Vriendjespolitiek.net

Information Visualization

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Group 1

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1. Contextualization

Since the birth of online social networking sites lots of people have, quite unconsciously, put their likes and dislikes on public display. They not only show with whom they affiliate, but also what kind of music, movies, food, or even brands they prefer.

Since 1998, and on paper since 1989 (Stemwijzer 2008), general elections in the Netherlands have spawned a variety of so called voting recommendation machines. These systems typically ask the user to answer some questions after which they offer the user a voting recommendation, based on the compatibility between his or her answers and the political parties. The questions are either based on the political party's programs (Kieskompas 2008), or on its actual voting behavior in Parliament over the past few years (Politix 2008).

We have developed a post-demographic recommendation tool derived from digital life software systems, while at the same time addressing them - based on the aggregated profiles of pals of political party leaders as they appear on the biggest Dutch online social network, Hyves. By providing appropriate visualizations we show both the demographics and the relations of a group of pals, and replicate the existing, arguably anti-participatory democratic, voting recommendation machines. Ultimately the goal is to raise awareness of one's digital public self - one's data body (Well.com 1995) - to create conscience of simple yet powerful profiling techniques, and the tools of the surveillance and control society. (Bogard 1996, Deleuze 1992). We intentionally chose to highlight the entertaining quality and lightness of peer-based behavior this society is so immersed in. In addition, this paper introduces and explains the term post-demographics (first coined by Richard Rogers in June 2007) in the context of control society.

An online social network is a web service where people form communities and share interests and activities or explore the interests and activities of others. Every day millions of people use all kinds of social networking websites on a regular basis; social networking seems to have become part of everyday life. Users can make a profile to introduce themselves and make 'friends'-connections with other users. Most social networking sites are open/public to all web users and are designed to attract advertisers, who can customize adds according to a user's preferences.

Online social network sites are the newest version of mediated publics; they are environments where people can gather publicly through mediating technology. In a certain way mediated publics are similar to unmediated publics (e.g. parks, malls, the sea shore). Dana Boyd (2007) however stated that four significant features distinguish mediated from unmediated publics: persistence, searchability, replicability, and invisible audiences. As the mediated data are archived in databases and made public on the web, they stay traceable for a long time – the submitted data are persistent. The Critical Art Ensemble described this (often automatic) creation of one's digital public self as the Data Body (Well.com 1995), a virtual body composed of the files related to an individual. Because one's digital representation is stored in a database with an associated index, it might be retrieved by a simple web search. Digital data are also easily replicable and tampered with, so you never know what is original. And finally, because lots of data are public, you never know who is reading along. "In mediated publics, not only are lurkers invisible, but persistence, searchability, and replicability introduce audiences that were never present at the time when the expression was created." (Boyd 2007)

No wonder that online social network sites change interaction [between teenagers], as well as their representation to the outside world (Boyd 2007). Research however (Boyd 2007) made apparent that most users of online social networks are not aware of the various concerns related to them. When concerns do appear in the news, they focus in most cases on the invisible audiences, i.e. privacy (e.g. sexual predators, identity theft, marketing, police investigations, job rejection, governmental control) (Albrechtslund 2008).

In order to understand why these concerns should be addressed we must take a look at a short history of profiling. For the 1890 U.S. Census, Herman Hollerith built a tabulating machine, to automatically crystallize information about every single U.S. citizen. This aggregation and automatic counting of statistical data was quickly adopted for research, business marketing, and planning purposes. The value of demographic relationships was later increased when information about commodities and services was integrated or cross-referenced, by more advanced computers, e.g. with consumer or sales data; consumers could then be sorted into taste groups, 'clusters', or 'profiles' (Elmer 2004). This discriminatory practice allowed for more specific customer or group targeting – following the shift to a post-Fordist, mass customization and just in time economy. With the networking of demographic databases the limitations of timeliness could be overcome, and real-time, or continuous, tracking and inventory applications were developed, allowing for ingenious feedback loops. This rationalization of relationships between bits of demographic, psychographic and consumer behavioral data can provide condensed pictures or profiles of particular groups and places. This is also called dataveillance, "the systematic use of personal data systems in the investigating and monitoring of the actions or communications of one or more persons" (Clarke 1988). Moreover, the automatic grouping and data mining can lead to population characteristics and relations which were not known, or did not exist, before. These derived and previously non-existent characteristics and relations are post-demographic, as demographic data refer to factual population characteristics. With Vriendjespolitiek.net the post-demographic element becomes apparent when relating users' preferences to a voting recommendation, thereby attributing political value to his or her preferences.

"Information systems increasingly place individual wants and desires into larger, rationalized and easily diagnosable profiles (demographics and psychodemographics). Surveillance in this light cannot be removed from notions of social control or from the potential for certain planned effects." (Elmer 2004, p23)

Talking about surveillance implies Foucault coming into the picture. Foucault noticed that subjects in populations are involved in political power relations. He discovered connections between institutional (re)organizations and scientific disciplines. According to Foucault, sciences are predominantly organized and shaped by practices, or bodies of text – which he coined discourses. For the 18th and 19th centuries Foucault used a discussion of Bentham's panopticon to describe these connections between (social) science and institutional organization . "The discourse/practice of the panopticon was a condition for a new form of biopower, a means of controlling masses of people for the development of industrial processes" (Poster 1990). As in Bentham's panopticon, Foucault described surveillance as a classificatory architecture, an archive in which individuals or bodies are separated and classified by way of files. "[T]he surveillance is based on permanent registration", at the beginning of the 'lock-up' a document for each inhabitant of the panopticon (the prisoner) is made which bears "the name, age, sex of everyone, notwithstanding his condition" (Foucault 1975). Without the recording and storing of the subject's behavior, surveillance is incomplete. The emerging social sciences thus supplied administrations with the knowledge of record

keeping and its evaluation. This aggregated demographic and psychographic data allowed for the control of entire populations through biopower: the “explosion of numerous and diverse techniques for achieving the subjugations of bodies and the control of populations” (Foucault 1976). In Foucault’s so called disciplinary societies,the panopticon was the ideal project of an environment of enclosure in which a body – described by demographic and psychographic characteristics, could be subjugated to power, or molded to a category or norm, by the techniques of biopower. This then gave rise to biopolitics; that mode of organizing, managing, and above all regulating the population, considered as a biological species entity (Thacker 2005).

Deleuze (1992) argued that Foucault’s concept of the disciplinary society was overtaken by the society of control. He conceptualized the way in which modes of data accumulation, storage, and processing are networked into an increasingly dispersed and automated infoscape. These modes with immediate feedback loops boil down to a modulation of coded figures, rather than to the fitting of a body into a mold. Galloway (2004), linking Deleuze to Foucault’s biopolitics, states that control societies deal with the way life may be analyzed and controlled from a distance. Whereas the context of Foucault’s biopolitics are the practices of statistics, demographics, and population control in the 18th and 19th centuries, his theories may also be viewed in the light of post-demographics. In control societies the body becomes obsolete, like the molding of the deviant in disciplinary societies could only be enforced by the existence of fixed categories (or norms derived from the ‘normal’ in the category). With the derivation of post-demographic properties from dynamic aggregations the coded figure can no longer be molded to the norm – the norm has ceased to exist, but is constantly tweaked and modulated - granted or denied access. The development of computer-matching or -profiling techniques attempting to attribute general characteristics to individuals for the purpose of discriminating them - should therefore be questioned, especially if users of online social networks are proven to be constantly lured into giving more personal information, which is then persistently stored, indexed and publicly searchable.

Lyon (1994) claims that users now “’trigger their own inclusion into systems of surveillance”. They voluntarily put their information on public display and are constantly lured into providing even more information. Although various authors argue that this online exhibitionism might actually empower users (Chun 2006, Albrechtslund 2008) it also makes the profiling of public data possible. Profiling or establishing a category means, however, that sorting individuals and groups is inherently discriminatory.

