

Data Analysis and Visualization of the City Councils

Kristýna Zaklová*

Abstract

Municipal politics affect our daily lives. However, data regarding the decision-making of representatives is not accessible easily. Therefore, a data model was designed for information about City Councils and a system which provides understandable dashboards from this data and offers basic overviews as well as more advanced analyses. The first demonstration of practical use was done with data from the real votes of Brno City Council (*Zastupitelstvo města Brna*) members. The next step is to extend the solution to other municipalities because it can increase transparency of the state administration, awareness of citizens and their interest in this issue.

*zaklova@vutbr.cz, Faculty of Information Technology, Brno University of Technology

1. Introduction

Representatives elected by citizens make decisions that affect us all. Even so, people have little interest in municipal politics and whether politicians keep their promises. There is not yet a single format for voting data, but its creation is essential for developing tools to strengthen democratic processes [1].

Since there is no standard for voting data yet, the core of the solution is to design a model for such data and a tool which transforms the data to a form, which is understandable by the general public. A bonus is ensuring the availability of such datasets from different municipalities in the same format, enabling their further use – whether in the academic, state or commercial sphere.

Individual municipalities typically have data about their council presented on their official website. The relevant subsection of the website contains a list of council members, sittings minutes (usually as PDF files) and voting protocols. No summary statistics are available, records cannot be filtered by advanced criteria, voting protocols cannot be sorted by category, etc. This, unfortunately, impairs readability and puts information out of context. Some cities have already started to deal with this situation, and few solutions have been created with the public's help¹, but there is no initiative for a global solution yet.

¹E.g. the core of this solution was created during a hackathon: <https://hlasovani.mmdecin.cz/>

The proposed solution brings an input data model and visualization tool. The model defines the structure of the JSON file that can be imported into the tool. The tool displays basic information, detailed reports and analytical views about the council, political subjects, councillors, sittings, and votes through interactive dashboards.

The created system has demonstrated its potential to be applied in practice. Its first version was deployed before the municipal elections in autumn 2022 and brought the citizens of the City of Brno an overview of the activities of their 8th City Council. Now the system includes also support for multiple councils.

2. Poster Commentary

There are 14 regions and over 6 200 municipalities in the Czech Republic. Each of them must have its municipal council [2, 3], which is responsible for administering the municipality and managing finances, issuing municipal decrees, etc. Representatives to this body are elected every four years.

2.1 Open Government Data

Data transformed into a generic model should be provided as open. Open government data are located at the intersection of two domains – open data and government data. It must meet the requirements of free access, use, modification and further sharing [4]; and it must come from the state administration's activities.

Making such data available has many advantages, such as: increased transparency; the ability of citizens and other entities to control government initiatives and their legitimacy; a social and commercial value of data; enabling citizens to participate in management processes actively [5].

Open formal standards [6] are used in the Czech Republic to unify formats and support interoperability. However, there is none yet for this field.

2.2 Voting in Practice and Data Preprocessing

Council members meet regularly during sittings, discussing issues according to a previously known agenda. Voting takes place on individual issues, and a voting protocol is taken from each vote. Larger cities usually have a voting system and voting machines. The systems are parameterizable to a certain extent, so their data outputs typically do not have the same format.

After export, voting protocols are often available in HTML or XML format. Subsequently, there is a check, removal of errors, invalid votes, etc. The valid data is then transformed into the proposed model.

The resulting dataset is in JSON format and it consists of four sub-parts:

- municipality – basic data on municipal self-government;
- political entities – electoral parties (political parties or their coalitions);
- representatives – members of the council;
- council – information about the council for one term, including individual sittings and votes.

2.3 Architecture of Designed System

The designed system has a client-server architecture, where the server part was created in the Flask framework and the front-end in the React library using components of the PrimeReact library. The data is stored in a MySQL relational database.

The tool allows viewing basic information about the council, overviews of political parties, councillors, sittings, and votes. It is possible to navigate between these reports quickly thanks to the interactive graphical elements of the PrimeReact library. Then, the detailed reports show, for example, the attendance of councillors or a summary of their votes in the form of interactive graphs (see Figure on right central part with statistics about the mayoress of the City of Brno – Markéta Vaňková). The analytic views provide the attendance of all councillors and a comparison of selected councillors.

2.4 Demonstration of Practical Use

The City of Brno was the first to join the project and provides data from its City Council as a further step in its effort to share the data from its activities more transparently.

The created dataset includes the last two terms of office (2018–2022 and 2022–2026), 46 sittings and 4 448 votes. The City Council of Brno always has exactly 55 members. They can have a mandate several times in a row, or, conversely, they do not have to be members for the entire term of office. The result was deployed within the data portal of the City of Brno².

3. Conclusions

A solution meeting the stated goals was created and its applicability was demonstrated on real data. The next step is to include other municipalities and city districts. Negotiations are underway regarding the city districts of Brno, and the city of Most has also shown serious interest in cooperation. Discussions about other municipalities will follow.

Further plans also include adding more features to the created tool:

- other more advanced analyses (e.g. correlation in the behaviour of representatives);
- and the connection of the data itself with additional related information (connection of votes with proposals for the points under discussion or with pre-election promises, automatic classification voting by area, etc.).

Acknowledgements

I would like to thank my supervisor Ing. Jiří Hynek, Ph.D., for his support and help. I would also like to thank the employees of the Brno City Municipality for providing the data and for their cooperation, especially Mgr. Jan Zvara, Ph.D. and Mgr. Martin Dvořák from the Data department.

References

- [1] Patricio Del Boca. How far are we from an election data standard? online, 2023. <https://blog.okfn.org/2023/03/13/how-far-are-we-from-an-election-data-standard/>.
- [2] Česko. Zákon č. 128 ze dne 12. dubna 2000 o obcích (obecní zřízení). In *Sbírka zákonů České republiky*. 2000, částka 38, s. 1737–1764.

²<https://www.brno.cz/zastupitelstvo-analyza>

- [3] Česko. Zákon č. 129 ze dne 12. dubna 2000 o krajích (krajské zřízení). In *Sbírka zákonů České republiky*. 2000, částka 39, s. 1802–1834.
- [4] Open Knowledge Foundation. Open definition: Defining open in open data, open content and open knowledge. online. <https://opendefinition.org/okd>.
- [5] Judie Attard, Fabrizio Orlandi, Simon Scerri, and Sören Auer. A systematic review of open government data initiatives. *Government Information Quarterly*, 32(4):399–418, October 2015.
- [6] Otevřená data. Otevřené formální normy (OFN). online. <https://data.gov.cz/ofn/>.