Worcester Community Connections Coalition Digital Blue Book

An Interactive Qualifying Project
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Abstract

The Worcester Community Connections Coalition (WCCC) assists struggling individuals and families to find critical resources that meet their needs. The WCCC publishes an annual printed family resource guide called the Blue Book. This project developed a digital platform for the Blue Book, allowing it to be more widely available to the community and easily updatable. We conducted stakeholder interviews with social workers and caregivers and developed a mobile-friendly web-based version of the Blue Book. The website features buttons with icons, a scrolling feature, and a separate page for each resource with links, phone numbers, and locations. The Digital Blue Book will allow more Worcester community members access to information when they need it.

Executive Summary

Introduction and Background

In the City of Worcester, one major organization named Youth Opportunities Upheld Inc. (Y.O.U. Inc.) works to support its residents and lower the city's high poverty rate. We found that in America, the poverty rate is 11.8% (Worcester Regional Research Bureau, 2020). However, in Worcester, the poverty rate is significantly higher at 21.1% (Worcester Regional Research Bureau, 2020). This means Worcester has 39,220 residents that struggle to meet their needs (Worcester Regional Research Bureau, 2020). Y.O.U. Inc.'s goal is to provide children and families with opportunities to reach their fullest potentials. Within Y.O.U. Inc., the organization known as the Worcester Community Connections Coalition (WCCC) is dedicated to creating a support system for families to help lower child abuse and mistreatment. The WCCC is a coalition of parents who work to bring a voice to the residents and provide resources for the community that will allow parents to feel confident and supported as they raise a child and start a family. Youth Opportunities Upheld, Inc. (Y.O.U. Inc.) is a private, non-profit child welfare and behavioral health organization and the WCCC works as a part of. Y.O.U Inc.. Y.O.U Inc. is also a part of the Seven Hills Foundation & Affiliates organization. These goals are accomplished in part through the 'Blue Book,' an extensive 180-page support guide given to Worcester parents. The Blue Book contains an encyclopedia of helpful resources and is a staple for many low-income families and social workers. Our project aimed to help reach more people in need of these critical resources through the creation of a digital platform. During this project, the WCCC gave us the information we needed in order to convert the paperback "Blue Book" into an online platform to make it more accessible to the Worcester population.

Methodology

The main goal for this project was to create a digital platform for the WCCC to provide their "Blue Book," allowing it to be more widely available and easily and frequently updated. We created five step-by-step objectives to achieve this goal by the end of our 8-week IQP project timeline:

1. Gain an understanding of what the Worcester community needs in a digital resource guide through research and interviews.

2. Gain an understanding of the WCCC and what it needs from a digital platform and the options it had available, and the limitations of those options.

3. Gain an understanding of other organizations and individuals who have developed similar digital resource guides and learn about the processes they followed.

4. Develop a digital platform that contains all of the necessary resources of the guide that is also easy to use and accessible to those in lower income families.

5. Develop a guide for the WCCC that instructs them on how to update the digital resource guide.

In Phase 1, we focused on researching the Worcester community and interviewing parents, and social workers to better understand what the community needs. Later we began communicating with members of the WCCC and Seven Hills Foundation which allowed us to conduct interviews with our sponsor Anne Bureau, the Program Director at the WCCC, other WCCC workers, and Seven Hills employees to gain an understanding of the WCCC, its impact, and the need for a resource guidebook. We then continued our research by conducting interviews with different individuals who had success in creating digital platforms for other organizations, like Stigma Free Worcester, in order for us to create a successful and useful digital platform. Once this phase was complete, we were ready to begin the development of the digital guide.

In Phase 2, we went through two steps to create the website. The first step was to create a mock-up design of what the digital platform looked like. After presenting the design to the WCCC for feedback and improving the design, we began creating the website. We then distributed the website to users and implemented their feedback to create a more user-friendly website. We later compiled the information on how the digital Blue Book could be maintained and updated into a guide for the WCCC. We presented the guide to the WCCC and received feedback on how it could be improved. Lastly, during our last completion week, we passed the project to Seven Hills for them to make any further changes to the website.

Findings

 When working on this project for the WCCC, we made the decision to organize our findings and research into four main groups. These were recurring themes that we consistently noticed while researching the community, interviewing community members, and receiving feedback from Worcester parents and our sponsor about the usability and functionality of our website. These themes included user experience findings, technical findings, design-related findings, and sustainability related findings.

 Our **user experience findings** included learning about the level of technical expertise users had with technology and using that feedback as we developed our website. The social workers and caregivers we interviewed had a basic level of technical experience, so it was important that we designed the website to be as easy as possible to navigate. In addition, the website is often used in crisis situations making easy navigation even more important. We were informed that including icons with the words would be beneficial since it would help Blue Book users in a crisis situation find the resources they need with ease. The images used to represent these icons needed to be vetted by a council to ensure that these images were not triggering those in crisis situations.

 Our **technical findings** were collected through interviews with individuals who were experienced in app and website development. We determined the best approach for a digital version of the Blue Book involved a mobile-friendly website. A number of factors went into this decision, including the technical capabilities of WCCC staff, the programming capabilities of our project team, the timeframe of the project, and features that should be included or excluded from the website. Additionally, we determined that getting approval from both Apple's App Store and the Google Play Store was not feasible, since they generally do not approve apps that can essentially emulate existing websites without extra features. The former WPI project team named Stigma Free Worcester was able to get around this due to their use of location services. However, this type of feature would not have been feasible for us in the given time frame. We concluded that the best approach to our website was to make it as easy as possible to use. We decided to place all of the information from the Blue Book into a CSV file that would display the vast array of information onto our website.

 Design-related findings included WCCC and Seven Hills branding along with the placement of these organizations' logos. The WCCC is an affiliate of Seven Hills and any

additional web pages developed needed to conform to the parent company branding. However, because of the WCCC's strong connection to the Blue Book, it was also important to include WCCC branding as much as possible. We were able to find a suitable balance by formatting the placement and layout of brands to represent both the Seven Hills organization and the WCCC. Seven Hills is currently redesigning their website so we were not able to put our finished product onto their website.

Figure 1: Home Page of the website with WCCC Branding

In order to ensure the **sustainability** of the new digital Blue Book website, we developed an easy to use "How To" user guide for the WCCC and Seven Hills. In order for our sponsor and Seven Hills to update the website independently, we determined that our user guide must explain, step-by-step, every part of the updating process to ensure frequent and easy updates to the website. In addition, we are packaging the website we developed so that it can be built on by the next team and deployed once Seven Hills completed their website redesign.