Vriendjespolitiek.net intents to raise awareness of this potential to categorize and individuate; as well as the possible conclusions which can be drawn from it. A crawler aggregated the profiles of the pals of all Dutch political party leaders. Data mining techniques and appropriate visualizations were used to match any Hyves user with a political leader, based on the profiles of the party leader’s pals. In a democracy, people’s representatives are elected. In Vriendjsspolitiek.net we considered links with a political party leader to be votes for that same person: his ‘pals’ are his electorate. The small world model has it that ‘birds of a feather flock together’; people whose profiles show similar preferences are likely to be pals (Krebs 2005). Our exploratory research indicates that this is also valid for pals of Dutch political party leaders. For instance, Bible readers are likely to be pals of Andre Rouvoet, a deeply devoted Christian political party leader. Data mining the profiles of the political party leaders’ pals, labels their aggregated, combined, and analyzed preferences, which subsequently can be used to provide voting recommendations for a person who is not explicitly known to be a pal of a political party leader. A voting recommendation system based on social network profiles is born.

Since 1998, and on paper since 1989 (Stemwijzer 2008), general elections in the Netherlands have spawned a variety of so called voting recommendation machines. These systems typically ask the user to answer some questions after which they offer the user a voting recommendation, based on the compatibility between his or her answers and the political parties. The questions are either based on the political party's programs (Kieskompas 2008), or on its actual voting behavior in Parliament over the past few years (Politix 2008).

We thought a voting recommendation system based on social network profiles to be a very good tool to address the concerns of preference exhibitionism (entailing data persistence, searchability, authenticity questions, and lurchers), because in a democracy the ballot should be private and secret. By relating apparently non-political preferences to political forecasts the users of Vriendjespolitiek.net realize that their voluntarily displayed data may start a life of their own, spreading around conclusions they'd rather not have on public display. The power of profiling is visualized by clustering the users' preferences to politicians. Searching a pal, or comparing a politician to his own 'electorate' becomes possible: the user becomes a lurcher. By tweaking one's preferences to fit a certain 'political profile', authenticity cannot be taken for granted any more. Or the other way around: what if politicians tweak their messages onto certain groups? And even: representative democracy or rather a democracy of representation? "It is time to put the demo back into democracy." (Mayfield, 2005).

2. Goals

This chapter contains two parts: in the first part we will explain how our contextualization and idea are translated into ideological goals, in the second how this was translated into an information visualization.

2.1 Ideological

At each and every election many Dutch voters do not know for which political party to vote. This undecided electorate in most cases does not have sufficient information about the party programs to be able to choose their political representative. Since the general elections in 1998, several voting recommendation systems came online to aid the user in their quest for a suitable political party. These voting recommendation tools work via a set of ethical questions applicable to all programs of the various political parties. While they provide a simple and clear recommendation, the questionnaire is often too short and inconclusive to provide accurate advice. The content- and term validity of the propositions presented are questionable (Groot, 2003), because many issues will not be addressed and party specific standpoints are often overlooked because they do are not applicable to other parties.

These systems ask you a set of predefined questions but do not address the personal, customized post-demographic, aspect. We overhauled the previous voting recommendation machines and created a political recommendation tool entirely based on non-political information. In Vriendjespolitiek.net the new characteristics of contemporary online interaction and communication like persistence, searchability, replicability and invisible audiences (Boyd 2007) are addressed by taking the public availability of the data body as a topic. The younger generation is growing up with these online digital features, but they seem to be hardly aware of their implications. With our application we try to address the characteristics and possible

uses of the public data body in a natural and entertaining way. At the same time we want to explore post-demographics in control society by giving political value to (seemingly) non-political preferences.

By connecting seemingly unrelated data from large data sets, new information is composed. For example, the profile of pal X of Wouter Bos becomes meaningful when connected to the profiles of the other pals of Wouter Bos; averages can be calculated and trends spotted. From a user point of view, Vriendjespolitiek.net is designed to explore the connection between the preferences of the pals of political leaders and the user's preferences, in order to give a voting recommendation. The user can explore his preferences regarding politics by choosing between demographic attributes like age, date of birth, living, gender, status, occupation, location or hometown. For likes one can choose from music, books, movies, tv shows, gadgets, religion, clubs, passions, brands, travel, schools, sports, living. Each of these categories can be checked separately. By using several information visualization patterns and techniques such as linking, brushing and direct query, we want to offer the user a deeper understanding of the aggregated and linked data, the possible conclusions, and implications thereof. We also wanted to offer the user a chance to alter his profile in order to see how this would change his political match. When changing his profile - 'the Bible' as preferred reading instead of some novel for example – the user can try to influence the voting recommendation until a satisfactory advice is produced. This aspect of the application is intended to create awareness about invisible audiences and the authenticity of online profiles, and raises questions about peer pressure: If you are the only one in your peer-group who has Wilders as a voting recommendation, would this embarrass you to the extent influencing this by just changing some preferences? And if so, maybe your pals would be tempted too. Let's hope this raises some questions about the authenticity of the profiles you are checking.

When using the application, the user will discover the political value of the various preferences of the Hyves profile. Funny but interesting facts will appear: Is Harry Potter a socialist book or is Lee Towers actually a musician conservatives listen to? At the same time, the application demonstrates that the way in which voting recommendation systems categorize and sort individuals, may be intrinsically discriminatory. Also, if the user can fill in just any public profile, the searchability of our offline selves is highlighted; the user is made aware of the fact that anyone could check his political match.

Educators and maybe even the older generation in general, are usually worried about the careless way in which the younger generation handles their personal information in online public environments. Boyd identified three categories of reactions (Boyd 2007): the first group sees the social technologies as pure evil and believes it will destroy today's youth. The second group just ignores it, while hoping it will disappear by itself. Slowly a third group is appearing, they think it is important to understand what is going on and want to give young people guidance in their online development. Boyd also thinks this last category is questionable because in order to make this work, one has to let go of already existing assumptions, which will be hard. With Vriendjespolitiek.net we intent to lay out a fourth way to address the subject of online existence: we designed the application in such a way, that the criticizing aspects of online social networks is done from within the environment of the target group: we use Hyves-profiles to address its characteristics. We will not say what is wrong or dangerous, but we try to raise awareness of the consequences of the public data body by showing its possibilities, once scraped and connected. The user's role is amplified by the interactive part: by filling in a username, clicking on different preferences or on any of the political leaders, the data will immediately be scraped from the web. This means that the user will have a sense of immediacy that will enhance his aware-

ness of the topics at stake. The user can intuitively move through the application, can compare data and draw his own conclusions.

2.2 Visualization

The core proposition of Vriendjespolitiek.net is that the data should speak for themselves; we do not want to present a thoroughly processed hypothesis but want the user to interact with the data and come up with his own conclusion. Thus our application is considered to be an exploratory data analysis (Tucky 1977), because it aims at letting the data themselves influence the process of suggesting hypotheses instead of only using them to evaluate a priori hypotheses.

Our application is founded on the principle that the user can interact with data relating to him. He is in the center of the application, just as is the case in the Hyves-community; this makes it appealing to enter the community for usually uninterested or inexperienced users, as it is low profile. People already interested in interactive visualizations will be accustomed to visualizations like Gapminder and Vizster, but the average Hyves user r does not have a clue what these visualizations are and what they mean. As explained by Brandes and Wagner (2003), user feedback indicates that many people who usually find data exploration and analysis complicated and unnerving, enjoy the playful nature of visual interaction. Vriendjespolitiek.net tries to implement this notion by merging scientific analysis with a visualization of popular culture in order to create a better understanding of how social networks may be used.

