Dynamic Web Mapping
Using Code to Automatically Connect Google Excel Spreadsheets to a Google Map Webpage
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I. Introduction / Lit Review

A map does not just plot, it selects and forecasts meanings; it forms images between here and there, and between disparate ideas that we did not know previously connected. This quote from Baquero’s (2013) and Fornari (2008) provides the perfect quote to describe how I view this mapping project. With technology constantly growing and evolving, it is important for people to realize just what they can accomplish with it. Thus, it is useful to use technology in a positive way that can help us see things we have never noticed before, such as Larren’s quote describes. Using the computer code, that Professor Winiski and I found and modified to my map’s needs, we created a relationship that could translate the meaning of a simple latitude and longitude address into a map that can provide a much different, deeper meaning.

According to the authors of Using Collaborative Web-Based Documents to Instantly Collect and Analyze Whole-Class Data, by Herr et al. (2011), “Google Documents is currently the best suite of development tools, and one can be confident that these tools will continue to improve in ways as new tools are introduced by Google and other partners.” Google has a wide array of tools through their Google Drive. This Google drive contains email services, a word processor, a presentation service, spreadsheets, forms, and drawing. Although my research, I have found that Google’s API anyone can manipulate the internet in ways that could benefit them greatly in life, especially with technology constantly growing.

First, in order to prepare myself to begin my project I completed courses online at Codecademy on coding. In particular, I learned about JavaScript and Google Maps programming. This was an extremely important step that was necessary for my project because JavaScript programming is often a requirement if a web page needs to be dynamic, which is what made my Interactive Map work. After my extensive research I found websites and tutorials that were also focused on making a dynamic web page using JavaScript coding. We also used Firebug and a special web development tool for Firefox, Firebug, to test the code on a web-based page. Then I added a section of code that geocodes my addresses automatically in latitude and longitude. Finally, I double-checked my project for any errors in code before I exported the address and latitude and longitude of the cities and states of where my fellow Geographic Information System classmates have lived or visited and entered them into my spreadsheet. After doing this, I refreshed the webpage, these are the current points that you see on the map on the right were mapped, and they correlate directly to the latitude and longitude or address columns on my Excel Spreadsheet.

This project is unlike any other Geographic Information Systems project I have done before because it involves dynamic mapping with computer codes. Or in other words, instead of a fixed map that can only be changed or edited by the user going through multiple steps, my map would be changed by simply adding a code in a latitude and longitude or address onto my Google Spreadsheet. This Google Spreadsheet is attached to my online Google Map through JavaScript code and loops. Therefore, whenever new information is added to my spreadsheet my online map automatically reflects that addition or change, which makes it more user-friendly and convenient than normal static maps.

II. Methodology

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III. Code Academy

Before I created my Dynamic Web Mapping project I did not know much about the APIs and code that I would need to use to accomplish my goal. I went to Codecademy online and completed their courses about JavaScript programming and JavaScript loops. Throughout this program I learned, in a general sense, how to build and manipulate the code that I would need to use for my project. JavaScript is commonly known as an object-orientated computer programming language most often used to create interactive effects within web browsers. In Codecademy I learned how to program with JavaScript through different hands-on lessons and activities. This skill was very important because I had to be able to program or code for my project. Figure 2 is a portion of the code that is connected to a Google Spreadsheet, which is connected to the web Google Map through JavaScript coding. The JavaScript coding allows my map to be automatically updated and changed if I ever make any changes or modifications to the code. This was done by using the JavaScript code that I learned on the website for the key to my mapping project.

IV. Results and Discussion

The most unique part of my mapping project is that I made a dynamic map that used JavaScript coding to make a relationship between the Google Excel Spreadsheet and Google Map Website. Currently, dynamic mapping is not commonly used and if it is used it is not used to its full potential. Dynamic mapping, similar to mapping on the fly, is important because as Baquero (2008) said, “when a GIS is able to capture and correlate geographic data, the user gains an in-depth perspective of the system being studied. Dynamic mapping allows the user to manipulate the map in ways that could benefit them greatly in life, especially with technology constantly growing.”

In conclusion, the process of “mapping-on-the-fly” or dynamic mapping with Google Excel Spreadsheets is possible, and theoretically an easy concept to perform. I performed the type of mapping-on-the-fly coding and loops. Dynamic mapping is at all times a difficult task to accomplish with certain websites APIs or coding. With knowledge and experience with other APIs you could easily change the map into a different format.

V. Conclusion

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VI. Future Research

As far as future research, I would like to do more research on the coding skills that I have acquired through this project in order to use my Codecademy courses. This may not be necessary to do for Furman University Admissions to be able to do, but it may be helpful if you want to do more research in this field. If I were to do more research in this field I would also like to thank Codecademy for their truly innovative idea of making coding easy to understand for everyone. Finally, I would like to thank the Earth and Environmental Science department at Furman University.

VII. Acknowledgements

First and foremost I would like to thank Professor Winiski for always being willing to help and for believing that I could perform this project. Along with my fellow Geographic Information Science classmates who were always ready to listen to my questions and would answer them with the best knowledge that they could. I would also like to thank Codecademy for their truly innovative idea of making coding easy to understand for everyone. Finally, I would like to thank the Earth and Environmental Science department at Furman University.

VIII. References / Data Sources