<div align="center">Results</div>

Our main deliverable for this project was to create an easy to use and fully functional website that displayed information from the WCCC's Blue Book on an online digital platform. The feedback we received from our users was quite positive after they tested our website. From

their feedback, we implemented interactable buttons and this made the website much more user-friendly. After modifying and improving the website, our finished product resulted in a functional and navigable webpage that successfully provided the resources in the Blue Book to online users. The Blue Book webpage guide is also easily updatable for any further alterations that may need to be applied to the site.

Discussing technical additions to the website, we developed a way for the information on the web page to update in an easy fashion for our sponsor. The website updates through the use of a CSV (comma-separated values) file. This allows our sponsor free access to update the information on the website through a spreadsheet software such as Microsoft Excel. By using this Excel spreadsheet to hold information, we developed a way to easily keep the Blue Book website updated whenever any new information needs to be added from the original hardcopy Blue Book. The information can be easily transferred from the physical Blue Book to the online website for all users of the Blue Book to access at any time by entering the new data on its corresponding CSV.

	A	B	C	D	E	F	G	H	I	J
1	Category	Page in Book	Name of Resource	Address	Phone Number	Extension	Website	Person of Contact	Email	Details
2	Employm￼	50	MassHire Central -	340 Main S	508-799-1600; !x 688 (Yout	https://m	John Trainor		*Offices
3	Employm￼	51	Department of Trar	50 Southw￼	508-767-3100; 508-767-3106 (Kenda	Kendall Molina or .	Kenda	*For TAF
4	Employm￼	51	Ascentria Care Allia	11 Shattuc	774-243-3100; 774-242-1773 (Industry sector job readiness¦ E	*Employ
5	Employm￼	51	American Red Cros	2000 Centt	508-595-3700		www.redcross.org/take-a-class		*Nurse /

Figure 2: The figure above is an example of the CSV and how it was used to input the information from the Blue Book to be exported and used in the website.

We also designed the website so that it included features that would allow for better navigation and easier usability for all types of Blue Book users. One of these incorporated features was the use of scrolling to give the user a sense of familiarity in the way they navigate our website since other popular social media platforms have a scroll feature. An advantage of using the scrolling feature to navigate is that more buttons are able to be displayed at a time, and users can locate these buttons quicker than page turning. We also designed the site according to the style guidelines of the parent company, Seven Hills. After accomplishing this we created an easy to understand "How To" user guide manual for updating the website so that our sponsor can make any changes needed in the future.
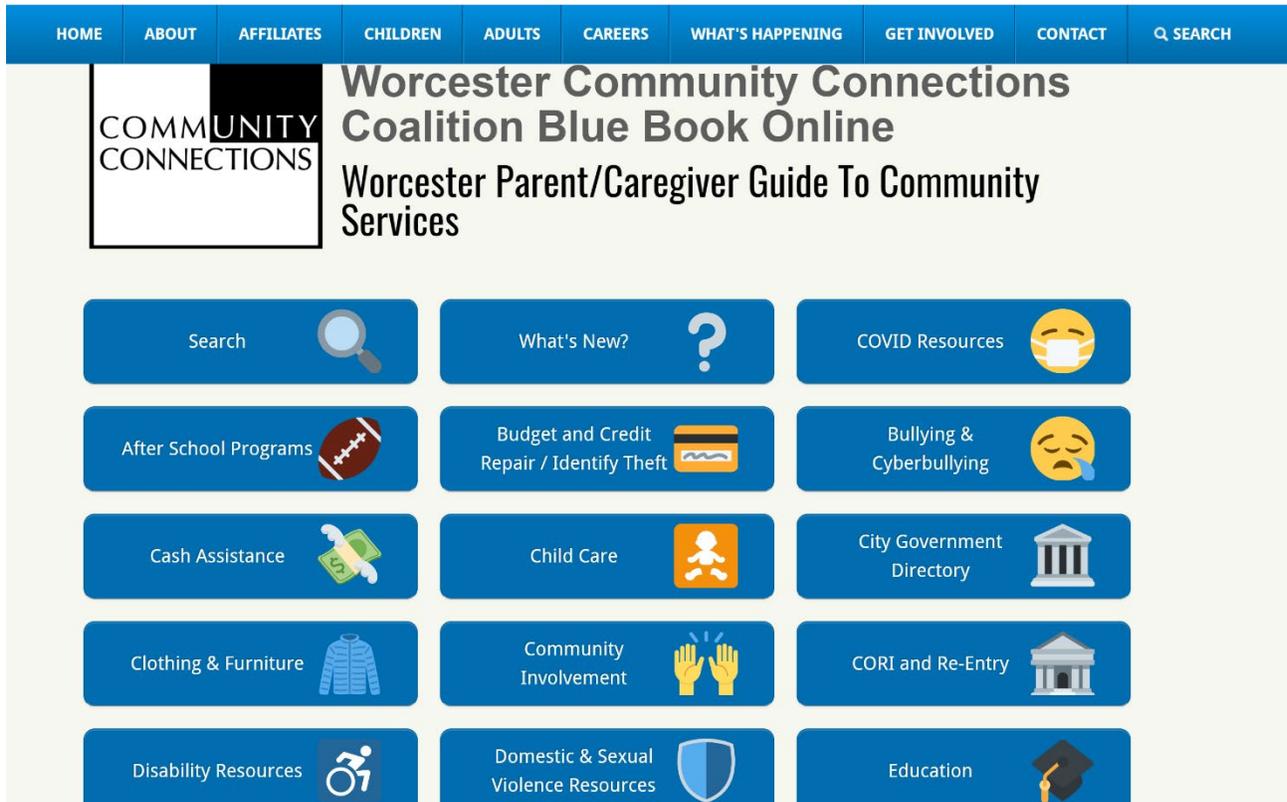
Figure 3: This was our final website design after all of the feedback and revisions. When integrated into the Seven Hills site it will look different but the base design will be the same.

Recommendations and Conclusions

After the completion of our project, we offered our sponsor some recommendations regarding the technical management of the website along with the marketing of the website to make users aware.

At the end of our project, we successfully achieved our main goal of creating a functional and user-friendly digital platform version of the Blue Book while meeting all of the necessary requirements of our sponsor. Ultimately, we will be passing on the website we completed to Seven Hills. Another WPI project team will expand on it by incorporating more features and additions that will make it even easier for users to navigate this website. We also recommended that the new WPI team could create a user interface to help Seven Hills and our sponsor edit the Blue Book information on the website with more ease. The user interface would allow our sponsor to easily make changes to the CSV file used to update the online Blue Book

website. We also recommended finding a way to make the website cache accessible offline to provide the Blue Book to members of the community who do not have easy access to the internet. As an extra part of the website, we recommended adding in technical features like page turning to accommodate the users who originally recommended these features. We also recommended making a new JavaScript or Python script to update all necessary CSV files by sorting new resources that are put into one single file, instead of manually inputting new information on the spreadsheet.

