

Legislative Activity in Colombia (Projects) Period 2002 to 2018

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Abstract

In this work, visualization techniques were evaluated to show how the Congress of the Republic of Colombia has labored, regarding the projects that are proposed for four-year periods, covering the years included between the years 2002 to 2018. The information was provided by *Congreso Visible*, who has an expert team in the legislative domain and who provides the databases regarding the projects that are proposed in a legislative period. On this information, three interactive visualizations were developed based on the Tamara Munzner's Framework.

A first task allows to identify the paths through which a project passes since it is presented to get a final state of procedure in the timeline, in this visualization the Collapsible tree idiom was used, it allows to show the information of a hierarchy from the Houses or Commissions of the congress where the projects are presented.

The second task allows compare different features of the projects presented in a given specific four-year period, features as: topic, time that take the projects to be sanctioned or archived, to this task was used a visualization with bar charts interactives.

The third task allows to explore how the authors of the projects are grouped to work on projects in a four-year period, for which we worked with the network idiom, which allows us to see the relationships presented between the different authors forming groups or communities that can be easily detected in the network.

Index Word: Legislative Activity, four-year period, idiom, Congress of the Republic

Introduction

Every four years the citizens elect the congressmen whose responsibility and commitment is to represent the people, under criteria of justice and defense of the common good, without violating the rights of the people, nor the principles and constitutional values in the elaboration of legal norms and the exercise of political control, for this reason it is vitally important that citizens can assess how the performance of the officials elected by their votes and thus issue an assertive judgment on the congressman or again re-elect the official for a different period, this is where Congreso Visible a project of the Political Science Department of the Universidad de los Andes, requires the support to be able to explore and visualize all the

information that they handle regarding the legislative activity, for it was defined that the criterion to work and analyze would be from the point of view of the projects that are worked in each period, what is the time it takes a project since it is presented until it is sanctioned or filed, which are the parties involved in these projects and the authors how they work to develop the projects, taking into account this need of the client will be an interactive data visualization that

allows the user to identify easier data relevant to your daily tasks or follow more structured from a hierarchy that allows to see the traceability of the projects or to see how the authors of the initiatives are related to carry out the projects.

In coherence with the above, this article will be distributed as follows: methodology used and a brief description of the work realized, then the suggested idioms and the evaluation of them is presented, finally the conclusions or insights obtained.

Methodology used and work realized

To achieve an understanding of the client's needs and be able to take them to a natural and understandable language, the Tamara Munzner Framework was used, where in the first stage an abstraction of the data was done, later the abstraction of the main tasks was carried out and finally the idioms that better allowed to represent the defined tasks were selected.

Of the information delivered in tables specified by four-year period with

respect to the projects the attributes worked were `id_congresista`, `congresista`, `cuatrienio`, `partido`, `camara`, `id_del_proyecto`, `titulo_proyecto`, `tema_principal_del_proyecto`, `tema_secundario_del_proyecto`, `fecha_radicacion`, `estado_actual`, `fecha_estado_actual_proyecto`, `tipo_proyecto`, `iniciativa`, `alcance`, on this information a preprocessing was carried out to generate quantitative derived attributes such as the number of projects per author, number of projects presented in a four-year period, processing times of a project from its establishment to a specific state, after obtaining the data in the required format, the defined idiom was implemented for each task.

In order to achieve the proposed objectives, meetings were held with the users, who initially approved the proposed mockups, in the same way the first visualizations were analyzed with them, the proposed observations were collected which were implemented in the final visualizations.

The working team of the project, after knowing the needs of the user determined that the best way to meet the user's expectations, is through visualizations that allow users to see a general context of their data, achieving the following aspects:

- The visualization in general should allow to see the data aggregated by the variables defined by the users and be easily comparable in magnitude, which allows to quickly identify trends,

distribution and behavior of these variables in time.

