DGM 6108 | Programming Foundations

By Prof. Marc Stober

Relationship between my Screen Time & Hours of Sleep and Productivity

Northeastern University College of Professional Studies

Maters of Professional Studies in Digital Media Connect

Fall 2022 Term Project Report

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Abstract

For this term project I decided to explore how my productivity is influenced by the time I spend on internet, that the more time I spend on internet, my screen time increases, which negatively impacts my productivity. Also, if my screen time increases it directly affects my sleep duration, which is another factor which is linked to my productivity.

This project allows me to analyze and conclude my hypothesis. I have been collecting data for the past 2 months.

The data that I have collected for this project are –

- Date (DD/MM)
- Start Time (24 Hours format)
- End Time (24 Hours format)
- Notification Received
- Screen Time (Hours)
- Data Used Per Day (Gigabytes)
- Hours of Sleep (Hours)
- Productivity (0 to 5)
- Most Used Application

The data that I have used for this visualization are –

- Date (DD/MM)
- Screen Time (Hours)
- Hours of Sleep (Hours)
- Productivity (0 to 5)
- Most Used Application

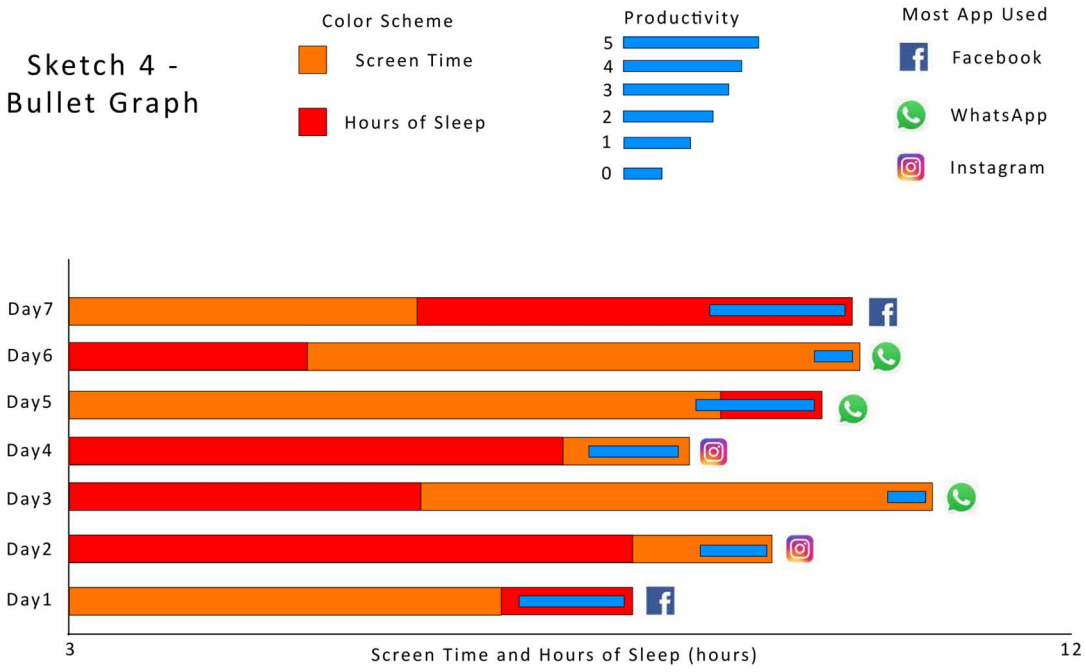
I had collected the Screen Time and Hours of Sleep in hours, but for the visualization I converted it to seconds, which provided more flexibility to plot the data.