In order to market the Blue Book and let community members know about the finished website, we suggest creating a QR code that when scanned takes the user to the Blue Book website homepage directly. This QR code can be included in the printed editions of the Blue Book so that users can access the website version of the Blue Book if they also have the hardcopy version.

Due to the online nature of the Blue Book, it will be more widely accessible for members of the Worcester community to use. We hope this will allow for more exposure and usage of the Blue Book allowing individuals in need to receive the help they deserve. We also hope that the website will help the WCCC in their mission to aid the community while at the same time help Worcester community members receive the resources they need in order to help themselves and their families maintain a happy and healthy life.

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Introduction

A fundamental theory in psychology proposed by the American psychologist Abraham Maslow in his seminal paper "A Theory of Human Motivation" (1943) discusses the concept of a classification pyramid that shows the needs of humans at its base and develops more complex and emotional needs above that. Across the country, people struggle with meeting the base level of human needs which include air, water, food, shelter, sleep, clothing, and reproduction. We will present and analyze a holistic view of people in poverty, as we move through our research, to understand why their needs are not being met and what can be changed to meet these needs in the future.

In the United States, poverty is measured by comparing an individual's or a family's income to the minimum amount of income required to afford basic needs. Anyone who falls under this threshold is considered in poverty. In America, the poverty rate is 11.8%; however, in Worcester, MA, the poverty rate is significantly higher at 21.1% (Worcester Regional Research Bureau, 2020). This means Worcester has 39,220 residents that struggle to meet the needs in the base layer of Maslow's pyramid (Worcester Regional Research Bureau, 2020).

In the City of Worcester, one major organization that works to support its residents and lower the city's high poverty rate is Youth Opportunities Upheld, Inc. (Y.O.U. Inc.), whose goal is to provide children and families with the opportunities to reach their goals and fullest potentials. Within Y.O.U. Inc., there is an organization known as the Worcester Community Connections Coalition (WCCC) whose goal is to create a support system for families to help lower child abuse and mistreatment. This organization is a coalition of parents who work to bring a voice to the residents and provide resources for the community that will allow parents to feel confident and supported as they raise a child and start a family. These goals are accomplished in part through the 'Blue Book', which is an extensive 180-page paperback support guide given to Worcester parents.

In this project we worked with the Worcester Community Connections Coalition to convert the paperback "Blue Book" into a digital version to make it more accessible to the general Worcester population. Our goal for this project was to create an online platform for the Worcester Community Connections Coalition, allowing it to be more widely available and easily and frequently updated.

Following this section, more background is presented on Worcester, the Worcester Community Connections Coalition, economic issues, social issues, and online resource design. The methodology section provides a step-by-step plan for how we created the online Blue Book. These methods include collaborating with our sponsor, understanding the needs of Worcester residents, evaluating other successful online guidebooks, and then developing the online platform that can be easily maintained. In the Findings section we explain the feedback we received from Worcester parents and our sponsor about the usability and functionality of our website. We also discuss themes we found in our research regarding user experience, technical, design-related, and sustainability related findings. The Recommendations and Conclusions section describes our technical and marketing recommendations to our sponsor and the WCCC about what implementations could be added to the website after its development for our project.

Background

Maslow's Hierarchy of Needs

Maslow's Hierarchy of Needs is a theory developed by Abraham Maslow (1943) in his paper, "A Theory of Human Motivation." This theory states that there are four main needs a person must have met before they can be their best possible self, which he calls self-actualization. The first is a person's physiological needs; this encompasses everything that is needed to keep a person physically alive, such as food and shelter. The second stage is safety needs; this stage describes what a person needs to stay alive once their physiological needs are met, which include health care, education, and a safe home environment. The third stage is love needs; this stage is defined by the human need for love, affection, and belongingness. For adolescence, this usually comes in the form of the family, parents, guardians, and friends. The fourth stage is esteem needs; this stage revolves around the inner self, where an individual needs to feel comfortable and confident in themself. The fifth and final stage is self-actualization; this is the stage achieved when all other four are satisfied, and when an individual can fully express themself. As Maslow himself puts it:

> "The need for self-actualization. — Even if all these needs are satisfied, we may still often (if not always) expect that a new discontent and restlessness will soon develop, unless the individual is doing what he is fitted for. A musician must make music, an artist must paint, a poet must write, if he is to be ultimately happy. What a man can be, he must be. This need we may call self-actualization" (Maslow, 1943).

For our research, we focused on the first three stages of the pyramid (i.e., physiological needs, safety needs, and love needs), and how an online "Blue Book" could help assist those who have struggled to meet these needs.

Physiological Needs

The first stage of Maslow's Hierarchy of Needs is physiological needs. Physiological needs describe what an individual physically needs to stay alive and survive. These are very basic necessities like food, water, and shelter. In the upcoming sections, we looked at homelessness, employment, and food insecurity, to understand how these various factors affected an individual's access to shelter and food.

We began looking at the first stage, physiological needs, and what aspects of it were unable to be fulfilled by some residents of Worcester. One issue that may prevent someone from achieving the first stage is homelessness. According to the Worcester Almanac, a total of 1,593 people in the city of Worcester are homeless, with over 35% of them being under the age of 18 (Worcester Regional Research Bureau, 2020, 46). Housing insecurity was another aspect that threatened low-income families with homelessness. According to the U.S. Department of Housing and Urban Development website, they described housing insecurity as a term that encompasses issues with housing, "including affordability, safety, quality, insecurity, and loss of housing" (Measuring Housing Insecurity in the American Housing Survey, n.d.). Separate data from the Worcester Public Schools reported that there were 2,412 homeless Worcester students, and out of which 1,890 were living in a home with another family (McNamara, 2019). These issues can have a large effect on one's well-being, as they lie in the first stage of needs. Access to schools and education also compounds itself with the issue of homelessness. Families that did not have "permanent housing" would move into new cities due to their need for shelter or new opportunities, which can negatively impact a student's education since they repeatedly switched to new schools (In school and homeless: Worcester's growing problem, 2016). Further household data revealed that "nearly 10 percent" of individuals and families who chose to rent struggled to pay their rent in part or full (Measuring Housing Insecurity in the American Housing Survey, n.d.). If a student did not have a safe and stable home, it had adverse effects on their education, which is discussed later in the second stage (In school and homeless: Worcester's growing problem, 2016).

Employment

In the City of Worcester, unemployment is one of the many factors that can contribute to the lack of a person's physiological needs. The amount of unemployed in Worcester reached a high of 56,226 individuals during June 2020, and this increase resulted from the COVID-19 pandemic (Worcester Massachusetts metropolitan unemployment rate and total unemployed, n.d.). Unemployment in Worcester has a negative effect on obtaining crucial necessities, such as home and food resources. This struggle was analyzed, from a study conducted by Blanchflower about joblessness and the economy, to determine that not being able to find a job when there is a

need for employment negatively impacts an individual's overall happiness and health (Blanchflower, 2019, 21). Blanchflower's study also explained how hard it is for a young individual to find employment after being jobless for so long, which prevents them from obtaining opportunities in the workforce (Blanchflower, 2019, 39). Analyzing all of this information together concluded that unemployment takes a negative toll on a person's wellness and creates deep feelings of unhappiness and stagnancy from the lack of opportunities and income.