To help the user draw his own conclusions, as well as to show the tight relationship between preferences and political party leaders, we decided to use a visualization that clusters related things. According to Freeman (2000) the evolution of these diagrams progressed through five different phases; from the first phase with hand drawn graphics whose creators did not have a very clear understanding how to sufficiently construct and design the visualization sufficiently, to the fifth phase, with computers used to produce the visualization and with users allowed to interact with the data. In this fifth phase the applications used were not freely available, only the results were widely distributed, but the interactive visualization was still limited to a few insiders. According to Kol (2007) this is where the sixth phase comes in, allowing everyone to use and explore the visualization themselves.

The ego-centric starting point of our application underlines the philosophy as described by Heer and Boyd (2005): “start with what you know, then grow.” The most relevant information concerning the user is displayed first, showing details instead of an overview of the entire network. As the user progresses in the application, he or she is gradually moving away from his ego and slowly entering the domain of statistical analysis, albeit in a playful environment.

According to Brandis and Wagner (2003) there are three levels of interest within social network analysis: the element level, the group level and the network level.

1. On the element level the user is interested in properties, single actors and links, which in the case of Vriendjespolitiek.net are the relations between the politicians and the user, displayed in the default screen and in the graph bars. The questions the user wants to be answered on this level are “to which politi cians am I linked” and “with whom do I share most similarities with my profile.”

2. On the group level, classifying the elements of a network and clustering identification is interesting; in our application these elements are portrayed in the preferences thus unveiling clusters between politicians and preferences.

3. On the network level, the properties of the overall network are relevant, i.e. data responsible for the links between the nodes. Data about how many Hyvers share a preference with the user, come closest to the raw data, but can provide valuable information about how the visualization operates and how certain connections are made.

3. Design

The previous chapter discussed the ideological and visual requirements for Vriendjespolitiek.net. This chapter will provide an in depth review of the actual design. To begin with, some of the choices of the design student are described, then the information visualization theory is applied by the new media students.

3.1 Visual Design Choices

The general layout

At the beginning of the design process, our concept was not sufficiently clear, so I had to begin sketching possibilities to visualize the match between a politician and a social network profile. Different data visualizations were tried out, such as tree mapping and the use of Cartesian axes, to visualize the matching and to show the profile and the different parties in a political continuum (see also images 1-3). The target user group of this application is young and rather visual orientated. People should easily access and feel visually attracted to and comfortable with the general look of the application. The colors in this first general layout were those of the Dutch flag: red, white and blue. The environment was friendly, cool, relaxed and inevitable.

Image 1. *Tree mapping*

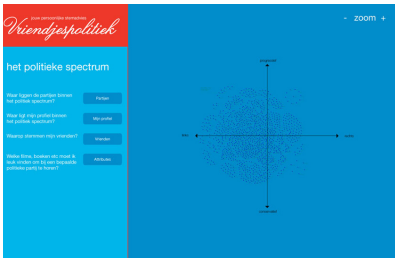

Image 2. *Cartesian axes*

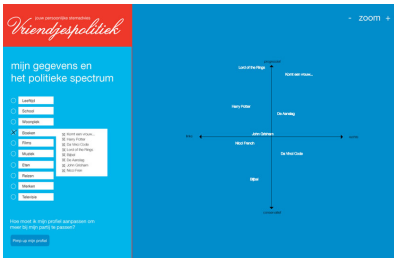

Image 3. *Political continuum*

This first attempt of visualization showed some weaknesses in our concept. At first the visualization just presented a match between a user's profile and a politician's profile, although we did not actually try to match the politicians' profiles, but the politicians' pals' profiles. Then the data visualization did not give room and possibilities to individually explore the data set. It was impossible to exploit the data set in a dynamic, interactive way. It was too static and reminded too much of some traditional voting recommendation system; it did not fulfill real information visualization requirements.
While developing our concept we decided to work with some kind of cluster map, to demonstrate the relationship between the politicians' pals' profiles, different attributes and the

specific profile you want to check. This should offer the user more flexibility to explore the data and compare his profile with the attributes, and politicians' pals' profiles amongst each other. As for the layout we finally decided to put all inquiry functions into the top bar and all valuable information concerning the main data visualization as a user profile, bar chart and information box into the left hand side bar. The left hand bar offers additional information about the cluster visualization and presents an updated bar graph of the matching when preferences/attributes are changed. The Inquiry and information sections are then clearly kept apart, which makes it more user friendly. As for the colors, we changed the background colors into 3 different shades of green. The overall layout is more subdued than if red, white and blue were used. With lots of data the overall layout should not attract too much attention. But the color orange is intended to ink the site to the Netherlands and is used in the logo and the mouse-overs. Icons and politicians become orange when moved over, emphasizing specific connections.

Politicians' pals

At first we tried different versions to emphasize that the matching does not apply to a specific politician's profile but to a politician's pals. This was visualized by drawing a circle around the politicians' pictures, its diameter indicating the number of friends. In another option to the pals were visualized by little squares, each representing 1,000 friends, thus making the numbers more easily and immediately recognizable. But we then decided not to visualize the pals as they were too prominent and distracting from the actual data. We tried to solve this problem with data tips and mouse overs. This made the data set more obvious, but could lead the user to wrong conclusions, i.e. that the matching was based on the actual politician's profile. So finally we invented something like a pictogram, depicting people holding hands around the politician's picture (image 4). It does not indicate a specific number of pals, but underlines that the matching refers to the politician's pals and not to his profile. This 'circle of pals' surrounding the politician's picture is also used in the logo (image 6). Moreover, the matching is illustrated in the introduction, the data tips, the additional information window and the mouse-over.

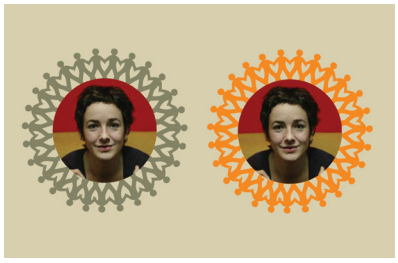

Image 4. *Politician pals*

Image 5. *Icons*

Image 6. *Logo*

The Logo and icons

The Vriendjespolitiek.net logo consists of a marking spot on ballot papers where people can indicate their vote for a specific politician or party. This marking spot is surrounded by the circle of pals, also used in the data visualization. A cross refers to a vote for Vriendjespolitiek.net. The cross together with the marking spot uses the Dutch national colors on an orange background. An attractive handwritten typeface is used for the name Vriendjespolitiek.net. The profiles' preferences are represented with 20 round icons, visually indicating depicting the preferences. The icons are white on a green circular background (image 5) and become orange when the mouse is moved over. They will also light up in connection with a selected politician.

Technical translation of the design sketches

The application still exists only in a beta version, because of very short period available for the entire project. Not all aspects of the design sketches were fully translated because of technical reasons. A further step in the design process would imply the more detailed adjustment of the typography, icons and other layout aspects in the actual application. By actually experimenting with the application, these issues become more obvious. If the project were to be continued, graphical devices would have to be fine tuned and some choices reconsidered and adapted.

3.2 Information Visualization

In this section we decompose the graphic into its different constituents (image 7).

