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GIS Maps for Public Technology

Commercialization Plan

Elevator Pitch: Students and other individuals need access to modern technology without high costs. By creating a map that contains all of the information and locations of areas that have these technologies available for public use, we can eliminate the cost factor behind them and allow for more people to access and use these technologies.

Part 2 Executive Summary:

Using layered data (data that may overlap with other data, such as an area that has more than one type of public technology available) and gps information, GIS (Geographic Information System) maps can be made to allow users to find areas around them with specific modern technologies for public use, such as 3-D printers, computers, etc. Constraints within the map can be utilized by the user to further enhance their search results and limit the number of unrelated results. Programs such as ArcGIS, a GIS map creator, and Google Maps can be referenced and possibly utilized to help create a fully-functioning program. Other programs may include online coding sites to create an interface and to store the location information; this will use Javascript, a type of coding language that is popular in the current day. The format in which this program will be exported to will most likely be as a website-based application, versus a software application that has to be downloaded.

Part 3 Problem Summary and Proposed Solution:

Students need ways to access modern technologies without the high costs because I learned that this is one of the main barriers that are faced by students and schools alike. This problem, however, is not limited to just students and schools. Upon further investigation, it was found that travelers from businesses also need help finding areas that have specific technologies available such as high-speed public-use wifi. Therefore, those who are affected by this problem are those who are unable to afford these technologies for themselves, or those who are unable to travel with these technologies readily available. By creating a map that outlines all of the areas within a certain distance that have public technologies such as wifi and computers available for public use, we can aid mainly in the learning processes of students and help reduce the costs that schools have to endure for these technologies. This would be done using GIS (Geographic Information System) mapping to collect location data and information regarding the public technologies available, and then applying it to a user-friendly interface that is simplistic and sleek.

Plan Part 4: Summarize the STEM Concepts and Principles Underlying the Overall Plan.

A Geographic Information System (GIS) mapping is a system that "analyzes and displays geographically referenced information… It uses data that is attached to a unique location" (USGS, par. 1). GIS mapping is not new but is rapidly making its way into many different fields, such as the "management of resources, crime mapping, establishing and monitoring routes, managing networks, monitoring and managing vehicles, managing properties, locating and targeting customers…"(Mapasyst, par. 2). Javascript coding can be used to create an easily-accessible interface, an interactive map, and organize information that is input into the system into different categories based on the available technologies and location. An easy-to-use and understandable website would allow more people to use and benefit from it, making it more of a success.

Part 5 Commercialization Assessment of the Overall Plan

Problem - Many people are not able to access modern technology to help aid their educational careers because of financial issues, putting them at a severe disadvantage. According to USA Facts, "Overall, 4.4 million households with students still lack consistent access to a computer and 3.7 million lack internet access… 34% (families) reported not having internet because they were unable to afford it" (USAFacts, par. 5, 7). The rising cost of modern technology leads to pupils having to put up with cheap and inefficient technologies, such as the school-issued Google Chromebooks. I have heard that these laptops cost around $200 per, but they run very poorly for their price; many students complain about how they perform, and would much rather bring in their own laptops to work on (if they can). Thus, students that need the proper technology to advance their education are stuck in a sort of limbo between no technologies and modernization, leaving them with lackluster tools to work with.

Proposed Solution - The proposed solution is to create a map of an area (in this case, the map would detail areas centralized around Akron, OH) to help better communicate the public modern technology that is available. Geographic Information System, or GIS, is a system that uses locational data in order to map out specific areas, and can allow for data layering (in this case, data layering could be used to create constraints that the user could use to find areas of their specific interests; for example, the user is looking for an area specifically with 3-D printers). This map would be available for public use and localized within an application and/or website.

The user would simply have to type in the URL of the website and choose their location, or download the application and follow the steps.

Target Customers and Intended Users - The target audience would be those who are currently unable to purchase or acquire modern technology for themselves. This could be due to financial constraints, product availability, or numerous other reasons. For this project, the target audience would be limited to a certain area, specifically those who are within the Akron area. Students would be the largest anticipated audience, with age groups ranging from about 11-26, but the app/website would be open to anyone.

Competitors - Competitors for this product would most likely be any type of website/application that offers a mapping tool (ex. Google Maps). In general, though, their range for their product is broad and used for numerous purposes; this product would focus specifically on finding areas that have technologies available for public usage. And as a bonus, it could be possible to use a product such as Google Maps to this product's advantage, using the pre-existing GPS data to create a simple map that could have additions to it to make it specifically for finding technologies. As far as other GIS maps are concerned, they focus mainly on commercial use; for example, they can be used in mapping customers for a business, or in the engineering field for design plans (Mapasyst, 2019).

Customer Value Proposition & Competitive Advantage - The difference between this product and others is that it is focused specifically on the different public locations that offer public technologies in a targeted area. Many other mapping applications as mentioned previously are focused on just mapping an area and giving a brief description of every location within that space; this product minimizes the time and effort needed to find an area with the exact technologies that someone is looking for. The constraints that this product would offer would minimize the search even more, proving to be a more efficient product in finding technologies that are available.

Principal Revenue Streams Expected - The revenue stream would stem from advertising, specifically through Google Adsense, on the website model of the map. Other advertisements would be available on an application, but they would be kept to a minimum to keep user satisfaction high. Though they make little money, advertisements would be the best option available for this type of product, since it is meant to help the financially insecure and unknowing users. Making users pay for this service would make the product a disservice, making

it rather useless. Through mostly non-invasive advertising, both parties can benefit from the product.