Facing hardships in unemployment directly correlates to the idea of income inequality and its ability to make earning an income more difficult. Income inequality also contributes to a person's overall unhappiness when struggling with unemployment. A study conducted about income inequality explains how Americans trusted each other less in years where there was greater income inequality, which also caused an increase in unhappiness in these same people (Oishi et al., 2011, 1097). This explains why families often feel burdened and stuck when facing hardships in earning an income.

Income inequality also directly correlates to how the unemployed, who try to pursue jobs to earn an income, often feel a huge amount of disappointment, discouragement, and unhappiness. All of these aspects, combined with the need to support a family, greatly lower the wellness of an individual as well as the people around that individual (Blanchflower, 2019, 23).

Greater income equality in the United States has been proven to increase levels of overall happiness within the country (Oishi et al., 2011, 1097). With this increase in happiness, it results in the ability for successful children to attract and seek out opportunities when looking to be employed in the future. All of this will allow a child from a low-income family to create their own success, with the help of resources and proper investment in their education. This shows the dire need for access to local Worcester community resources to help low-income families and their children achieve success. Having access to these resources can help contribute to the long-term success of a low-income child's future.

<u>Food Insecurity</u>

Another important necessity is food. The term food insecurity is simply defined as "lack of available financial resources for food at the household level" (What Is Food Insecurity in America?, n.d.). Both the access and quality of food are vitally crucial. If someone cannot have

access to the right types of foods, it negatively impacts their health. In a Telegram article discussing Worcester schools providing free meals to students during the COVID-19 shutdown, they discussed how Worcester used a meal plan program that distributed breakfast and lunch meals to "roughly 25,000 students in the system who wanted them" (O'Connell, 2020). A common struggle could still be seen among students who do not have access to these free meal plans. With regard to a younger age group, the Worcester Magazine (2016) wrote, "'We still notice on Mondays, kids eat more, and on Fridays they save food so that they can have it over the weekend,' Binienda said. 'You have to be really observant of the students you have in front of you. Kids don't want to say, 'I'm homeless, I don't have food.' You have to look for other signs and have that communication be open'" (In school and homeless: Worcester's growing problem, 2016).

<div align="center">Healthy Food</div>

A specific issue that low-income families face in relation to food is the access and ability to afford healthy food. In previous research, it was found that in 2015, Massachusetts was among the lowest of states in the country when it came to supermarkets per capita, causing an uneven distribution of supermarkets across the state (Olendzki et al., 2015). In a research article discussing access to healthy and unhealthy foods in Massachusetts, Olendzki et al. (2015) considers this issue to be one of the most influential factors on a community in relation to their eating behaviors and chronic disease rates. Lastly, the 2005-2010 research study by Olendzki et al. (2015) shows a 4% increase in obesity in Massachusetts while the number of fruits and vegetables consumed decreased from 28.6% to 26.2% in 2009 alone. The low-income families of Massachusetts and Worcester are negatively impacted in relation to their diets due to the lack of healthy food at their disposal. However, some encouraging signs from this research article show that for the most part, the suburban and low-income urban regions of Worcester had access to enough healthy food, although the selection was limited compared to higher-income areas (Olendzki et al., 2015). Although this is inspiring information, the recent state of the economy and livelihood due to the COVID-19 pandemic may have affected these low-income families in Worcester and their ability to afford healthy food at grocery stores.

Safety Needs

The second stage of Maslow's Hierarchy of Needs is about safety needs. Safety needs consist of what an individual needs to maintain their survival once their physiological needs are met. It includes healthcare, a safe home environment, and access to education.

Medical Care

Once someone is able to fulfill their physiological needs to stay alive, they need access to places and supplies that allow them to stay in a healthy and secure state of being. An important part of society's infrastructure that helps fulfill this need is medical care; however, access to this care is also an issue in Worcester. The Worcester Almanac states that there are 5,486 uninsured residents in Worcester (Worcester Regional Research Bureau, 2020, 53). When analyzing the number of people who have health insurance in Worcester County, the percent of individuals without health insurance for all income levels was 4.30% in 2014 according to Percent without Health Insurance Data for Worcester County, MA and Middlesex County, MA. The latter also described that all races in Worcester County had the same consistent percent of 4.30% uninsured according to race. This article also discussed that Worcester County individuals who are at or below 200% of the poverty rate have a rate of 8.60% uninsured (Percent without Health Insurance Data for Worcester County, MA and Middlesex County, MA, n.d.).

Schools

Regarding education, low-income families struggle the most when it comes to obtaining resources that benefit their children. Investment in a child's education is a crucial step that contributes to their overall success in the future. Without this investment, combined with the lack of resources that would help expand a student's knowledge, a child would be prevented from obtaining more opportunities in order to create their own successful life. Success in school presents a child with the opportunity to establish their own safety and security in life. Low-income students face many challenges during their education since they have fewer resources to support them and they often attend schools that have a majority of failing students, which is especially concerning when it comes to passing exams to graduate (Papay et al., 2015, 31S). From this analysis, and due to the excessive number of students that fail in school, there is tremendous pressure on low-income students to successfully pass exams that are required for

them to graduate. An article written by Mercado (2019) discussed the Worcester School District MCAS, and the author explained that the 2019 "next generation" MCAS scores had much higher expectations of students than the previous years before. In English Language Arts for 3rd, 8th, and 10th grade, Mercado (2019) found that 20% of students did not meet expectations while 37% of students met or exceeded expectations. In Math for 3rd, 8th, and 10th grade, Mercado (2019) stated that 23% of students did not meet expectations while 31% met or exceeded expectations. Finally, in Science for 5th, 8th, and 10th grade, 25% of students did not meet expectations, while 27% met or exceeded expectations (Mercado, 2019).

Without the resources that students with more income are able to receive, low-income students unfairly tend to earn lower exam scores, which in turn causes them to fail their graduation exams (Papay et al., 2015, 31S). This leads to a trend of a student struggling to keep up with schoolwork and education. This excessive work can become overwhelming and overbearing for many students, which also contributes to their lack of interest in learning. All family members in a low-income family face hardship, struggles, and unhappiness - especially the children within these families.