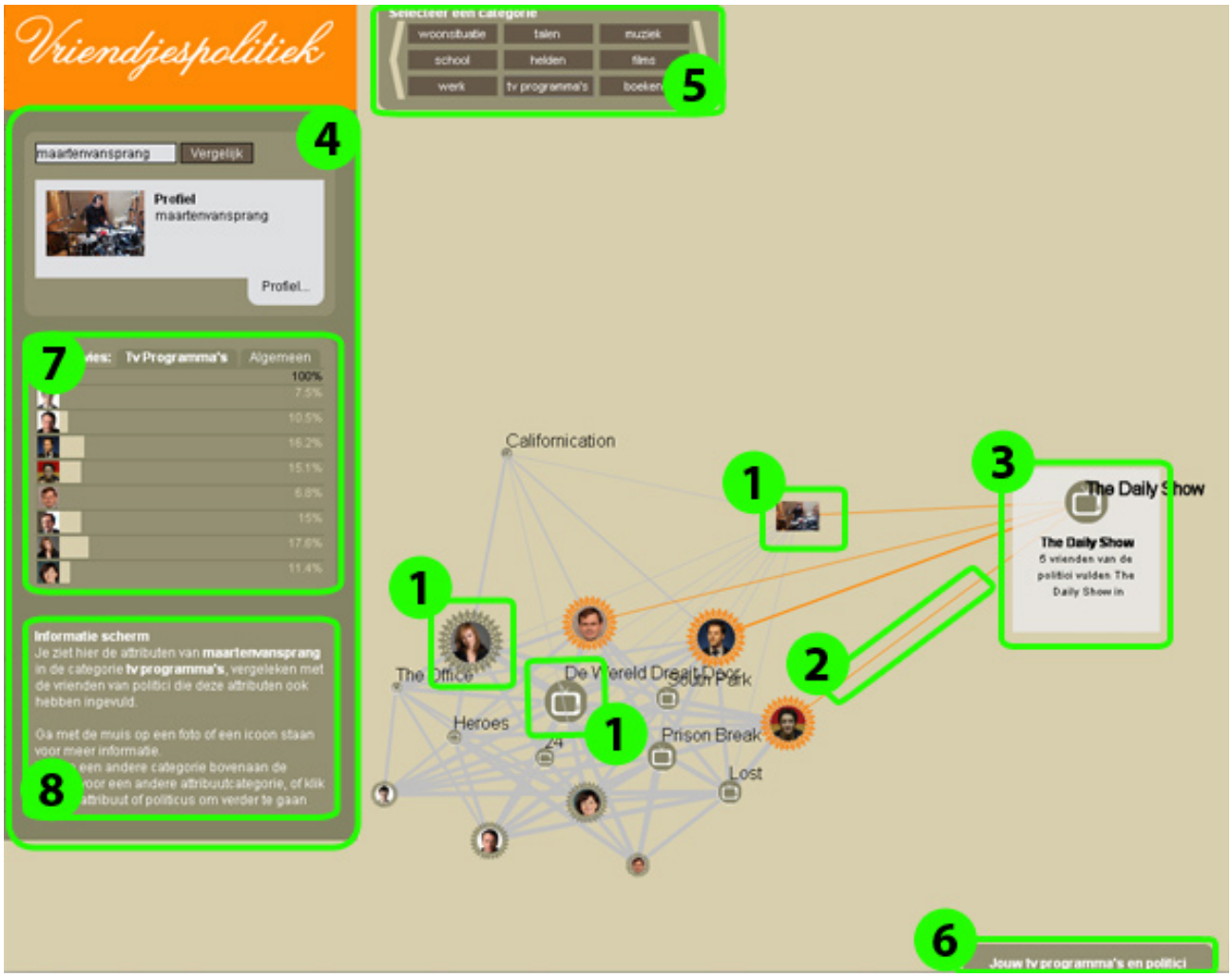

Image 7. *Nodes (1), edges (2), datatips (3), left hand side (4), attribute navigator (5), page title (6), bar chart (7), infobox (8)*

Nodes (1)

The application's key elements are the three types of nodes; users, politician's electorate and preferences. These different types of nodes apply Tufte's multivariate, maximizing complexity and small differences principle. Preference nodes are displayed by icons, the user and the politician's electorate by pictures. Because we want an efficient distinction between user and politicians, we use two visual techniques to enhance preattentive processing (Treisman, 1985):

1. Differentiation through form: the user's picture will be the Hyves account's pro file picture, because this can be generically retrieved from the Hyves profile and are rectangular. The politicians' pictures are stored locally and are round. This way the nodes differ.

2. Differentiation through icons: the politicians' portraits will be accompanied by a circle of stick-figures to differ politicians and user. But the metaphoric circle of pals also keeps on reminding the user that politicians represent an electorate of Hyves-pals and not the politician's profile itself.

Node size was used to indicate whether the nodes match with the user. The most significant matches are displayed by 30 pixel icons. The least significant ones by 10 pixel icons; everything in between is scaled accordingly. In the example below, the television show "Sleeper Cell" has no matches with any politicians' pals, therefore its icon is of the smallest possible 10 pixel size. The "De Wereld Draait Door" show on the other hand is immensely popular and thus has the largest possible 30 pixel icon (image 8).

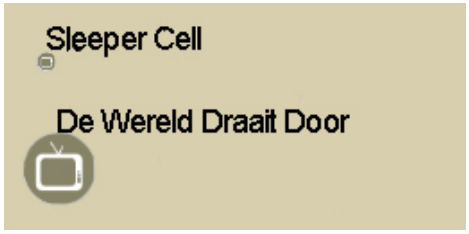

Image 8. *Example of a 10 and 30 pixel icon*

Edges (2)

The second key visualization element are the edges linking the nodes; they are non-directional as arrows would lead to misinterpretation (Tufte, 2006) and would not add valuable information. Once a node is hovered over, the corresponding edges will light up, according to the brushing principle (Spence, 2007). Colors emphasize certain states (unselected, hovered over), but they are only meant to clarify the interaction to the user.
The visualization's edges differ in thickness to easily and intuitively show their importance to the user. This highly reduces the user's mental strain, as acknowledged by Tufte (2006), who states that edge thickness enhances cognition because it allows the user to immediately see the strength of a relation between two nodes, without having to dive into the statistical data.

Clustering

As stated before, the clusters immediately indicate a user's classification with his or her preferences. We intended not only to center on a person but to mix politicians' and user's profile preferences, thus contributing to the understanding that knowing preferences involves power signification. The different node types in the cluster map thus align somebody with a politician. Although perhaps not a politician's pal, your link to him can be evaluated. by calculating the number of connections between the different nodes.This basically means the number of politicians' pals with a certain preference. A spring embedded algorithm then calculates node positions based on these connections so that the relative positions in the graphic space are meaningful: the closer individuals are to a certain preference, the more they are compatible.

Data tips (3)

As will be explained in the evaluation, display clutter (Eick, 1996) emerges when the nodes

in the application all link to each other. If 'level three information', such as percentages, number of users and the composition of matching would be added as well it would become too overwhelming. Therefore it is left out of the default visualization to limit the amount of display clutter. But the additional information is too valuable to completely ignore, therefore we added the concept of data tips (Tidwell, 2006) in our application. When hovered over a visualization's element, the absolute data about the number of users with the selected preference indicated in their profile will be displayed via the data tips. These data is valuable to the user because they provide a meaningful insight into the actual number of people accounting for the match.

Left hand side (4)

At the left hand side all components that do not directly influence, but contain valuable information of the main visualization are shown. They consist of the following elements:

1. The input field: the same field as on the landing page. When the user first selects the Hyves account name, it will be completed during the remaining session.

2. The user profile: the profile of the current Hyves account. The default state is folded in, to save valuable space at the left hand side. Clicking on "Profiel…" (profile) will result in the expansion of the field, showing all submitted profile information.

3. The bar chart: a different view of the matching between user and politician. We felt it to be important to give a synopsis of the, often large, cluster maps as well, in order to be even clearer. The "algemeen" (general) tab will be accessible throughout the application, indicating the initial match based on the total number of preferences given by the user in relation to the politicians' electorate. The second tab will be related to the preferences the user is viewing, e.g. when the user is viewing media, he will see the match between himself and the politicians' electorate based on media-preferences only. The tabs enable switching back and comparing the results to the initial match.

4. The infobox: its function is twofold: it tells the user what he is currently viewing and what he can do next. It is the guidance through the application, taking into account that most Hyves users will not be familiar with a such an information visualization and might get lost.

