

# Portuguese Public Procurement Dashboard

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## Introduction

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Since 2008 it is mandatory the use of electronic platforms for the acquisition of products and services for the public entities in Portugal. Although there are some exceptions regarding the law, it allows the use of decentralized means, for example the email, the vast majority are publicized and processed in such technology.

Electronic platforms are infrastructures built on a set of applications and IT services, needed to the function of the electronic tenders under the Portuguese CCP (código de contratos públicos).

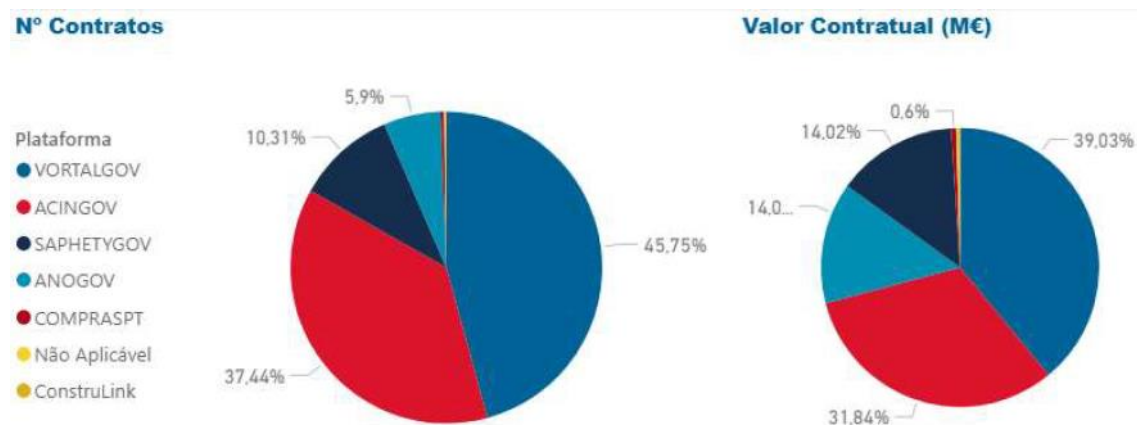


Figure 1: Tender distribution across platforms

Source: Portal BASE (September 2019)

## Market need

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Due to the fact of being mandatory the usage of such platforms, the number of available solutions in the market rose during recent years. Different clients (public entities) using different procurement solutions leads to several sources of information and it is not easy to keep track of everything that is happening.

Currently in the market there are several paid eNoticing services that aggregate this information for the clients:

Upgrade on the basic service level (from the provider of the electronic platform):

1. ACINGOV
2. ANOGOV
3. COMPRAS.PT
4. SAPHETYGOV
5. VORTALGOV

Stand-alone services sold by solution providers:

1. Alertas Negócios
2. Infonalia
3. Construdata
4. ...

In this semester it was reviewed and presented a paper from, Exploration Strategies for Discovery of Interactivity in Visualizations (Tanja Blascheck, Lindsay MacDonald Vermeulen, Jo Vermeulen, Charles Perin, et al... 2019) that explains that although the governments are creating more and more open source datasets to increase transparency, there is still a big lack of data experts to compile this scatter information and to use it on decision making.

This type of eNoticing services are based on three types of functionalities:

1. Dashboard that allows the search of historical information and “present” active tenders
2. Daily notifications by email, SMS or other service about new opportunities
3. Helpdesk to reply to the tenders

In order to bridge the lack of tools of public access, we created this Dashboard to be a free to use tool for companies to review the market historical information in matter of possible clients and current competitors. By defining the type of procedure, category of the procedure (Portuguese CPV) and the region the tender was created the user will be able to understand the TOP 10 competitors, possible clients and the amount they are worth.