- The visualization should allow users to easily identify the relationships between the authors who work on the projects together, with the objective of to see the possible groupings and coalitions that are formed around the different initiatives presented by the Senate or House of representatives.
- The visualization must allow the identification of the flow of the projects from the moment of their registry until they reach a final state. With the possibility that the user can select the grouping criteria, which will give him the flexibility to analyze in which step of the ones that are supplied for the approval of the projects, there are greater difficulties of approval and because reasons, or on the contrary what types of projects have better approval opportunities.

Proposal for solution and Evaluation

With the objective of supporting Congreso Visible in the achievement of its objective that is to make the daily actions of the Congress more visible to the citizens of Colombia, we work together identifying the information that could be of interest to them and that corresponds to the period's legislative measures from 2002 to 2018 and can be displayed by data visualization.

The proposed solutions are described below:

The task 1 shows the Collapsible Tree idiom that can be seen in Fig. 1, here you can find the route that follows a project from its presented in a Chamber or Commission to reach some state of final processing, this idiom will also allow knowing which it has been the traceability that a project has had in a specific period, this period can be selected by de user.

Any parent node can be clicked on to collapse the portion of the tree below it, on itself. Conversely, it can be clicked on again to regrow.

This visualization presents a depth of 4 levels, where it is possible to reorganize and select the nodes of each level by means of the "Selccion Campos" box, in this way you can identify the flow of the projects or initiatives according to the selected characteristics.

Making use of "Encontrar", make the collapsible tree also a searchable tree, in the sense that the user can find the route of a given initiative or project, by its ID or by any keyword or expression that contains the "Titulo" or description of the initiative.

If the project ID or initiative is at the last level it is possible to see a tooltip with additional information about this project.

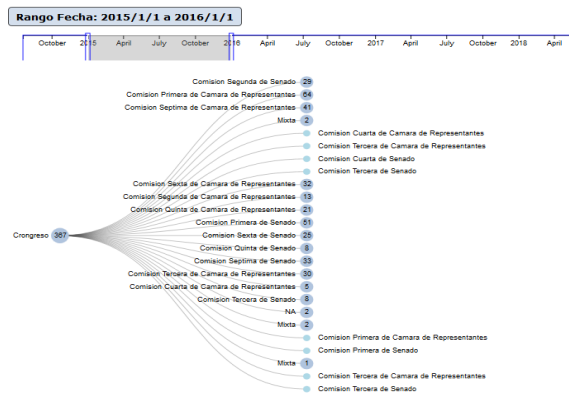


Figure 1. Collapsible Tree

In the task 2, we seek to compare the number of archived and sanctioned projects presented by different characteristics (incoming commission, theme, scope and type of project) in a period of interest. On the other hand, it also seeks to compare the time it takes a project to reach a state (archived or sanctioned), for this purpose, a set of bar graphs was built.

The proposed solution is an interactive visualization that allows:

1. Select the variable to be compared, either the number of projects (archived or sanctioned) presented in the last periods or the time it takes a project to reach a state (filed or sanctioned).
2. Once the variable has been selected, the period of interest (one of the last four four-year periods) and the attribute for which it will be compared (incoming commission, topic, scope and type of project) is selected. When you do this, you will visualize the bar graph

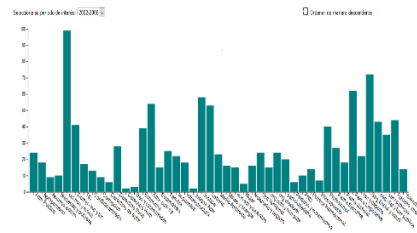


Figure 2: Barchart

3. This visualization allows you to organize the bars in a descending way, which allows you to perform the task of comparing more effectively.

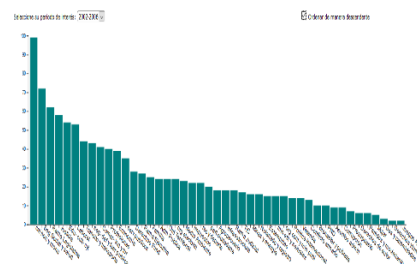


Figure 3: Barchart

The task 3, allows to navigate and explore the different groups or communities that are generated by observing how the congressmen relate to each other to work on the projects for a specific period, the networks were used to show this information as observe in Fig. 4

For the interaction with the visualization, the circles or nodes represent the Congressman, the size of the circle represents the number of projects that person presented, sanctioned or filed according to the filter chosen by the user. The links represent the relationship that there is with another person to present proposals, the width of the line represents the number of projects presented with others Congressman.