Preference navigator (5)

At the upper end of the screen, above the visualization, we placed the buttons of all preferences of the selected profile. The number of buttons equals the number of preference fields the user entered in his Hyves profile. When clicking on one of the buttons that particular category's preferences become visible.

Page title (6)

We decided to place the page title window at the bottom of the screen so as to remind the user which screen he's looking at. This component remains at the bottom of the browser window, so regardless of the screen resolution the title is always visible.

Application flow

The Vriendjespolitiek.net system consists of four different visualization screens, each with its own set of features:

1. Overall match: the application starts with a compatibility match based on the total fields submitted in the user's Hyves profile, compared with the political party leaders' pals on Hyves. The compatibility's extent in the visualization indicates the percentage on mouse over, as well as in the bar chart at the left hand side. The bar chart is always present behind a tab, so succeeding pages allow a comparison with the initial status, thus disclosing in how far the current screen's matching deviates from the overall match.

2. Preference match: this page is accessible via the preference selector at the top of the screen and shows your preferences related to the politicians'. This match is solely based on how many politicians' pals selected the same preferences in their profiles. The bar chart displays this new match; by clicking on the tab the overall match will appear allowing the user to compare matches. Hovering over politicians' nodes will display the match's percentages, as well as the number of users accounting for this percentage; hovering over preferences will show how many pals of all politicians indicated this preference in their profiles. To proceed to the next screen the user can either click on one of the politicians or click on one of the preferences. The following two screens apply the principle of recursion: they provide a world within worlds.

3. Politicians' top preferences: when the user clicks on one of the politicians he will see the top 20 most popular occurrences of the previously selected preference. Hovering over a preference will show the number of pals choosing this preferences, the corresponding links to other preference nodes show the combination of two preferences chosen in one single profile. Because this screen is not user related, the bar chart will disappear as it is not relevant to this screen. To enable advanced exploration of these top 20 preferences, we decided to implement a new navigation tool here by adding the politicians' selector at the top of the screen. This allows easy checking of the top 20 preferences of all party leaders , comparing them and perhaps discovering interesting facts or conclusions. Small multiples of all politicians would of course have been preferable, but as all maps are generated on the fly, this unfortunately would have been too computationally expensive.

4. Relationship between preferences: when (at the end of step 2) the user clicks on one of the preferences he will see how the selected preferences link to others from that same category. This depends on the frequency of one selected preference being connected to another preference within the same profile, the higher the frequency, the higher they rank. In this screen the party leaders appear among the preferences according to the number of pals sharing the displayed preferences. Both chart bar and politicians' selector are not relevant in this screen and will therefore not be displayed.

4. Implementation

4.1 From funcionality to implementation

This section will discuss the functional requirements, mentioned in chapter 2. The main goals - voting recommendation, browsing attributes and analysing a users' position among friends of politicians - are supported by a number of elements.

The voting recommendation is deducted via a divide and conquer technique, for categories separately and for an overall point of view. Unlike a normal mean number of friends, the divide and conquer technique looks only at the politicians' friends that filled in preferences for a certain category. All 100 percentage points are only divided among those politicians and are related to the number of friends that have the preferences filled in in one or more categories. This effectively shows a more distinct match and provides better scaling on the number of friends, which makes outliers more prominent. The politician you are closest related with might indicate your voting behaviour. However, Vriendjespolitiek.net does not give a substantive voting recommendation, but rather a match based on the personal preferences of friends of politicians. Browsing might be the key activity in exploring the data set. Users can browse through the set by clicking on attribute categories, politician nodes and attribute nodes. The bar chart with the overall match or the attribute category match percentage, the mouse overs and the information screens aid the user in understanding the numbers and the possible options for further browsing. Analysing the users' position among friends is made possible by constructing graphs in which the politician, user and attribute nodes are connected with edges.

Among other functionalities is to see how a profile is related to friends of politicians and to view and compare preferences, which is implemented by the possibility to fill in a (public) hyves profile (or a profile of a friend). Comparing and viewing interests can be done by the user by browsing the site through different users, politicians and preferences.

Among the attributes that can be displayed are categories that can be filled in on a hyves profile, there are demographical categories like: age, birthday, living, gender, status, occupation, location and hometown. Furthermore interests like music, books, movies, tvshows, gadget, religion, club, passions, company, food, game, hero, language, media, brand, travel, school, sport and living can be chosen to compare your interests with friends of politicians. All these categories can be displayed if they are filled in on the profile. At last some categories are scraped for backend usage: user id, name, about, number of friends, photo url and username.

The attributes can be discovered further in the graph by clicking on the attributes. The top 20 attributes of the category and/or the chosen attribute is displayed among the politicians. Mouse overs provide extra information about the amount of friends of politicians that filled in that particular attribute.

It is possible for users to see a quick overview about the overall match statistics with the politicians' friends in the bar charts, together with the match statistics of a chosen category.

For design and understandability requirements we chose to make the edge thickness and node size dependent on the amount of friends, so it is easy to see where there are many

relations or friends of politicians that filled in a certain attribute. Next to that, for each attribute category icons are designed to distinct the attributes clearly. Mouse overs add valuable information about nodes and the number of friends that filled in certain attributes and the match with the users' profile.

4.2 Data analysis

The data set is derived from online social networks, focused on the Dutch party leaders' friends, for the current application we used a subset of 600 friends per politician. We use the biggest social network in the Netherlands, Hyves, which is mainly populated by 15 to 30 year old Dutch and the type of data acquired is the connections between friends of politicians and their profiles or interests. The database however has been structured such that we can easily fill it with profiles from other social networks like mySpace and Friendster.

Custom scrapers have been developed to scrape friends of Dutch political party leaders on Hyves. Currently only 8 Dutch political party leaders have a publicly accessible profile which we can use, so other politicians, like Bas van der Vlies (SGP, no profile) and Geert Wilders (PVV, private profile) are not present in the data set. For the politicians and all their friends, the profiles and friend connections are stored in a local relational database, with columns for each possible field of the profile. Thus a multidimensional data set is constructed - currently consisting of 32 cases, i.e. fields from the profile or columns in the database. Most of the data is nominal, but eventually makes an ordinal set after all data is obtained, normalized, cleaned, and classed. As Hyves has ambiguous attribute fields that can be filled in in both English and Dutch, they are mapped to each other, so only one instance of an attribute is added to the database.

The scraped profiles are inquired by the user when a users' profile is filled in and compared with the friends of the politicians. Scraped preferences of politicians' friends form a particular demographic profile for a group of friends per politician and that profile is compared to that of the user.

4.3 Techniques

The application is mainly built in PHP, the graphs are drawn using Scalable Vector Graphics (SVG), Javascript is used for infoscreens on mouse-over and AJAX for simultaneously loading the different components of the site (image 9).

Users can fill in their Hyves profile user name on the website to start. This call is being handled by AJAX and sent to the scraper. The scraper is built in PHP and scrapes the hyves profile of the user. The same scraper is used for filling the database of friends of the Dutch political party leaders. The users' profile is placed in a session for faster processing for further actions. When a profile is found the filled in attributes of the person are displayed and form a navigation structure, from where your profile can be compared with the profiles of the friends of the politicians on the different attributes. The comparison with the friends of the politicians from the database is done in PHP and sent to AJAX, which transmits the data to the SVG, which displays the graph and the mouse overs, and to HTML, which displays the profile, navigation, stat bars and info screen.

The formation of the graphs is made possible in PHP in combination with SVG. Previously it would have been realized with Javascript, but Javascript could be too slow as it works client side, which may result in long processing times for clustering. By having all calculations

executed on the server the calculations take less time. Therefore, we chose SVG for drawing the nodes and edges. The positions of the nodes are calculated by a force directed or spring-mass based algorithm in PHP, in which a number of iterations calculate the best position between the opposing nodes and attracting edges. The positions are passed on to the SVG and are displayed on the canvas.

