

Process book

Welcome to the process book documenting the journey of designing a website dedicated to showcasing the number of 911 calls in Montgomery County, PA. This project aimed to create an informative and visually engaging platform to present the data related to emergency calls within the County. From initial ideation to the final implementation, this process book chronicles the various stages, challenges, and creative decisions involved in bringing the website to life. Join us as we explain the design choices and the thought process behind visualizing the distribution of emergency calls on a map. Discover how this project evolved from a concept to a fully functional website, offering valuable insights into the frequency and patterns of 911 calls in Montgomery County, PA.

1. Path taken for the final result

Step 1 : Research and exploration of data sets

We first wanted to explore available data sets on different platforms and inspire ourselves from existing projects to see what direction we wanted to take.

Kaggle was a very good resource and we explored different themes and data sets. Finally, each team member proposed one idea and we discussed our most favorite and more feasible one. The 911 calls data set in Montgomery County, PA was chosen. We liked the idea and thought that it was pretty original to create a visualization based on 911 calls, or at least we did not see loads of data visualization on this topic.

After familiarizing ourselves with the data set, we wanted to see if there were enough data points, or if the data set was complete before continuing our project.

To do that, we did an exploratory data analysis (EDA) in python with the basics statistics of the data set, and created a first map to see what could be achievable with the 911 calls data.

We filtered, cleaned the data set and chose a time frame from January 2016 to June 2020.

Step 2: Ideation, brainstorming ideas

Following the exploration, we had our cleaned data set ready to work with. Now, we wanted to explore a bit our ideas and what we wanted to achieve or tell the people when they see our website. We asked ourselves : to whom could it be beneficial to see our website ? What additional layers could we bring with our visualizations compared to basic statistics on the number of 911 calls ?

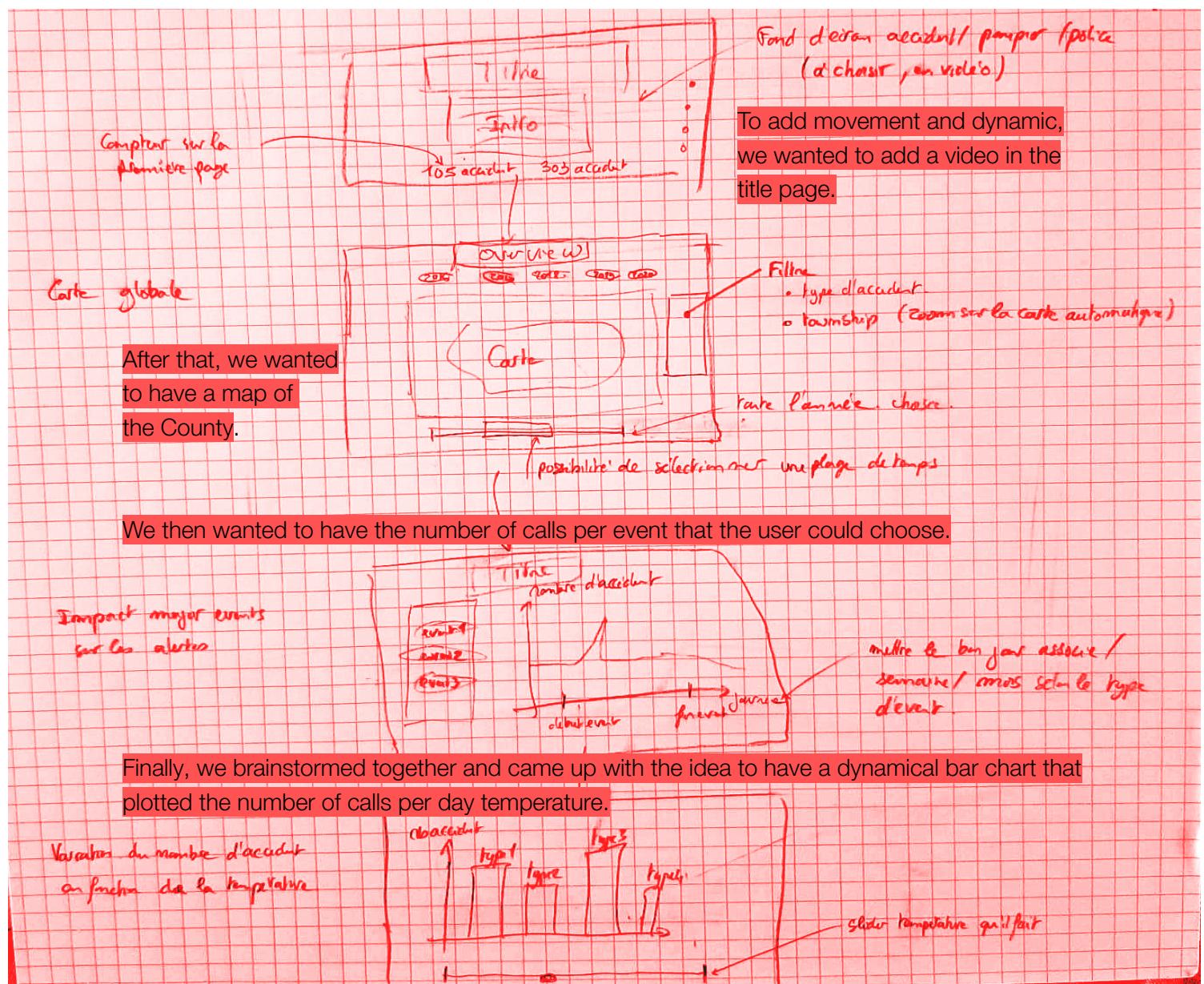
First we imagined that we could create a kind of dashboard for emergency services such as police or firefighters to see interesting data about the calls and to do some forecasting. But we soon realized that not having current data (our dataset stops at June 2020) would likely be an issue. We therefore changed our approach and decided to focus on a completely new target:

the curious persons. We realized that since we were curious about those data, probably a lot of others already asked themselves questions about emergency calls and never found answers. Thus we decided to list the questions we had on the topic, and try to answer them through the storytelling in our website. Our main question was: are there conditions where the number of phone calls is likely to be higher than usual, is it always the same pattern or does the type of calls evolve? And the obvious answer for us was events like natural disasters, or also depending on the temperature the type of calls could be different.

We also had the idea of incorporating a map into our project since we had geographical data. We believed it would be an efficient way to visually represent the distribution of calls across the County.

Step 3 : Sketches of visuals

We then took a pen and paper, and did a sketch of our first ideas.



Step 4 : Additional data acquisition

As we wanted to display the impact of temperature on the emergency calls, we needed to find a way to get the temperature data from Montgomery county. As our timeframe is long, we couldn't imagine getting all those data by hand. Therefore we created the following strategy:

- We first decided to take the approximation that the weather in all of Montgomery county is the same as the weather in Rockville, the center city of the county.
- Then, we created a scraping script to acquire data from a [weather forecaster](#) which also provides history data . Thanks to that, we had 24 points of temperature per day (1 for each round hour) .
- Finally we approximated each call hour to the closest round hour and we were able to guess the weather at the time of the call

Step 5 : Implementation of MVP, [prototyping](#)

After our first sketches, we decided to transpose our pen and paper sketches to static slides on powerpoint, to explore further our visual ideas.

The next step was to translate that into code. Two of the members of the group were new to web development, but were eager to learn. They accepted the challenge to use React, an open-source JavaScript library for building user interfaces (UIs) and UI components. This was a good way to learn directly the state of the art in terms of front end development.

Instead of trying to do all our visualization ideas in one step, we broke each one of our slides to the smallest component possible and started from that. We first created the core of our website with empty slides. Then, we created a minimal principal component of the slide (map, temperature chart, event graph) with only a subset of our data (like 10 rows). We then added little by little child components like a slider, filter panel or buttons and gradually built up each one of our slides to their final form. This approach enabled us to be sure at each step to have strong foundations on which we could build new things after.

Step 6: [Design](#) decisions and create storytelling

Of course, it's important to have a website that looks good to the user. The placement of the elements were interesting to play with. For example, in the map slide, we had a number of elements to place (map, buttons, slider, filter panel). We had to be careful not to overcrowd the slide and make sure the main message or information we wanted to show did not get lost.

The order of the slides were also made to be from the most global information (visualize the general situation using the map) to a more detailed information (event, and then temperature). For the typography, we selected more of a "modern" font to create a nice website, so we used the "apple system" font, which is more round and pleasing to look at.

It was nice to have some variations within the website: we created the introduction slide to be quite different from the others (background dynamic color), even though the rest is pretty homogeneous. The video adds some dynamic to the page and captures the user's attention.

We furthermore added transition slides that inform the user what the content of the next slide is going to be about. This contextualizes the presentation and creates a smooth transition. Within these transition slides, we incorporated storytelling text to guide and accompany users as they navigate and explore the site.