## Visualization aspects: an overview of the dashboard

The data set considered and its respective data type is as following:

Tipo de Procedimento	Categoria	Entidade(s) Adjudicante(s)	Entidade(s) Adjudicatária(s)	Preço Contratual	Data de Publicação	Distrito
Ajuste Direto Regime Ge	Serviços relativ	Freguesia de Ronfe	Ambicalendario Unipessoal L	€ 12,600.00	02-01-2019	Braga
Ajuste Direto Regime Ge	Serviços relació	Freguesia de Ronfe	Olga Alice Mendes Ferreira M	€ 7,200.00	02-01-2019	Braga
Ajuste Direto Regime Ge	Serviços relativ	Freguesia de Joane	Malvalunar Unipessoal Lda	€ 5,400.00	02-01-2019	Braga
Ajuste Direto Regime Ge	Serviços relativ	Amato Lusitano - Associaçã	Limpalbi - Serviços de Limpez	€ 5,760.00	02-01-2019	Castelo Branco
Ajuste Direto Regime Ge	Serviços relativ	Freguesia de Joane	Ambicalendario Unipessoal L	€ 17,280.00	02-01-2019	Braga
Concurso público	Máquinas indu	Imprensa Nacional Casa da	DG PRESS SERVICES B.V.	€ 2,748,396.00	02-01-2019	Lisboa

Figure 2: Data and attribute overview

Green color: Represents Categorical information

Red: Represents Quantitative information

Our dashboard is consists of four different components. It was a choice to keep the design simple to keep distractions to the minimum and help the users to read useful information.

The first container on the left, is composed on three dropdown menus and a data field. The user will be asked to set the type of procedure they want to search (if it has a public scope or a restrict one) and the data interval of the contract date. Then, the user can filter by the category of the tender (associated with the CPV of the company) and the region where the tender was intended to serve.

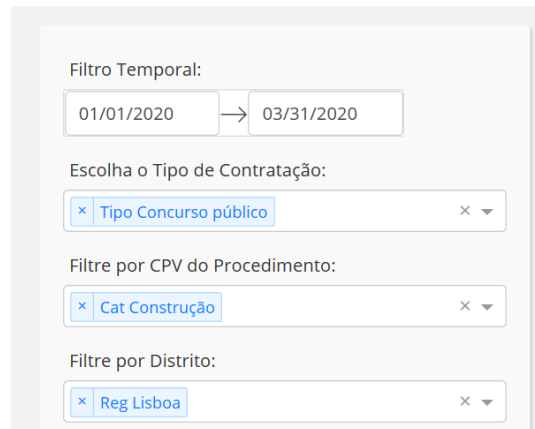
A screenshot of a web interface for selecting and filtering data. It features four sections: 'Filtro Temporal' with date pickers for '01/01/2020' and '03/31/2020'; 'Escolha o Tipo de Contratação' with a dropdown menu showing 'Tipo Concurso público'; 'Filtre por CPV do Procedimento' with a dropdown menu showing 'Cat Construção'; and 'Filtre por Distrito' with a dropdown menu showing 'Reg Lisboa'. Each dropdown menu has a close button (x) and a dropdown arrow (v).

Figure 2: Selection and filter container

There was some data manipulation required for the dashboard to run properly:

- Group the “Acordo-Quadro” type of procedure
- There was a need to retrieve the main CPV from the ones that are associated with the tender (creating the category field)
- All the spatial information was not ready to be used as a search field, needed to be treated to only show the district, there were cases where the tender had a National or International scope and therefore can’t be associated to a specific district.

The second container on the right, is a made with four different numerical values related to the searched typed on the left. Those values increase the depth of knowledge about the market. They show important information on the number of tenders, total value of the tenders, the average value of those tenders, and the number of different clients.



Figure 3: Main figures of the dataset

The third container on the right, will give the opportunity to check the top ten of competitors or possible clients. With a simple tab the user will be able to focus on the required information. The

bar chart presents them in a descending order of value won/spent, meaning the bar at the bottom will represent the most strong competitor or most interesting client in the search field.

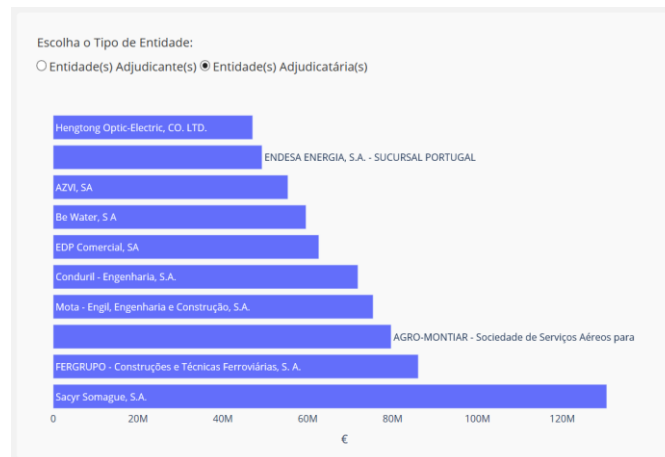


Figure 4: Barcharts with top competitors and top clients

Finally, the inferior part consists of 2 containers. On the left, will be depicted a scatter graph of the evolution of money spent over time. On the right, will be depicted a pie chart that represents the most used tenders to buy specific products/services. This is an important information to understand the scope of specific categories and evolution over time.

