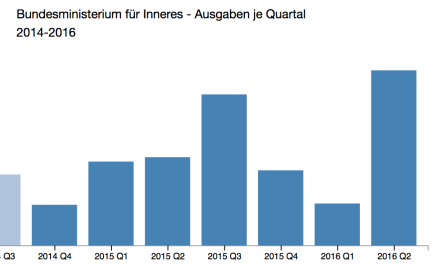


Figure 10: Selecting a quarter

4.2 Performance

The initialization of our application takes some time because all the data has to be loaded in the program. After this loading-time the program performs without noteworthy delays.

5 DISCUSSION/CONCLUSION

The version which is included in this final report clearly lacks a final touch and some features, which is due to previously mentioned challenges when implementing the final application. but Nevertheless we think we went through a process which showed us what is necessary to provide a comprehensive visualization of the given data-set for our specific use-cases. More importantly we have gained a lot of insight on what will not work and how difficult some previously thought to be trivial tasks can be. The main issue that persisted throughout the implementation was making the charts responsive to the different amounts of data they had to display. This at last became very clear when showing the tool to real users. Here the wish for some kind of brushing/zooming was always a concern. Also further possibilities to directly compare actors and time-spans would have been something to look into further.

All-in-all our tool is a good first step in working up our data-set and visualizing relevant information gained from it, but we would have liked to incorporate some more features and refinements if we had more time.

6 TASK SEPARATION

- Raphael Jüttner: further d3 implementation, report
- Bernhard Potuzak: report
- Ramon Miftari: report

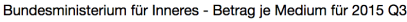
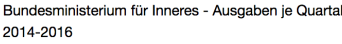


Figure 11: Selecting a quarter

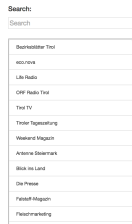


Figure 12: Media View



Figure 13: Media Detail View