2. Challenges faced

Acquisition of [data](#)

Since Montgomery County, PA is not the most famous county in the states, it was difficult to have a ready-to-use data set for the temperature. We thus had to scrape data to have the temperatures and achieve our slide.

Coding challenges

Using React for the first time for some of the members of the team, it could be difficult to grasp how the functions of React worked to update the data interactively with the website(use of state, react hooks, ...). It was a challenge at first but once adapted and comfortable with the code, it was getting easier to implement the elements.

Effective design thinking

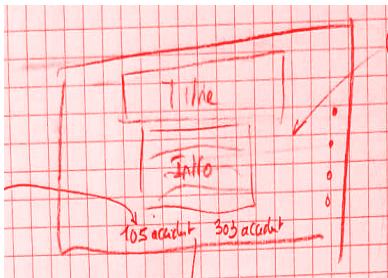
In the course of our academic path, we are not often challenged to create effective, aesthetically pleasing visuals. We are more used to writing papers and presenting data more in a "scientific" way rather than playing with the colors, etc... It was a challenge to think of the elements, style and design altogether while learning a new language. It was therefore very enriching, and we realized the number of ways we could present data and the importance it had on the reader.

3. Evolution from first sketches to real implementation of the design

Comparison of first sketches to final visualizations of the website

From the pen and paper sketches to our final website, we stayed consistent with our initial ideas. It was a perfect exercise because our sketches contained challenges but were feasible. Let us see the evolution from our first sketches to our final website slides:

Introduction slide

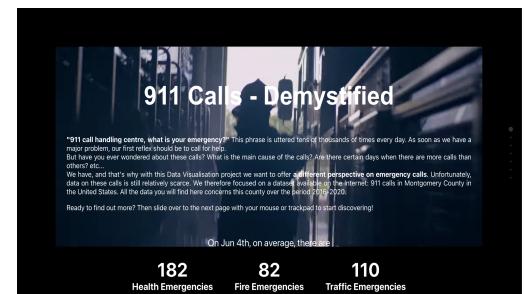


911 Calls - Demystified

A nice introduction about our project, speaking about where our data come, what do we want to provide with that etc...
azertyuiopoiuygfdsqsfghijklmouytrezetyuopkjhgfdswcvbnkhgfdzertyuopjhgfdswcvbkljuytrezetyuopkjhgfdswcvhjk_nbvcxwcvvbn,hgfdzesaertyuopjhgfdcvbn,nbvcxwswdtyujopmoluytrezbnbvcxswertyuopjhgfdcvbn,k,gfslsfghjkmlkjhgfdkimpouytrezaqsdqjgnhbvcxvbjhjoluytrezetyuopmjnjgrtgjnmoluytrfujkjhgfd

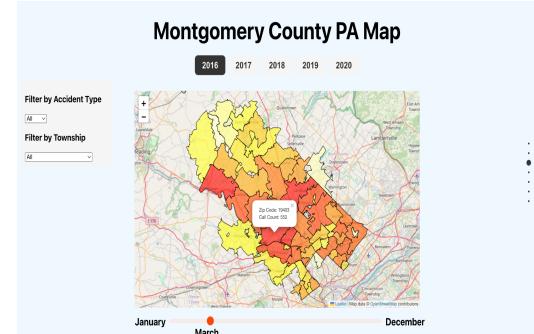
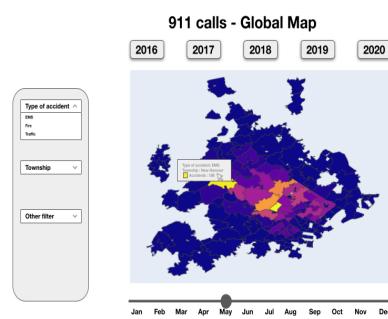
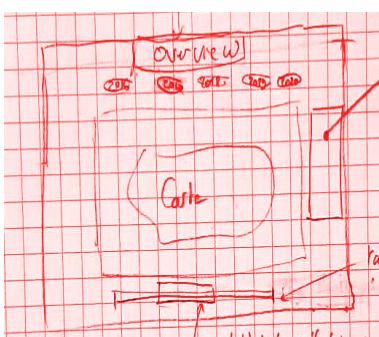
On 29 of April between 2015 and 2020