There are Filters how to: Choose period: periods of 4 years, from 2002 to 2018, Project status: it allows

filtering the network by projects sanctioned, archived, all the projects of a period or other states, additionally it presents a slider that serves to change the threshold of number of projects presented jointly by the congressmen, in the network the links of those nodes that fulfill the condition are maintained.

It allows to search by the name of a Congressman, the nodes that match the search are highlighted and then they are placed a black border, by clicking on it the other nodes are opaque and you can see only the chosen Congressman and connections with those people who have made proposals.

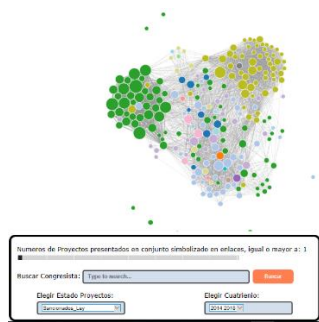


Figure 4. Networks

Conclusions

1. With the proposal to implement a collapsible and searchable tree, the following insights will be identified with the available data set:
 - a. For the period January 2 of 2017 to January 2 of 2018, 487 projects were presented:
 - Most projects were archived with a total of 218, representing 44% of the projects submitted.

- Only 23 projects were sanctioned as law, that is, only 4.7% of the projects or initiatives presented became laws.
- The largest number of archived projects was in the first Commission of the House of Representatives and they were a legislative initiative. Figure 5.

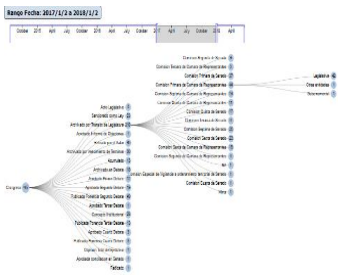


Figure 5. Insight

- b. As of June 20, of this year, only 71 projects have been submitted, of which 8 have been sanctioned as law, that is, 11% and 7 of them are from the Government initiative. (behavior maybe due to the change of government).Figure 6.

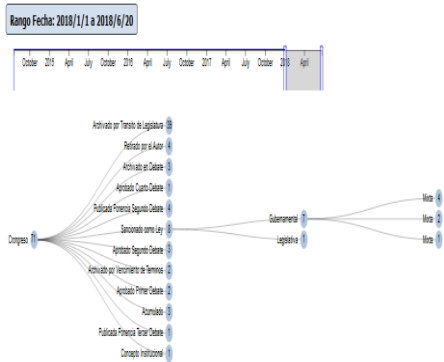


Figure 6. Insight

2. With the solution based on bar graph, the following insights were found:
- a. In the period 2002-2006, the largest number of archived projects were for celebration, honors and monuments, on the other hand, the lowest number of projects archived in this period were of games of chance.
 - b. In the period 2006-2010, the largest number of archived projects were for celebration, honors and monuments, on the other hand, the smallest number of projects filed in this period were PND (national development plan)
 - c. In the period 2010-2014, the largest number of archived projects were for social security and health, on the other hand, the lowest number of projects archived in this period were corruption.
 - d. In the period 2014-2018, the largest number of archived projects were for justice, on the other hand, the smallest number of projects archived in this period were disasters and calamities.
 - e. In the period 2002-2006, the largest number of sanctioned projects are for celebration, honors and monuments, on the other hand, the least number of sanctioned projects are for housing.
 - f. In the period 2006-2010, the largest number of sanctioned projects are of international policy, on the other hand, the least number of sanctioned projects are for housing.
 - g. In the period 2010-2014, the largest number of sanctioned projects are for celebrations, honors and monuments, on the other hand, the smallest number of sanctioned projects are legislative branches.
 - h. In the period 2014-2018, the largest number of sanctioned projects are for celebrations, honors and monuments, on the other hand, the least number of sanctioned projects are judicial branches.
 - i. In the period 2002-2006, disaster and calamities projects are the ones that take longer to be archived, on the other hand,

human rights projects are the ones that take the least time to be archived.