Rationale for Final Visualization

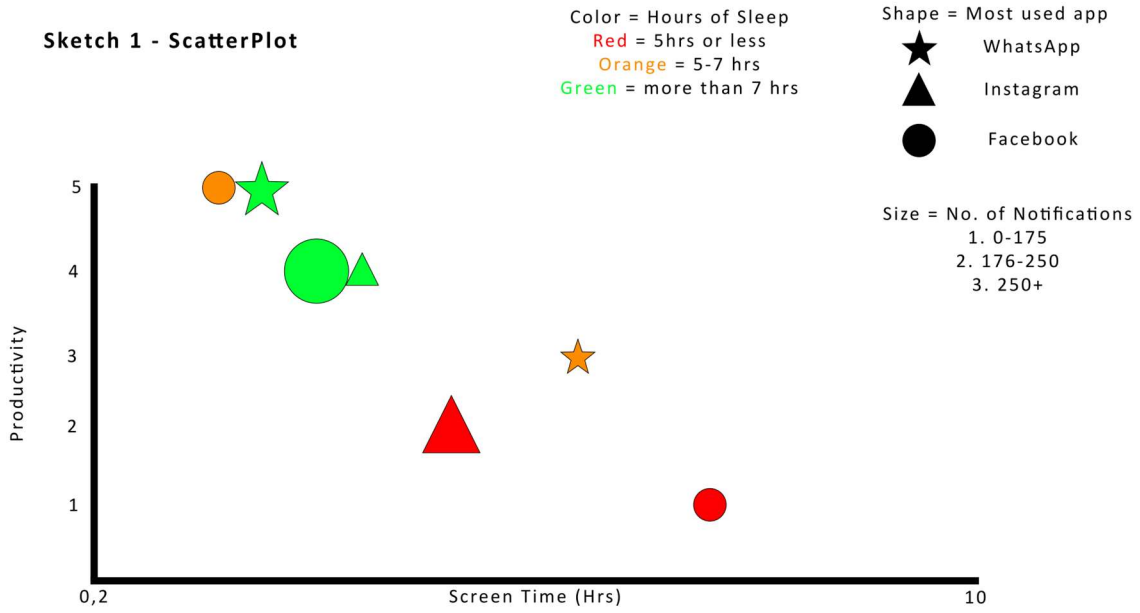
Through this sketch, I aim to achieve a clear and accurate understanding of which factors I need to have control over to help boost my productivity and hours of sleep. Because of the technical nature of this visualization, it is beneficial for me that I can now understand how my screen time disturbs my sleep, which directly affects my productivity.

Through 'bullets' the data remains organized and depictable. The benefit of this chart is that I'm able to correlate various factors as they work together yet keep them separate, which gives a clear understanding of how these factors work throughout the day and how a minute change in one factor could significantly affect the other.

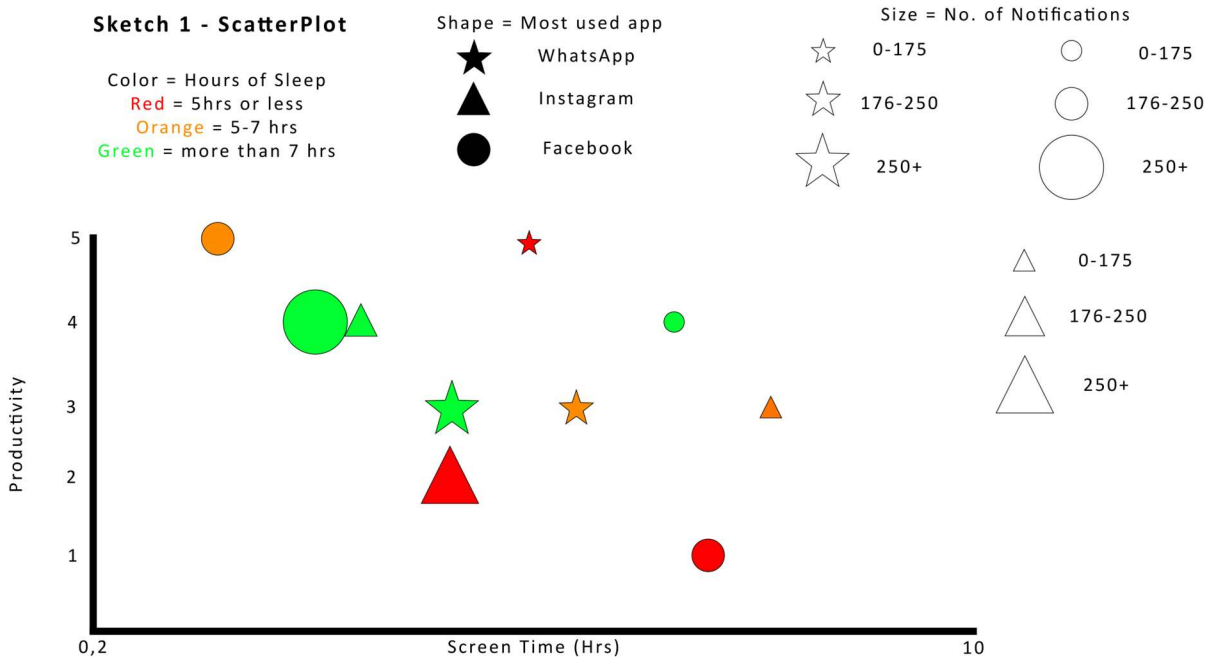
This graph is suitable for my data as each bar will represent two variables with the same unit, that is, screen time and hours of sleep (measured in hours), which will help me to determine the direct correlation between screen time, hours of sleep, and productivity. I have specified a length for each productivity level and used it inside each bar.