To achieve a successful upbringing of a child within a low-income family, it is crucial for all children to have an abundance of support and guidance around them. It is especially important for low-income children to get the proper investment in education they need to be on equal footing with other students from families with different types of income. A study conducted about income inequality in education described that more education actually improves a student's "quality of life", increasing their happiness and health (Papay et al., 2015, 30S). Not only will investment in education result in the improvement of a child's overall wellness, but it will also reflect positively on their ability to enter the workforce.

<u>Love Needs</u>

A person needs to feel emotionally secure and know that they have a place of belonging. This is Maslow's third stage of belongingness and love needs. This stage, called love needs, is about how an individual needs to receive love, appreciation, and belongingness from the people around them. This includes their friends, family, parents, and guardians.

<center>Violence and Bullying</center>

The safety of a person, especially a child's safety, is extremely important in that person's ability to live, grow, and develop into an adult. As children grow, their independence from their parents grows as well. When a child's independence grows, the parent's and families' ability to provide protection and safety, required for children to prosper and advance in life, begins to decrease, despite their best efforts and intentions. However, some children, specifically in lower-income families, are exposed to violence and bullying.

A significant issue plaguing children's safety and well-being of families across the world, having a negative impact on everyone involved, is bullying. The act of being bullied or bullying involves verbal or physical aggression to a person or group of people who are in a position with less power (Wolke et al., 2013). There are always two sides to bullying, the bully and the victim (excluding bystanders), and in almost every case there is a negative impact for everyone involved. For the bullied victims, common characteristics include being weaker than the bully either mentally or physically, poor social skills or social awareness, and lastly fewer friends or peer support (Wolke et al., 2013). The research in Wolke et al. (2013) goes on exploring the impacts of being bullied, determining that there was a decrease in academic and job performance while an increase in mental, physical, and even psychosomatic health problems. The impacts of bullying on children are so negative, that they have been proven to cause complications in adulthood for some victims. Some of these negative impacts on adults include smoking regularly and an increased chance of having a serious illness while also a decrease in the ability to recover (Wolke et al., 2013).

While the negative impacts of being the victim outweigh the negative impacts of being the bully in most cases, bullies are still affected. Bullies, or the aggressors in most cases, are good socially with the ability to manipulate their peers or the victim who they are bullying. Furthermore, they are usually seen with more friends or accomplices and are stronger both physically and mentally. The cause of someone wanting to bully another person is different for every situation, but the most common reasons are due to built-up anger from their home life, the need to make others feel weak due to their own insecurities, and lastly, the bully being bullied themselves (Wolke et al., 2013). Although the effects of being the bully do not have as much impact on adulthood, there are a few general tendencies that occur for former bullies. These include an increase in violence, abuse of alcohol, drugs, and abuse in relationships (Wolke et al.,

2013). Overall, the increase of bullying across the country is a problem every child and family member should be prepared to deal with.

<div align="center">LGBTQ</div>

One aspect of a person that may influence how much emotional support they get, especially from their family, is if they are part of the LGBTQ community. If someone is part of the LGBTQ community, they are less likely to get the love and support from those close to them in order to achieve this stage. This typically also coincides with the below layers of the pyramid, as LGBTQ are more likely to be homeless than their non-LGBTQ peers. When it came to our project, "44% of Worcester's LGBTQ youth reported homelessness, compared to 41.5% of the non-LGBTQ population. Worcester's LGBTQ youth are also more likely to report experiencing homelessness than the state average of 36% of LGBTQ youth" (Kellman, 2018, 14). In addition, "Worcester's unaccompanied LGBTQ youth are more likely to experience homelessness because of abuse or neglect, parental alcohol and/or drug usage, fighting with their parent or guardian, their parent or guardian dying, feeling unsafe or experiencing violence in their homes, their family losing housing, and being told to leave than their non-LGBTQ peers" (Kellman, 2018, 17).

Maslow's Hierarchy of Needs can be affected by a variety of different factors that we discussed previously. Factors like homelessness, education, access to food and medical care, and achieving a sense of belonging are all crucial in order to maintain an individual's happiness and health in life. It can be difficult for so many individuals to achieve these goals if they are struggling. We realized that many Worcester families and individuals struggled to reach happiness and health. This is why the Worcester Community Connections Coalition created a community resource, called the Blue Book, to help Worcester families in need locate places and people that could help them overcome challenges, obstacles, and hardships in their lives.

<div align="center">Worcester's Resource Guide</div>

The Worcester Community Connections Coalition (WCCC) is a coalition of Worcester parents who come together to help families deal with child maltreatment, neglect, and abuse. They work together to help support the success of families and children who are struggling by distributing the Blue Book to these families in need. Youth Opportunities Upheld, Inc. (Y.O.U.

Inc.) is a private, non-profit child welfare and behavioral health organization and WCCC is a part of Y.O.U Inc.. Y.O.U Inc. is also a part of the Seven Hills Foundation & Affiliates organization.

The WCCC has a physical paper guide to help underserved Worcester families find the resources they need to raise their children in a healthy and safe environment. The Blue Book is a resource guide that includes different centers, locations, and areas where Worcester families and individuals can receive help with any issues with which they are struggling. For example, there are locations in Worcester listed in the Blue Book related to recovery centers that can help Worcester individuals recover from substance abuse.

With the rise of technology, the organization wanted to digitize the Blue Book in order to make it more accessible and be able to update it more frequently. Many low-income and homeless families, who the Blue Book primarily targets, use their cell phones to help them navigate the resources they need to get through day-to-day life (Smith, 2018). The Blue Book contains an encyclopedia of these resources and is a staple for many low-income families and social workers. Our project aimed to create a digital guide to help reach more people in need of these critical resources.

Many social media applications today are geared towards higher-earning individuals and families (Sassen, S., 2016). According to Sassen (2016), most applications cater to the high-end worker assumption that when you leave the office and go home, you cannot leave everything at the office behind unattended. However, for low-income workers, the bigger issue is that when they go to work, they cannot close the door behind them and leave their children and families at home unattended. This created a need for applications that connect low-income communities in times of hardship, according to Sassen (2016). Effective applications for low-income communities connect and unite members of the community and provide much-needed resources, (Sassen, S., 2016) which our project aimed to do through the creation of the digital Blue Book. We created a mobile-friendly webpage that replicates the functionality of the Blue Book, allowing it to serve as a digital alternative for its user base.

<u>Digital Guides</u>

There are several apps and mobile-friendly websites that cities and organizations have created in order to help their communities and connect people to the resources they need. In this section, we give an overview of several applications and websites that had similar end-goals to

that of the platform we made. First, we will discuss the Bridge Over Troubled Waters Street Survival Guide app, which is an app designed to help homeless and struggling youth in Boston. Then, we review the GetHelpNow Montgomery County app, a similar app that is geared toward helping the citizens of Montgomery County find mental health and drug and alcohol abuse resources when they need them. Finally, we looked at the Framingham Community Connections Coalition's website and detailed some of the design features that we could have included in our website design. All of these resources were an excellent launching point for the design of the digital Blue Book.