j. In the period 2006-2010, women's projects are the ones that take longer to be archived, on the other hand, the projects of parties and movements are the ones that take the least time to be archived.

k. In the 2010-2014 period, notary and registry projects are the ones that take longer to be archived, on the other hand, copyright projects are the ones that take less time to be archived.

l. In the period 2014-2018, social security and health projects are the ones that take longer to be archived, on the other hand, the executive branch projects are the ones that take the least time to be archived.

m. In the period 2002-2006, fundamental rights projects are those that take the longest to be sanctioned, on the other hand, budget projects are the ones that take the least time to be sanctioned.

n. In the period 2006-2010, family projects are the ones that take the longest to be sanctioned; on the other hand, budget projects are the ones that take the least time to be sanctioned

o. In the period 2010-2014, welfare and poverty projects are the ones that take longer to be sanctioned, on the other hand, budget projects are the ones that take the least time to be sanctioned

p. In the 2014-2018 period, family projects are the ones that take the longest to be sanctioned; on the other hand, judicial branch projects are the ones that take the least time to be sanctioned.

3. With the idiom of networks, the following insights can be obtained:

a. In the period 2002-2006, it is observed that with regard to the projects sanctioned as Law there was the participation of Congressmen belonging to different parties, if we already look at the year 2014-2018, it is seen that these sanctioned projects already tend to be those proposed by

Congressmen
belonging to a single
party. Figure 7.

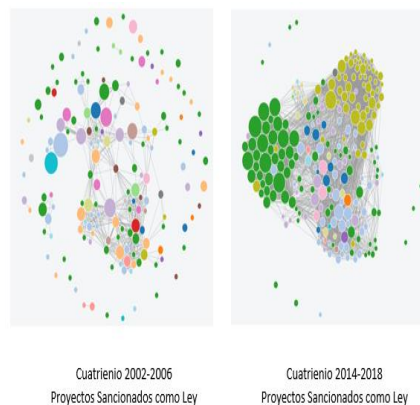


Figure 7. Insight numeral
3.a.

- b. The congressman who presents the most projects is not the one who manages to get most of his projects sanctioned, for example, for the period 2014-2018, the congressman who presented the most projects was Carlos Eduardo Guevara Villabón with 109 projects from the MIRA party, while Congresswoman María del Rosario Guerra de la Espriella from the Democratic Center party who managed to sanction the largest number of projects in that period, 11 in total.

- c. We see the case of Senator Jaime Alejandro Amin (period 2014-2018) who, being from the U party,

worked more in
conjunction with
Congressmen from the
Democratic Center
party. Figure 8.



Figure 8. Insight numeral
3.c.

- d. There are Congressmen like Álvaro Uribe Vélez, Alfredo Ramos Maya and María del Rosario Guerra de la Espriella, who for the period 2014-2018 worked the largest number of projects together, in total 9. Figure 9.

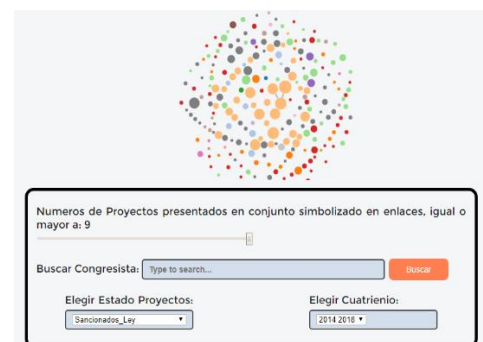


Figure 9. Insight numeral
3.d.

References

- [1] Tamara Munzner (2014),
Visualization Analysis &
Design