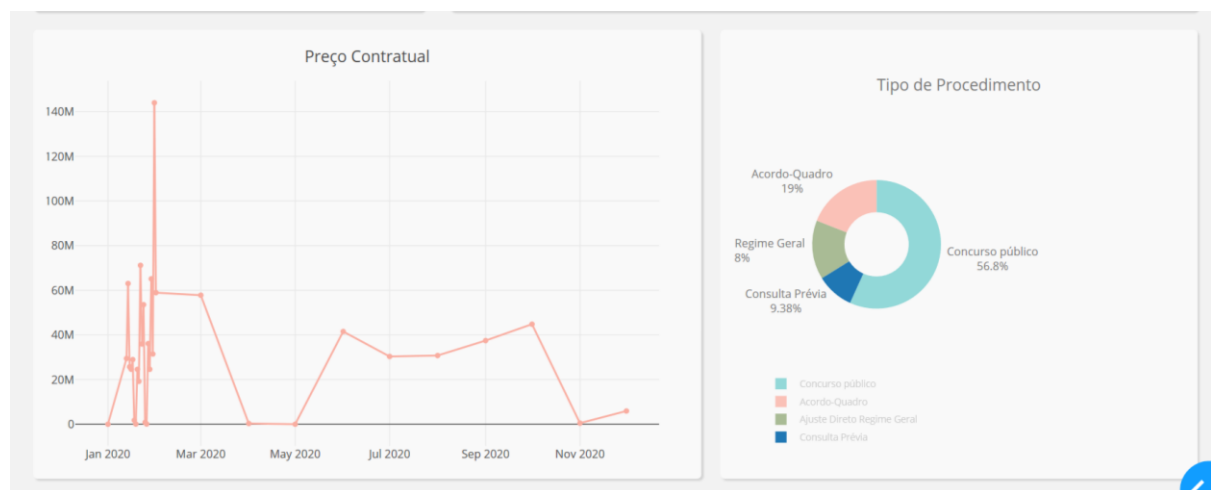


Figure 5: Line chart of evolution of expenditure over time and pie chart of tenders' type

## Technical Requirements of the Project

This project respected the guidelines defined by the docent body of the course Data Visualization of 2020. It was used Plotly with Dash software. In GitHub the entire code will be presented in the file app.py. Also in GitHub there will be displayed the “requirements” containing the packages versions needed to run the code. The folder “assets” with the CSS file and a standard logo, to run the design in our dashboard. The final result was made in two different steps.

1. Run the applications in jupyter notebook and pycharm to view the graphs working with the imported dataset, and code the required changes.
2. Insert the different components into the layout created and transcribe the final code from the pycharm to the GitHub (previously created in a course exercise).

## Discussion

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The fact that some elements of our group have a relevant experience in the public procurement market allowed to easily define the scope of the project and to get a dataset from an open source origin that was essential to develop this application.

The idea of this work is to be continuously developed in the future. There are some interesting information being shared and a concrete need of the market. This project allowed the group to tackle a market need using discussed material during a course, this is very relevant for both professional and cognitive process.

### Future Roadmap

For future work the visualizations available on the dashboard could be improved on the following:

1. Improvement of the filter Labels to improve their readability and usability.
2. Introduction of a stack bar view responsive to the increase of new categories in the search

In terms of information to be included on the dashboard, one should consider:

3. Introduction of information of currently open tenders and not only historical data
4. Creation of connections to the procurement platforms and possible clients
5. Introduction a market intelligence component into the dashboard (most attractive clients, sectors with less competition, etc...)

## References

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- Portal BASE (September 2019)
- Basegov, data set of 2019 and 2020: <http://www.base.gov.pt/Base/pt/Homepage>