Principal Startup and Operating Costs Expected to be Incurred - There is thought to be little startup costs associated with this product. The only startup cost that could be incurred is a license for a program to code the map on, or potentially any costs associated with Google Adsense. As for the operating costs, a domain would have to be used for the operation of the website, which costs roughly $12 per year it is active. However, these prices can differ depending on a number of factors such as the domain, extensions, etc. (WPBeginner, 2021) The only other cost to be incurred would be the time to create the app/website.

Part 6 Science and Technology Proof of Concept:

Review and Assessment of the Scientific Literature: It has been found that GIS maps have a wide range of applications, including crisis management, construction, modeling, etc. They help to minimize the costs of these processes, and are an effective way to communicate specific parts of a data set based on the user's needs. Since many institutes and companies are creating geospatial data via satellites and other collection methods, Geographic Information Systems are relatively easy to create; however, due to a lack of knowledge, many countries are still unable to use and take advantage of GIS (Osti, 2021)

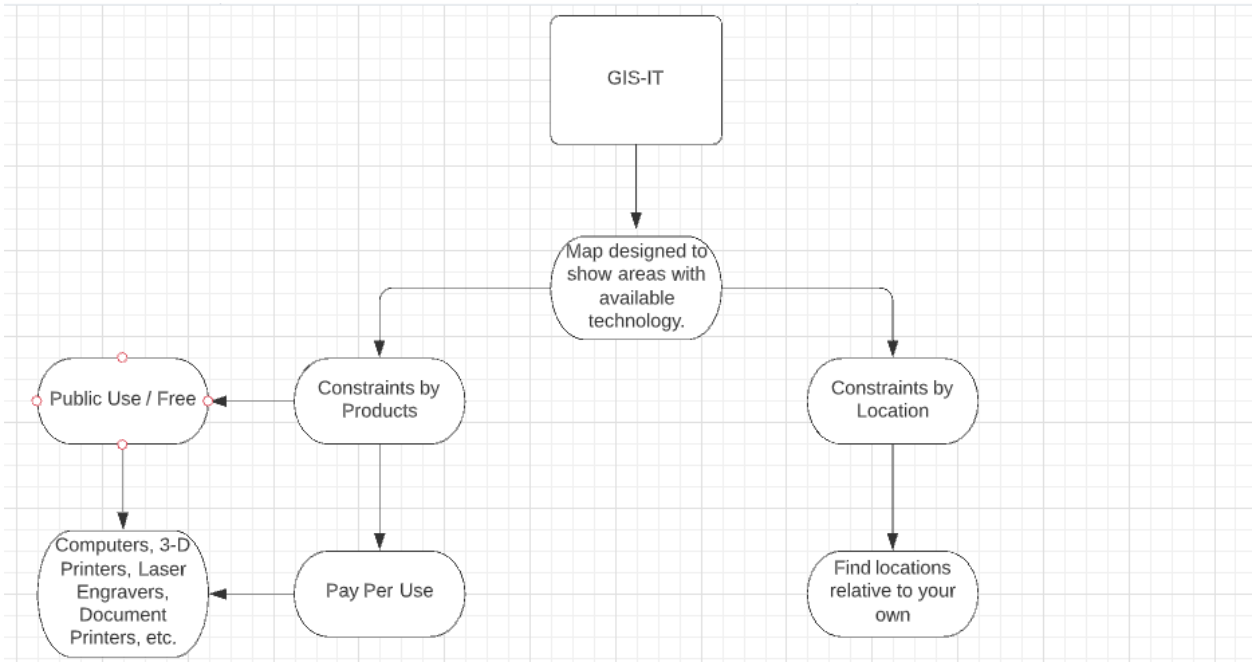
Discussion of Findings with Relevant Cited Sources: I found that a GIS map is one of the best ways to combat this issue of a lack of knowledge about public technologies, since it is easy to use/understand and has been used in the past for a multitude of applications, including construction and crisis management (Osti, 2021). Using a program such as ArcGIS is the best way to create such a map, and will likely produce the best results (ArcGIS, 2021).

Statement of a single, clear and compelling testable hypothesis: People need ways to access affordable, cutting edge technology because I learned that many are unable to access these life-changing resources. If I create a GIS map that is formal, informative, and interactive, then more people will be able to access available technology that will improve their learning processes/lives.

Inquiry or Design-Based Solution: My solution consists of a Geographic Information System displayed in a map format. This is a common and effective way to express the information accumulated within the data system, and will allow for a better representation of the

information to the user. The map will consist of an interface that will introduce the user to the map and how to use it to their full advantage, including options such as the constraints of information that the user can implement to narrow down results. This is where the 5 E's of user experience will come into effect; entice (how the user will initially hear about the product), enter (how the user will find the product after hearing about it), engage (what will make the user continue to use the product), exit (how the user will exit the product), and extend (what prolongs the user into using the product for an extended period of time). Prototyping will begin with an alpha version of the map, containing various information about an area on a much smaller scale, with a few different constraints in order to ensure that they work properly. It will also contain the interactive GUI as mentioned above, but in a much more "early" variant.

Flowchart:



(Wireframing of project, outlining what the project entails and it's constraints/results)

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Part 8: References Cited:

About the Editorial StaffEditorial Staff at WPBeginner is a team of WordPress experts led by Syed Balkhi. Trusted by over 1.3 million readers worldwide. (2021, March 26). *How much does a domain name really cost? (expert answer)*. WPBeginner. Retrieved November 9, 2021, from https://www.wpbeginner.com/beginners-guide/how-much-does-a-domain-name-really-cost-expert-answer/.

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