Exploring other Visualization Types



Sketch attempt 1



Sketch attempt 2

I made a scatterplot with a twist of different shapes, colors, and sizes for sketch 1 out of my 4 final sketches. It was a great effort and had the following benefits:

Readability: It has good readability; the X and Y axes allow the data to be read effectively. The scatterplot structure allows you to denote the value of every shape effectively.

Code: The code is very similar to a simple scatterplot, except the only change would have been coding different shapes. So, it would be really easy to plot this graph.

I didn't go ahead with this, because it had the following drawbacks:

Simplicity: This chart, being similar to a simple scatterplot, didn't challenge my creativity. In any case, it was advised to think outside the box and try something more complex than a simple scatterplot.

Saturation: The shapes for 40+ days might overlap, which would make the entire graph look saturated, and the circles would hide behind the triangles and starts.

Whereas, sketch 4 which is a bullet chart that I ultimately did choose for the final assignment, is very different from sketch 1 above. Although it had a very readable X and Y axis and accurate positioning for the shapes, it didn't focus on creativity. I also used random colors in that chart and learned that a color gradient is needed to denote numerical data. In my bullet chart, I have used a color gradient to denote my productivity, so that works better. Also, in Sketch 1, the overlapping would have been a big problem, whereas, in the bullet graph, the bullets always stay separate from one another, and this provides great readability and is better to look at.

Analysis

My hypothesis is: As my screen time increases, my productivity decreases. Throughout my attempts, including the final one, I have stuck with this hypothesis statement and have not changed it for the final visualization. My data has been very helpful in understanding my routine, which includes my screen time, productivity, hours of sleep, number of notifications, data usage (GB), and most-used applications throughout the day. I decided to explore the correlation between all of these elements.

I have concluded that my final visualization showcases a fairly good idea of how my screen time heavily affects my productivity. For my final visualization, I decided to use the following elements: screen time, productivity, hours of sleep, and the most used application. Initially, I had included other data like the number of notifications and data used (GB). I decided not to use these two as I did not want to overcrowd my final visualization with excessive data that might not play as much of a role as other bigger datasets in my visualization. Although these two elements are directly proportional to my hypothesis statement, the more notifications I receive and the more data I use, the less productive I am on that particular day.

I would be lying if I said this project has not instilled a big wave of self-realization in me. I have learned so much about my daily routine and how the digital world can change so much within and around us. Until I manually began to track down data, I had no idea that so much of my time goes into surfing the internet. It was also brought to my attention that the number of notifications that I receive per day could affect my productivity to a great extent. My internet usage adds up to my daily screen time, which negatively affects my sleep duration, which in turn affects my productivity. This speaks volumes about the cons of the internet. I have also realized how it can affect one's mental health. With less sleep, I do not feel productive, and this could affect my thought process and ideas. I now have a different perspective on the way I function. Thanks to this project, I am now able to keep track of my daily internet usage, and I would like to continue even after this project until I can make a permanent change in my schedule. I will try to use certain applications like Facebook, WhatsApp, and Instagram, which are killing my productivity. I had turned a blind eye to my internet usage before, but I am more cautious now.

To support my hypothesis statement, an alternative option for data could have been different genres of content that I consume, like video content, music, podcasts, etc. This would also affect my screen time, which would directly affect my productivity. Another set of data that I could collect would be my daily gaming activity. I play games on the internet daily, which also negatively affects my screen time and productivity.

To be honest, I did not collect any form of data about my daily routine before this project. I always had a general idea of how much time I spend on social media applications daily, and how this makes me less productive, which is why I chose this topic for my hypothesis in the first place, to turn this into more factual data.

As I mentioned above, I am surely inspired to collect more data until I can fix my schedule. I want to track my screen time for another couple of months, work on my schedule simultaneously based on the collected data, and track how my productivity would gradually change as I reduced my screen time day by day. I want to make a permanent change in my daily routine, and I cannot think of a better tool than this project to help me do so.

Citation

For Visualization - https://datavizcatalogue.com/methods/bullet_graph.html

For plotting the date and bars on Y-axis - https://github.com/kriscfoster/d3-barchart/blob/master/index.js