35 fire emergencies 125 health emergencies 12 traffic emergencies



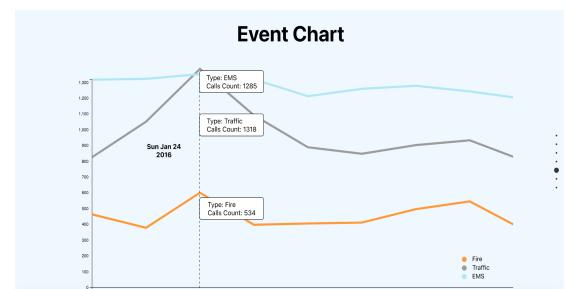
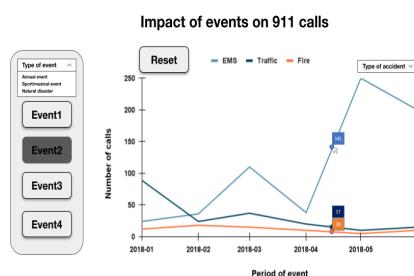
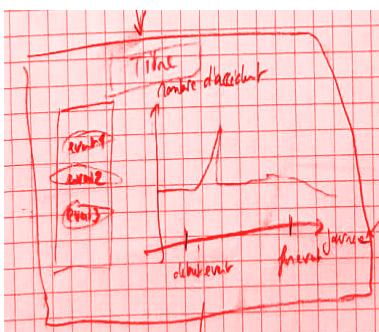
We can see that we stayed pretty consistent with the idea. After changing the background color to make the video pop-up more, we also modified the text's color to white. Additionally, we successfully incorporated a dynamic average call counter that corresponds to the current day, adding more movement to the design.

Montgomery County map slide



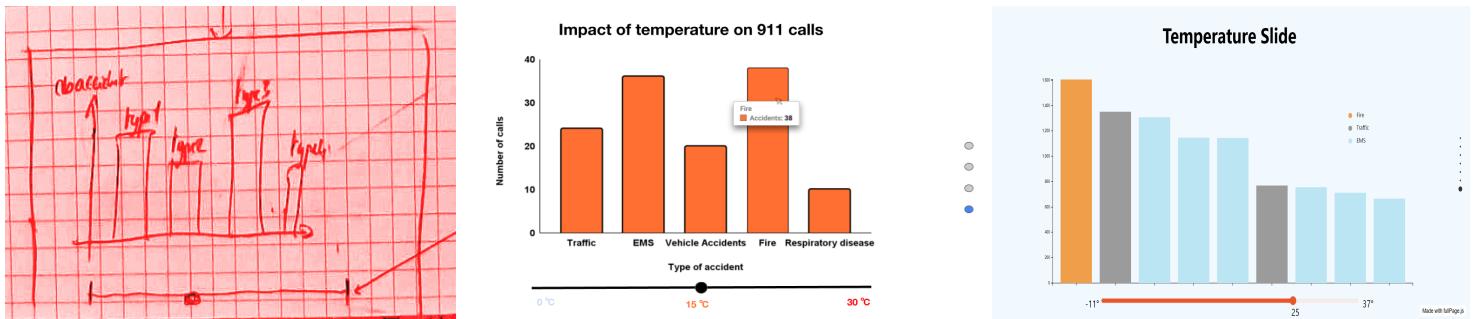
We succeeded in implementing the ideas of our first sketches. The map is more defined from the milestone 2 (image in the middle) to our final website, since we filtered zip codes which had very few calls and restricted them to the ones of Montgomery County, PA.

Event slide



We unfortunately had difficulties creating the event chart as we wanted. It was difficult to correlate big events like superball, etc... to the data trendings, as it seemed that there was not a strong correlation in the data and big public events. We should have done more research before or explored more of the data beforehand.

Temperature slide



For this last visual, we also managed to stick with our initial thoughts. The bar chart and the tooltip with hover work as expected. We decided to improve the visualization and its understanding thanks to colors. We used again the color scheme for each type of event (Fire, EMS and Traffic)

4. Teamwork

Presentation of each team member and their contributions to the website

We worked in a team of three students. Here is a brief introduction of each member and their respective contributions. We attributed each slide to one team member.

Yann Cretton - SV, MA2

Storytelling, Data exploration in milestone 1, Sketch for milestone 2, creator of the Event Slide

Linda Delacombaz - SV, MA2

Storytelling, Exploratory Data Analysis for milestone 1, Sketches and text for milestone 2 , creator of Montgomery County Map Slide, Process book report

Vincent Flattot - IN, MA2

Storytelling, Data scraping for temperature, Text content for milestone 2, creator of the Introduction and Temperature Slide, creator of the core of the website, Management of the github repository