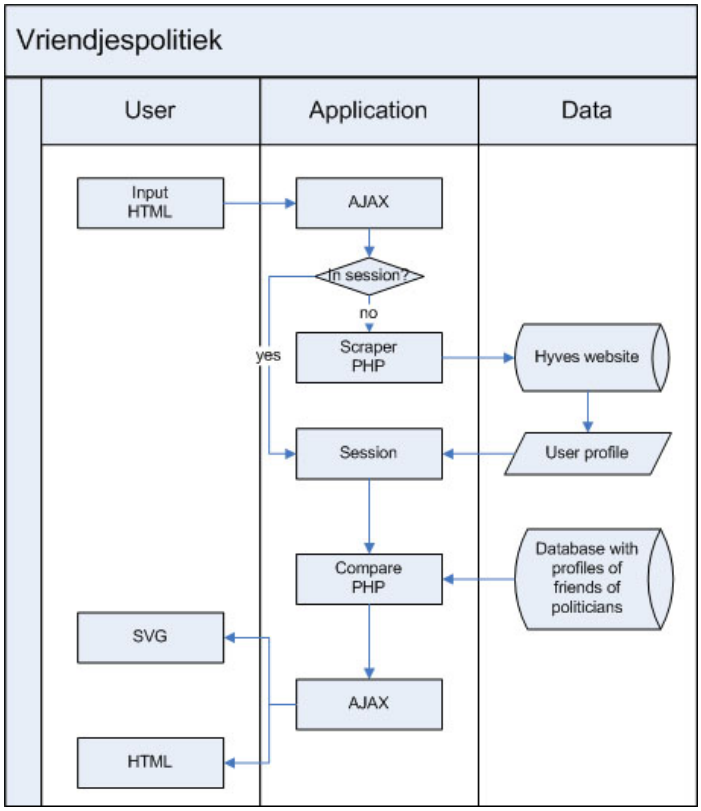

Image 9. *Flowchart of techniques*

4.4 Programming choices

Vriendjespolitiek.net shows the overall percentage of resemblance between the group of friends of politicians and the user in the opening screen (based on a divide and conquer technique). Interacting with the navigation brings the user to a more detailed look in which preferences themselves will appear. Users that have attributes in common with friends of politicians form relations between the edges. For more clarity node and edge sizes grow as more friends of politicians share attributes with the user, like Collins and Carpendale (2007) show with their edges in VisLink.

Heer and Boyd (2005) point out some highlights of Vizster, which includes connectivity highlighting and filtering. Vriendjespolitiek.net uses these techniques as well. Connectivity highlighting is implemented as a mouse-over, the edges and nodes that are linked to the currently selected node are highlighted in orange. Filtering is applied by the selection categories, so only one category is displayed at a time. Also the nodes can be selected for extra information about a particular node, like an attribute or a politician.

Vriendjespolitiek.net shows a limited amount of nodes in the graph, with a maximum of 20 attributes, 8 politicians (who provide a public Hyves page) and one user node. This prevents

the canvas to be too crowded with nodes, which can create a lot of overlapping, a common problem in force directed lay outs. When friends of politicians do not have a certain attribute in common with the user, the unconnected politician nodes are placed in the peripheral area (Shen et al., 2006). Nodes themselves will not overlap each other, however, the node texts can overlap other nodes as the texts are placed next to the node in stead of inside the node. Texts in the node would anyway overlap their own node as the nodes slim when not many friends of politicians share an attribute. An overlapping problem might be formed by the edges, as they can increase in size and with a large number of edges they will overlap each other. However, the functionality of the thickened edges are more important than the possible overlap problem.

Yi et al. (2007) name seven categories of interaction techniques that are commonly used in Information Visualization:

Select: mark interesting items
Explore: show something else to explore the data set
Reconfigure: show different arrangements of the data
Encode: show different representations of the data
Abstract/Elaborate: show more or less detail
Filter: show something conditionally
Connect: show related items

When applied to the vriendjespolitiek information visualization we can say that all interaction categories are supported, except reconfiguration.

Selection of interesting data items is possible by searching for a persons profile. His personal picture is displayed on the canvas, together with the politicians. Marking of certain items however is not possible. Only 8 politicians and the filled in profile's photo appear on the canvas, which should give enough overview.

Exploring techniques are used to examine different subsets of the data. The different views of vriendjespolitiek (general view, attribute view, politician and top attributes view) provide the possibility to explore the data of politicians' friends, with the focus the attributes. Also mouse over info screens provide extra information about the politicians' friends.

Reconfiguration of data is not applied on the vriendjespolitiek visualization, users can not deliberately change the perspectives of the data views.

Encoding, showing the data in different representations, is applied in the data view at all times, by showing the data in the graph like presentation in the centre and the comparison bars at the left hand side, a principle also pointed out by Collins and Carpendale (2007) as coordinated multiple views: the percentage of similarity between the user and the politicians friends is displayed in the graph and in the bar chart (where a attribute view can be chosen and an overall view).

Abstracting and elaborating is used in the different views, in the general view the similarity between the friends of politicians and the filled in profile is displayed. When an attribute category is chosen, a more detailed look into the data is presented. The comparison bars provide a detailed view for the chosen attribute as well as a general overview. Also the mouse overs provide elaboration of the information about a node.

Filtering is used by choosing the different attribute categories. The top attributes of the politicians' friends can also be chosen for filtering on an individual politician.

Connection is data used in the two different views, as being pointed out in the encoding interaction category. The pictures of the politicians that are depicted in the graph correspond to the pictures in the comparison bars. Also when the top attributes of one politician are chosen, there is a connection between the displayed politician and the row of politicians at the top, where the top attributes of other politicians can be chosen.

5. Extensions

The Vriendjespolitiek.net website can be extended with extra features. Heer and Boyd (2005) point out linkage views, focus and context, network centrality and community structures. In Vizster, linkage views highlight intermediate friends between nodes, which might be a valuable addition for vriendjespolitiek.net, e.g. to see how attributes are linked together via a politician.

The focus and context principle shows the most important nodes centralized and increased in size, while less important nodes are reduced in size and placed in the periphery. Within vriendjespolitiek.net this is not applied, but might be considered when more nodes would be displayed. We chose to let the node sizes, the edge thickness and edge distance to the central node be dependent on the amount of friends that have the same attributes filled in, rather than to let it depend on the focus. Peripheral nodes are nodes that are not connected in any way to other nodes.

Centrality, an egocentric view of the most important node(s), is only applied in the first overall view, when the user is displayed in the center, with the politician nodes around. In other views no nodes are centralized, as they are positioned randomly until converged. The politician top 20 view might centralize the politician, but that is the result of the algorithm, rather than deliberately centralized. However, centralization can aid vriendjespolitiek.net in finding the most important node(s) more easily.

Communities might aid vriendjespolitiek.net in understandability when clusters of politician and attribute nodes are formed. This might form clusters of left or right wing politicians, which can be very interesting.

Collins and Carpendale (2007) use semi-transparent curves that appear stronger when edges are bundled. Vriendjespolitiek.net can also use this technique, next to the edge thickness, to elaborate the amount of friends, the more friends, the stronger the line color. Also, transparency can solve overlapping problems.

Within VISLink, Collins and Carpendale (2007), use explicit linking between two graphs on different canvases. This is not useful for Vriendjespolitiek.net as it probably is computationally too expensive for a web based application and we only use one graph. Linking from the graph to the bar charts which only state the percentage similarities would only confuse users. It should be clear that the photos of politicians represent the same (group of) persons in the

graph as well as in the bar chart. Explicit linking should therefore not be necessary.
Leung and Aerley (1994) stress the role of distortion oriented presentation techniques, like fish eye distortions, bi- and polyfocal projection and perspective walls. For Vriendjespolitiek.net distortion would not be applicable, because presenting graphs is done best in a two dimensional environment (Börner, 2002).