Bridge Over Troubled Waters, an organization dedicated to helping homeless youth in Boston, created a Street Survival Guide app (also called Bridge Over Troubled Waters (2018)). The goal of the app is to help homeless youth in Boston find resources such as food, shelter, domestic violence support, sexual assault support, and even support for those suffering from drug and alcohol addiction (Bridge Over Troubled Waters, n.d.). Similar to our sponsor, Bridge Over Troubled Waters had previously been using a paper version of the guide to help homeless youth. However, due to the rise of smartphones as a major tool for the homeless population, Bridge wanted to update their system and add live features (Smith, 2018). The PDF of the paper version is a large collection of the resources in crowded text form, which can be difficult for its users to understand and locate the information that they are searching for. A web page discussing how to create a resource guide revealed that it is much easier for the users of a resource guide to find recommendations by separating topics into categories (McQuaid, 2017). While the paper guide was organized by section, it appeared a bit overwhelming. In addition, as is the case with most paper documents, it was impossible to update circulating copies. Therefore, newly updated copies had to be printed once a year in order to share new resources with the public. The app version, however, was well-formatted and straightforward. The home page had their address and hours, buttons that linked to a few of their most popular resources, and buttons for calling and messaging the organization. The drop-down menu on the top left corner provided a more comprehensive list of the categories of services they provide, and each linked to a list of resources. The categories were very similar to those on the PDF version, allowing those who knew the physical version to also be semi-familiar with the digital version. The resources each had a short description, and usually a link to a website, a phone number, and/or a location. Even though we were designing a mobile-friendly website instead of an app, this app was very similar

to what we wanted to create; It was simple to use, well organized, and provided a lot of information on helpful services without being too overwhelming.

The GetHelpNow Montgomery County app works similarly to the Street Survival Guide, but its purpose was to help those struggling with mental health and drug and alcohol abuse. Its setup was somewhat inverted to that of the Bridge app. The home page contained the categories of resources the app provided, and the drop-down menu on the side contained About, Feedback, and Share tabs (Ascend Innovations, 2020). Their website was almost identical to the app. The overall layout of the app was also fairly user friendly and had more functionality on the home screen and seemed like it could be more convenient. The best way to make an app user friendly is to have as few obstacles as possible between the homepage of the app and the information the user needs (Pervaiz, 2020). However, from self-observation, putting too much on the home screen can also be confusing and overwhelming for a user. We think we found a balance between the Bridge app and the GetHelpNow app that allows ease of use and an intuitive setup.

Framingham Community Connections Coalition (FCCC), another family-based organization in Framingham, maintained their own website for their coalition. While this is different from the type of website we made because it centers around the organization instead of one of their resources, it still had some good design elements and information for us to consider in the design of our website. The most important thing to consider when designing a web page or app is the information that you want to convey to the user (Pervaiz, 2020). While the style of this website was quite effective for conveying the information it needed to, the information our website needed to convey warranted a much simpler and more accessible setup. The closest parallel to the website for the Blue Book was the "Youth Opportunities" page of the FCCC website (Youth Opportunities, 2018). This page had several categories of opportunities that the Coalition had connections to for youth in need. Due to the nature of the Blue Book, our version brought the user to a list of resources in the given category. From self-observation, the Youth Opportunities page itself had a fairly stylish but effective setup. There were some dynamic graphics, which were interesting, and the website worked well on both desktop and mobile. We wanted our web version to be as simple as possible, and according to Gustafson and Keith (2016), the most effective web designs can work on any browser and any screen with as little variation as possible.

The goal of this project was to create a digital platform for the WCCC to provide their resource guide, allowing it to be more widely available to Worcester families, parents, and individuals, as well as more easily and frequently updated so we created a website version of the Blue Book. In the next chapter, we explain our methodology by describing a step-by-step plan on the creation of the digital Blue Book.

Methodology

The main goal for this project was to create a digital platform for the WCCC to provide their 'Blue Book', allowing it to be more widely available and easily and frequently updated. We created five step-by-step objectives to achieve this goal by the end of our 8-week project timeline:

1. Gain an understanding of what the Worcester community needs in a digital resource guide through research and interviews.
2. Gain an understanding of the WCCC and what it needs from a digital platform, the options it had available, and the limitations of those options.
3. Gain an understanding of other organizations and individuals who have developed similar digital resource guides and learn about the processes they followed.
4. Develop a digital platform that contains all of the necessary resources of the guide that is also easy to use and accessible to those in lower income families.
5. Develop a guide for the WCCC that instructs them on how to update the digital resource guide.

Our objectives involved a specific set of tasks that we completed over the course of our project timeline. We conducted research about the community, along with website development, to achieve the main goal and each objective. The WCCC members, along with the Worcester community, helped us create a digital version of their resource guide, the Blue Book. In doing so, these crucial resources will aid many more struggling Worcester families, parents, and individuals to receive the help they need.

Objective 1 - The Worcester Community

Objective 1 focused on understanding the Worcester community through research and interviews. Within the Worcester community, we focused on parents and social workers. Parents were co-creators and the primary target demographic for the Blue Book, as the guide is aimed to provide services to parents and their children. Social workers are active users of the Blue Book as they aid families in need and use the resources in the Book to do so. The goal of interviewing potential users and other developers was to gather information regarding the digital layout, field application, personal experiences, and general preferences.

To gather the information, we constructed the interviews uniquely for parents and social

workers. Using the material taught by Professor Roberts, as well as by Gillingham (2005), we understood the proper ways to interview each group. We hoped interviews could be face-to-face, however it was not possible due to the pandemic. Building rapport was the key to making the interviews work (Tedesco, 2013). We gathered rapport in Zoom interviews to allow for a more relaxed and comfortable setting which made people more inclined to share their personal experiences related to the Blue Book. Explaining the context around the interview and making sure not to talk down to someone was important. Instead, we framed the questions in a broader light that asked personal preferences on topics, instead of questioning for personal anecdotes (Gillingham, 2015). Due to the parents' strong personal experiences and connections with the Blue Book, we strictly asked layout and preference questions. Parents were the main users so understanding their technological capabilities, phone type, and layout preferences helped to create a product better suited for them. We interviewed five parents, asking them the questions shown in Appendix A. Among the parents were some who had previously worked on developing the Blue Book, which gave us great insight into the design ideas. For instance, the parents preferred buttons over scrolling on a webpage, and icons along with the category text. We also interviewed two people whose jobs included providing resources: a District Attorney and a member of the Worcester Housing Authority. They were both able to provide feedback on what features would be beneficial.

Objective 2 - The WCCC Staff and Seven Hills Communication

To gain an understanding of the WCCC, its impact, and the need for a resource guidebook we started and expanded communication with members of the WCCC and Seven Hills Foundation which allowed us to conduct interviews with our sponsor Anne Bureau, the program director at the WCCC, other WCCC workers, and Seven Hills employees.