Further extensions of the application can be sought in the seven tasks that information visualisation should support (Shneiderman, 1996). The tasks filtering out uninteresting items, details-on-demand and viewing relations are present in Vriendjespolitiek.net. But Vriendjespolitiek.net can be extended with an overview of the entire collection. In Vriendjespolitiek.net not all entries can be displayed in an overview, while not sufficient space is available. However, the overall match with the politicians friends can always be found in the bar chart.

Zooming in on items of interest for extra information is possible with the mouse over information, or by clicking on a node, but when clicking a node, the global context of the previous screen can not be retained. Zooming, in this case, is rather a form of recursion, because it results in an other object space. For extra overview, Vriendjespolitiek.net may be extended by a general view on all the nodes.
A serious weakness may be the absence of a history mechanism, by which the user can undo actions or hit the back-button. Due to the use of Ajax and SVG, the browsers' back-button does not work, as all actions are called within the site itself.

Next to literature related extensions, another list of extensions is displayed below. Some initial plans were postponed due to time constraints and during the process some other options were discovered.

Add and delete preferences
A nice feature that can be added is adding and deleting preferences to or from your own profile. In this way you can see how your position changes in the graph in relation to the friends of the politicians. E.g. your political preference can change when you are 10 years older or when you fill in classical music in stead of R&B.

Movable sliders to add or delete distinctive preferences to your profile
Above feature could be turned around as well, when you want to come closer to a certain group of friends of a politician the system should be able to suggest which preferences should be added to or deleted from your profile, by dragging the slider of a politician in the bar chart to a higher match percentage.

Animations when altering preferences
When a view is changed or attributes are added or deleted an animation should be played to indicate the changes between the position of the 'old' profile and the changed position on the canvas.

Show more categories in one view
Now it is only possible to show one preference category at once, where it would be nice to have more categories at the same time. By showing more categories in one view, the user can discover relations based one more than one attribute. For example, a combination of age and books can lead to more insight in the dataset, than solely age or books. Also categories that now have little functionality, e.g. age or relationship, can add insight.

Toggle politicians on or off

When you are only interested in the friends of one or a selected group of politicians (like only the politicians in the coalition), it should be possible to toggle certain politicians on or off.

Edge mouse overs

Mouse overs are now only displayed when hovering over a node, but a mouse over over edges would gain more insight about particular relations between nodes, like '12 friends of politician X filled in this attribute'.

Canvas size

As displaying graphs with SVG provides advantages, it has its' downsides as well. The canvas size is fixed (it depends on the screen size of the user), so it is not possible to scroll downwards or sideways, which makes the canvas relatively small. A scroll opportunity would create more space for better positioning and the possibility to display more nodes. However, scrolling also has its' disadvantages, as the user can get 'lost' in the extra space. By using the concept of overview plus detail, the user is able to zoom in on the canvas, while maintaining overview of the overall canvas in an extra overview window. The zoom function lets the user discover all the details, while the overview prevents the user from getting lost.

Possibility to hide top and/or left bar

The fixed canvas size might be aided by the possibility to hide (and show) the top and/or left bar, so the canvas can be recalculated and displayed bigger.

Login with private profiles

Only public profiles are nowadays 'scrapable', but more visitors would be attracted to visit the site if a private profile of a user can be scraped. Also friends of a user with a private profile may be scraped, when private profiles can be scraped, when a password is provided by the user. In some profiles specific categories are not visible to public profiles. The user is now asked to fill in a password when the whole profile is private, but when only some categories are private, these categories are not taken along. A standard login functionality would let the whole profile of the hyver to be scraped and the specific private categories to be taken along. By doing this new relations can be discovered and more extensive matching can be done.

Extension to other social networks

As the scrapers can scrape several social networks and all preferences of a users' profile are stored in a local database it is possible to apply Vriendjespolitiek.net on other social networks like MySpace or Friendster. This opens possibilities to compare interesting (political) people with users of social networks, for instance a voting recommendation can be made for the US elections.

Compare profiles to other type of person

First of all, one could compare his/her profile to other politicians than we do now. Now it is only possible to compare your profile to party leaders, but there are a lot more politicians available. Second, Vriendjespolitiek could be extended by comparing profiles to other type of persons. For example, one could compare his/her profile to celebrities.

Compare combined profiles to politicians

A nice extra functionality could be to combine profiles and compare the combined profile to politicians. By doing this someone is for example able to see how his group of friends is matching to different politicians.

Data normalization

On hyves, people are able to fill in their own preferences in their profile. A problem encountered here is that there are a lot of misspellings in the profiles. Also people use synonyms, while meaning the same thing. The application could be improved by normalizing terms. By doing this the match can be calculated more precisely.

6. Evaluation

The ideological goals, as set in chapters 1 and 2, subtly but adequately appear in Vriendjespolitiek.net. While our ideas are explicitly brought across in the frequently asked questions, we also leave it to the user to find out for himself what our intention is; we give him a chance to be confronted with the data introduced into and derived from social networks.

We think we succeeded in playfully raising awareness of public display of data bodies, and in showing how the categorizing mechanism of voting recommendation systems work. As Albrechtslund pointed out, we should use the new architecture of communication to start rethinking older concepts. Without calling the publication of one's data body 'evil' or ignoring the importance of online networks, we tried to raise awareness and critical reflection on what is possible once information is connected and available to all.

By using a Hyves network as "kieswijzer" (voting recommendation) we addressed all four of Boyd's points, i.e. persistence, searchability, replicability and invisible audiences, in a critical but not negative way. Searchability and invisible audiences in particular are a clear focus for the users of Vriendjespolitiek.net. Persistence could be interesting to be researched further if the project would actually be running over a longer period of time; a simple history button could then show the political sustainability of the various politicians' pals.

Albrechtslund, just like Boyd, is aware of the down-sides of the online networks' surveillance possibilities. But he addresses this surveillance concept as a user-tool. This is important in Vriendjespolitiek.net as well. Since the application itself is based on a voluntary social network where pals hang out in their free time, it is clear that everything users put in their profiles, is 'identity construction' rather than anything else. One of the tools that unfortunately could not be fully developed because of a lack of time, allowed the user to adjust his preferences in order to change his voting recommendation. Perhaps so much the better so, or else Vriendjespolitiek.net users would forget about persistence and think that their complete data body could be modified at will. The tool's interesting aspect highlighted that the political outcome could be influenced at any time, proving the ambiguity of these voting recommendations. By avoiding clear links to content-related issues such as party programs, the vulnerability of politics and political choices in the light of peer pressure and trend setting was demonstrated.

By means of the network used by the target group itself, and by connecting it to an actual and close by subject as their own politicians, we offered them the chance to discover this all by themselves. Since the facts are so basic and stand-alone - their pals, preferences and well-known politicians - it is easily understood how their data all of a sudden live an online life of their own, creating their own truths and consequences.

The keyword here is awareness, for the application's functionalities but also for those related to online network environments. Vriendjespolitiek.net has now become a fully operational application with a large number of the initial concepts which sprang up on the project's day one brainstorming session. The majority of the functional goals were achieved. The major shortcoming is that at this moment we only use data of 600 pals per political party leader and that for some politicians like Marijnissen or Wilders we do not have data. The application's flow, as described in the functional design halfway the project, has been finalized and all screens are available in the application's current form. The visual design is implemented and does resemble the original sketches, but could be tweaked somewhat if more time were available.

Strengths

The algorithm used to position the visualization elements across the screen also effectively clusters related elements. From the example below it appears that the best matches are centered in between politicians, preferences not or less frequently linked to politicians' pals are put outside of the cluster. Preferences with a stronger connection to one politician rather than to another will pull the preference-node towards the one politician; in the example below (image 10) the show "24" is stronger connected to Rutte than to Bos.