We first set up an interview with Ms. Bureau. The interview format was semi-structured and consisted of six open-ended questions (Appendix B) that were related to one another which created an easy flow for our sponsor to give an in-depth response building off of previous answers. The interview was intended to provide information and clarification of the WCCC organization, goals, and expectations of the project design, and lastly, the intended audience. The questions specifically addressed the Blue Book created by the WCCC, the technological options for the online version of the Blue Book, and the abilities

of Ms. Bureau to distribute and maintain the future online version of the Book. Lastly, we wanted to address the WCCC's expectations on the interaction between us and the community with in-person interaction but, due to the uncertainty caused by the pandemic, we were unable to accomplish this.

When we conducted an interview with one of the members of the WCCC's parent foundation, Seven Hills, our questions changed to ask about the resources provided by their organization available for use in our project. We also gained a better understanding of the connection between the WCCC, Y.O.U. Inc., and Seven Hills organizations. Based on the information gathered from the interview we decided how to best use the resources available to help with the work and completion of the project. Also included during this section, we gained a general understanding of the impact COVID-19 had on the WCCC and their parent organizations in relation to their resources that were available to our project. However, since the WCCC was a part of two parent organizations we also became aware of the limitations and rules that were in place in relation to the creation of new online platforms. This led us to our next task in order to complete our second objective.

When we created a digital platform for the Blue Book, we needed to understand what we were allowed to work with and create, so we set up a line of communication and interviews with employees and IT personnel at the Seven Hills Foundation. The goal of communicating with Seven Hills was to understand the online platforms that were already in place and to see if we could create something similar to what they already had in place. Another reason was to determine if anyone at Seven Hills, specifically the IT department, would be able to assist Ms. Bureau in maintaining the digital platform we created in this project. We hoped we would be able to receive assistance from Seven Hills IT personnel during or after the project with maintaining the digital platform in order to help ease the job for Ms. Bureau in the future.

<u>Objective 3 - Other Digital Platforms</u>

In order to create a successful and useful digital platform, we needed to gain an understanding of how other organizations and individuals developed similar digital guides. We conducted research and set up interviews (Appendix D) with different individuals who had success in creating digital platforms for other organizations similar to the WCCC in the greater Worcester and Massachusetts area. In Biciuc (2019), the author talked about how communities

having a strong feeling of belonging and communicating with one another was a good way to share ideas with like-minded people. This thinking was used when we communicated and interviewed other individuals who already created or used apps in Worcester or Massachusetts. We interviewed a developer of the Stigma Free Worcester App, a Computer Science Professor from WPI, as well as a developer at Microsoft to learn about the tools and resources they used while developing digital platforms, as well as issues they had encountered that we kept in mind as we proceeded.

Although there were numerous possibilities for different features to be included in the digital platform, the information, resources, and format provided in the hard copy of the Blue Book needed to remain the same. We considered a specific user group, for instance low-wage workers, and how different design philosophies, such as simplification of navigation, would be more important to different groups (Sassen, 2016). Our task was not to change or add any information or resources to the Book but instead to improve the accessibility to the Book and make the Book as easy to use as possible for the people of Worcester. We also looked into including features in the digital platform such as quick access to specific chapters of the Book, features for urgent emergencies, and features possibly based on location. These features and feedback helped improve the overall use of the digital platform for all users.

<u>Objective 4 - Create a Digital Platform</u>

The first step of the fourth objective was to create a mock-up design of what the digital platform looked like. We had originally planned to develop both an app version and a website version, but after the information gained in Objective 3, we decided to focus on only developing a web version. We created a slideshow and design documents in order to outline and illustrate the function of the site, including its basic visual design, as well as where different functions were going to be located. After this, we presented these design concepts for the site to the WCCC and the prospective users of the site for feedback. This happened through a zoom meeting, which allowed for many people to view our design. At the end of the presentation, we asked for feedback on the design in the form of responses from the audience. We asked about ways to improve the design, and asked what parts confused the audience and needed to be changed. From here, we started the main development of the actual website. This involved using the information from Objective 2, where we learned what style guides Seven Hills used to

develop their site. With this information, we proceeded to develop the site using the same styles in order for Seven Hills to be able to integrate the site into theirs. As we designed the website, we took into consideration various graphic design elements of the interface in order to make it the most user friendly it could be. Some of these included consistent styling, large text, and logical organization (Pervaiz, 2020).

Another step in the development was creating a spreadsheet that could store the information included in the Blue Book. This involved setting up the spreadsheet for the stored information, as well as manually inputting the current information stored in the Blue Book, such as a company's name, phone number, hours of operation, and address. Afterwards, each page of the spreadsheet was exported as a CSV file for use in the web page itself. A JavaScript script was created that extracted the data from the CSV file and displayed the relevant information of the webpage.

Once our platform began development, we had people from our user-base begin to test its functionality as soon as possible. Getting feedback as early as possible was vital, since it allowed for feedback to be received and implemented in small portions. The feedback we received existed in the form of direct feedback from those who used the site. We provided a link to the beta version of the website, as well as provided images of the site for earlier stages of development. Afterwards, we asked for general feedback, and then asked targeted questions (Appendix F) on the website, such as how they felt about the size of the text, how responsive it felt, etc. The final step was to revise the website according to this feedback.

<u>Objective 5 - Create an Updatable System</u>

Our website was created so that the digital platform was easy for the members of the WCCC and Seven Hills to update and maintain. After using the information, we gathered from Objectives 1 and 2, we developed a platform for the WCCC to continually update the website without ever needing to access or change the actual code, as described in Objective 4. To achieve this, we compiled the information from the Blue Book into several CSV documents. This also made ensuring the security of the website much easier, as there was no need for any type of login inside the application itself. Instead, there only needed to be security protocols that protected the HTTP server on which the CSVs were hosted (Restricting access to web pages, 2009). A PDF version of the Blue Book was also included as a downloadable file on the website.

In the final weeks of our project, we were given notice that the Seven Hills Foundation was undergoing a redesign of their entire website infrastructure. As a result, we were unable to hold focus groups with our sponsor to provide information on how to upload new and updated CSV files. However, we did still develop a guide on how to update the CSV files and a small guide to the code we developed. This will allow for Seven Hills to integrate our webpage into their new website infrastructure and will make it easier for our sponsor to update the CSV files once it is fully integrated.

Findings

When working on this project for the WCCC, we made the decision to organize our findings and research into four main groups. These were recurring themes that we consistently noticed while researching the community, interviewing people who offered great insight, and receiving feedback from Worcester parents and our sponsor about the usability and functionality of our website. These themes included user experience findings, technical findings, design-related findings, and sustainability related findings.

Our **user experience findings** included learning about the array of tech-savviness users had with technology and we created our website to abide their experience. We spoke with parents from the Worcester community about what we should include on the website to make it user-friendly and easier to navigate. One Worcester parent recommended the implementation of a search bar, so that the user could find information quickly and with ease. Another parent recommended including interactable buttons with icons so this way users would be able to locate resources easily. This parent also informed us that including words and icons on these buttons would be beneficial since it would help Blue Book users in a crisis situation find the resources they need quickly and with ease. The images used to represent these icons needed to be vetted by a council to ensure that they were not triggering to those in crisis situations. Other interviews with Worcester parents really pushed us to make the website as easy as possible to use since there are members of the Worcester community who use the Blue Book that are both young and old. An anonymous Worcester parent even described a dilemma that older users have. The older generation does not have much expertise with using technology. Grandparents or older adults will usually turn to their children or younger people they know since they have noticed that the younger generation understands technology differently since most of these types of individuals grew up using technology in their everyday lives.

Our **technical findings** included what we learned while creating the website, what worked and what did not, and how we came to the decision to make a website instead of an app version of the Blue Book. We held several interviews with individuals who were experienced in app and website development, and we determined the best approach for a digital version of the Blue Book involved a mobile friendly website. A number of factors went into this decision including technical capabilities of the WCCC staff, timeframe of the project, and features that should be included or excluded from the website. During an interview with a member from the

WPI project team, Stigma Free Worcester, they expressed to us that getting approval from both Apple's App Store and the Google Play Store would not be feasible for us, since both Apple and Google generally do not approve apps that can essentially emulate existing websites without extra features. This same individual explained that the Stigma Free Worcester team was able to get around this due to their use of location services. However, this type of feature would not have been feasible for us in the given time frame we had to finish our project. We also learned in another interview with a computer science professor from WPI that making an app version of the Blue Book was a very large task given the amount of time our team had to finish our project. This professor recommended that we design a website version of the Blue Book that was well polished and complete rather than develop an app and website that could both be less than sufficient in terms of user-friendliness and usability. They expressed that we should pursue the simplest and most successful approach rather than create a product that is less than sufficient. It would be better for the community to have a website they can rely on for their needs rather than an app and website that will not be user friendly or easy to navigate. It is more important for members of the Worcester community to access crucial information to help those in crisis situations and those who are struggling to meet their needs. This is why we made the decision to create a website version of the Blue Book that could reach out to more people while at the same time creating a product that the Worcester community could use with ease.

Our **design-related findings** included conforming with the parent company Seven Hills' branding guidelines while designing the website, along with adding user-friendly features to make the website easy to navigate. The WCCC is part of Seven Hills and as a result, any additional web pages developed needed to conform with the parent company branding. We conducted an interview with our sponsor and the parent company Seven Hills to make sure that we were on the right track with the design and formatting of this website. During this interview members of the Seven Hills informed us about a style guide and feedback for what type of designs were acceptable and which designs could be changed. This led to the following design-related findings where we added user-friendly features to make the website easy to navigate. It was also important to include WCCC branding as much as possible onto the webpage despite it technically being a Seven Hills website. Worcester parents and members of the WCCC expressed their concerns, in multiple interviews, about the placement of logos on the site from different sponsors that have supported their organization and the Blue Book, as well as the logo

for the WCCC itself. They wanted these logos to be displayed in a way that the user knows exactly where they are and that they are using the WCCC's online version of the Blue Book. We were able to find a suitable balance by formatting the placement and layout of brands to represent both the Seven Hills organization, the WCCC, and the sponsors of the WCCC.

Sustainability findings included information about how our sponsor, and the parent company Seven Hills, will handle the website and update it through an easy to use "How To" user guide. In an interview with our sponsor, they explained that the user guide should be very simple to understand so that anyone trying to update or add information to the Blue Book website can do it with ease. Our guide needed to explain how to change information manually in the CSV file containing all of the information in the Blue Book. It would also need to include instructions for how to save the CSV file and then pass that altered CSV file to the developers at Seven Hills for them to implement onto the website to change information. In order for our sponsor and Seven Hills to update the website independently, we determined that our user guide must explain, step-by-step, every part of the updating process to ensure frequent and easy updates to the website.

Recommendations and Conclusions

   After the completion of our project, we offered our sponsor some recommendations regarding the technical management of the website along with the marketing of the website to make users aware of the completed online version of the Blue Book.

   For our **technical recommendations** and as an extra part of the website, we recommend adding in features like page turning and dynamic buttons to accommodate our users who originally recommended these features as feedback about our website. We also recommend finding a way to make the website cache accessible offline to provide the Blue Book to members of the community who do not have easy access to the internet.

   We also recommend making a new JavaScript or Python script to update all necessary CSV files by sorting new resources that are put into one single file, instead of manually inputting new information on the spreadsheet. In order to do this and make the process easier for our sponsor to edit the CSV, we discussed with our sponsor and Seven Hills during an interview about creating a user interface to help Seven Hills and our sponsor edit the Blue Book information on the website with more ease and accuracy.

   The user interface could include category boxes that would give our sponsor many options on what type of information would need to be added to the Blue Book. For example, when our sponsor needs to change information a user interface would be displayed that would allow our sponsor to enter information easily rather than digging through a vast amount of data to add in a new category or company. The user interface will add in information from the Blue Book automatically and our sponsor would simply enter any information that needs to be added from the Blue Book into the user interface, and it will enter that information onto the CSV file to be displayed on the website automatically. In order to accomplish this, our professor, Laura Roberts, recommended gathering WPI students to form an additional project team to assist Seven Hills and our sponsor with this website addition. We recommend for them to focus on creating the user-interface and use it to incorporate any information changes to the CSV Blue Book file, or possibly even convert the CSVs into a database.

   We also recommend for them to expand on the website by incorporating more features and additions that will make it even easier for users to navigate the web page. One feature they could include on the website was the creation of a "What's New" tab that can let users know

about any new information that has been added to the Blue Book, that may be able to help them attain new resources.

In order to **market** the Blue Book and let community members know about the finished website, we suggest creating a QR code that when scanned takes the user to the Blue Book website homepage directly. This QR code can be included in the printed editions of the Blue Book so that users can access the website version of the Blue Book if they also have the hardcopy version.

At the end of our IQP project, we successfully achieved our main goal of creating a functional and user-friendly digital platform version of the Blue Book while meeting all of the necessary requirements of our sponsor. Ultimately, we will be passing on the website we completed to Seven Hills and they will work with another WPI team to make additions to the Blue Book website. Due to the online nature of the Blue Book, it will be more widely accessible for members of the Worcester community to use. This we hope will allow for more exposure and usage of the Blue Book allowing individuals in need to receive the help they deserve.

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