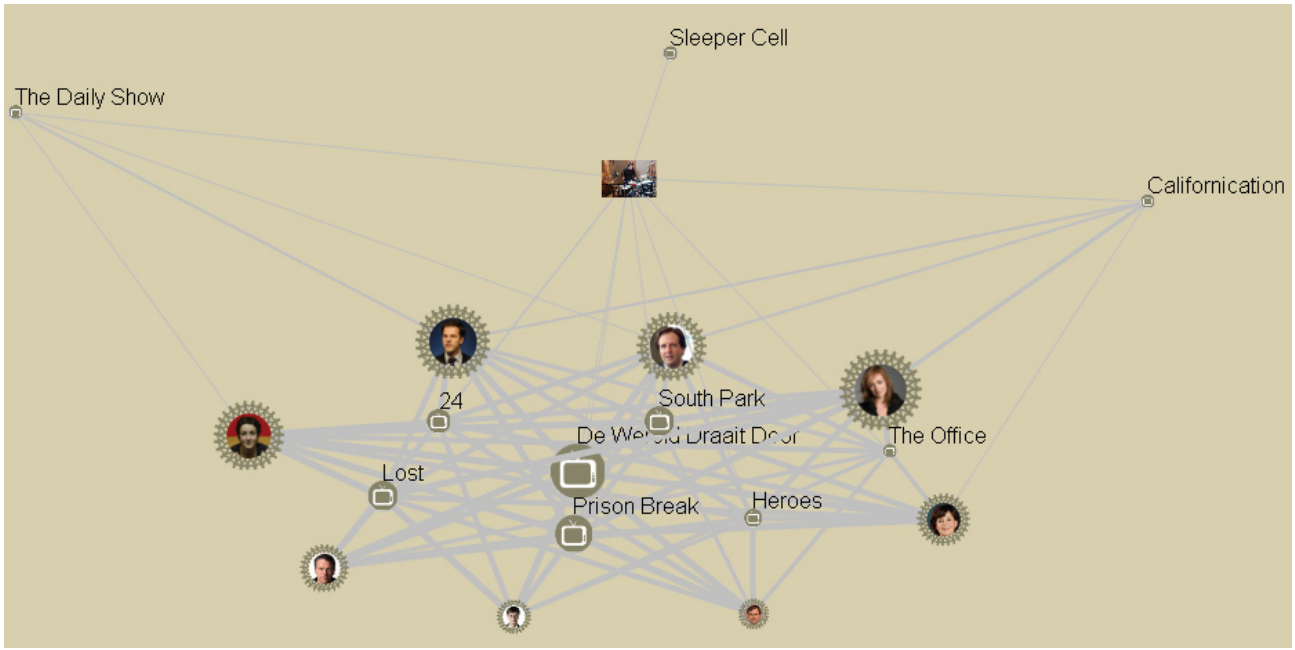

Image 10. *Clustering*

The entire application has a low entry rate and is very user friendly. This was our objective, as the average Hyves user is not familiar with information visualization inexperience. We wanted to thoroughly illustrate the screens and the data the user sees, but at the same time limit the flood of data for the user. The visualization's interaction is very intuitive; hovering over nodes immediately shows data tips containing additional information, as well as the highlighted related edges and nodes triggered via the brushing principle.

The application has a strong underlying ideological concept, but this does not interfere with the playful aspect of matching with politicians. We tried to intertwine the fun of using social networks with educating digitally active teenagers and confronting them with the possible dangers of the use of their data body. Not presenting the user fixed data is considered to be another core value; we intended to offer the user a personal experience driven by his own exploration.

Weaknesses

One of the application's requirements is that the user must complete a Hyves account. In the beginning we thought of providing a second option, whereby certain preferences could be indicated and consequently linked to the data scraped from Hyves, but due to a lack of time this feature did not make the final application. As the application is specifically aimed at the Hyves network and its users we do not consider this to be a real shortcoming.
Weaknesses already corrected before the deadline are: the use of icons for the preference nodes, and the clarification that we use politicians' pals to create the matches. Because of the icons the application is more visually appealing, but they are also an asset for the overview of the screens, especially when looking at the preferences. The pals' circle gathered around the politicians' picture, always reminds the user of the fact that he is not compared with the politicians themselves, but to their electorate . The illustration takes away the confusion that the politicians' pals would do the matching.

The initial match, the one between the user and the politicians' pals, would in the beginning show very little difference in percentages. The algorithm for the match worked, but the electorate's profiles were not distinct enough in preferences to make the match more accurate . The project's last week produced another algorithm according to the divide and conquer technique; we check how many pals per politician completed their preferences and spread the votes over them, the remaining politicians not getting any. The number of votes per politician are related to the number of pals that completed their preferences. This indeed makes the match more distinct. The occurrence of clutter when looking at a large number of highly popular preference nodes remains a problem with visualization. The edges show a dense and concentrated pile of lines; navigating or exploring data becomes extremely challenging.

Although we tried very hard to get our ideology across, users might still not see or understand. Even though we would like all users to draw a lesson from the application, we realize that for many the underlying theories will remain in the dark. Since Vriendjespolitiek.net is an exploratory data analysis, we also want to leave the conclusions and lessons drawn to the user's own responsibility and resourcefulness.

Improvements

If we had had more time, knowledge or resources we would have added and changed are the following:

1. Identity construction: we would have liked to implement the option that preferences could be added or removed from your profile in Vriendjespolitiek.net to influence your matching with the politicians' electorate. This could show the direct relations between politicians and preferences, but could also bring about a recommendation to add a set of preferences to your Hyves profile to match a certain politician. As this did not form part of our application's core functionality it was parked on the wish list.

2. Larger data set: For an even more accurate match a larger dataset than the 600 people per politician we now scraped would be necessary.

3. Adding pals: in the end we would have liked to have the user add his personal pals to the visualization. This would make clear how his pals rate in relation to politicians, but also how he relates to his pals on the basis of his profile.

4. Subtracting default suggestions: in the future we could look into the default suggestions and subtract them from the data set as so as to see how much and what is individual expression. As explained by Elmer (2004, 26): "Responses to profiling technologies, as a whole, must take into consideration the more pervasive 'default culture' - the systematic incorporation of technological choices in absence of consumer responses. These default settings inevitably entrench economic and political interests."

5. Evaluate: we would like to see how the application is used and perceived over time, and if needed to update it, to normalize the data, improve the visualization or to update the content, i.e. regarding politicians. This could for example be done as shown in point 7.

6. Persistence: show how our political preferences change over time. By adding a timeline we could view how our political advice would change over time in view of an updated profile or of the changes in the electorate's preferences.

7. Poll: it would be valuable and etertaining to create a poll where the user could indicate if the recommendation made by Vriendjespolitiek.net resembles the user's actual political spectrum. How close did we get to his actual political choice by creating a recommendation solely based on non-political preferences?

8. The most important feature absent at this time however is that it is impossible to click the politicians in the first screen. This should be possible, so that the user actually sees in how far he is compatible with a certain politician on the basis of the combination of all his preferences.

"We leave data everywhere we go. It's not just our bank accounts and stock portfolios, or our itemized bills, listing every credit card purchase and telephone call we make. It's automatic road-toll collection systems, supermarket affinity cards, ATMs and so on. It's also our lives. Our love letters and friendly chat. Our personal e-mails and SMS messages. Our business plans, strategies and offhand conversations. Our political leanings and positions. And this is just the data we interact with. We all have shadow selves living in the data banks of hundreds of corporations' information brokers -- information about us that is both surprisingly personal and uncannily complete -- except for the errors that you can neither see nor correct. What happens to our data happens to ourselves." (Schneier 2008)

"In a networked society each individual's data has value." (Ito 2005)

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