A Work Plan for Creating a Database and Online Platform for Youth Job Opportunities in Worcester

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Abstract

The goal of this project is to identify a work plan for creating a database and online platform for youth job opportunities in Worcester. To combat youth unemployment, the Worcester Community Action Council manages programs to educate youth and give them valuable work experiences. A subdivision of the WCAC, the Job and Education Center, works closely with the Worcester Task Force in order to provide working opportunities for the youth. With multiple programs and organizations involved, there is a gap in data collection and sharing. A work plan was developed through database research, numerous interviews with stakeholders inside the Task Force, and database developers. This work plan will serve as a resource for the WCAC to move forward with development for their program needs.

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The WCAC and other Task Force members provide youths with more educational, job, and life opportunities in the city of Worcester, and we acknowledge their tremendous efforts to help the community. We hope that our research and project helps provide a clear path for developing a youth tracking database in the future.

We also thank Professor Purvi Shah and Professor Sarah Strauss from Worcester Polytechnic Institute for guiding our team, and assisting with ideas and ways to think about our project objectives and goals through the entirety of the project.

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Executive Summary

Introduction

Increasing youth unemployment in the city of Worcester, Massachusetts is a rising issue within the community. Youths ages 16-24 make up a large percentage of the currently unemployed population in the city. The Worcester Community Action Council (WCAC) plays a large role in many of these youth's lives including job readiness training, skill training, computer training, job placement assistance, multiple forms of counselling, and much more. Although they are successful in helping the youth, they want to be able to analyze data to know exactly how successful their programs really are to make changes to benefit the youth even more. To be able to improve their programs, the WCAC needs a database that will allow them to track data on youths as they reach milestones within the program and stay connected with the youth once they age out of their programs. This need for a database led to a partnership with WPI's Worcester Community Project Center (WCPC) to find the best ways to move forward in developing a database that will help them in the long run.

Mission, Methods, and Objectives

The goal of this project was to develop a work plan for the WCAC to implement a tracking database and online data. For project objectives we:

- Developed an understanding of how the WCAC and Task Force operates as a whole and how they collect data from the youths.
- Identified the best course of action to help WCAC collate data so that they can address the needs of unemployed youth in the City of Worcester.

∉ Created a detailed work plan and a data management map (in the form of two infographics) for implementing a database that tracks youth career pathways, including employment history and life skill achievements, and an interactive platform/website for youth and youth advocates to access job opportunities.

∉ Suggest a potential work plan to continue data collection after the youth graduate from the WCAC program.

We completed these objectives through semi-structured interviews with the WCAC, Worcester Youth Task Force, database users and developers, community action councils around the northeast region, and alumni/youth participants of the WCAC programs.

Results and Findings

After analyzing the interview summaries of the semi-structured interviews conducted, we found the following:

Finding 1: A collaborative tracking database solves miscommunication between the Worcester Youths Task Force and the Youth.

Finding 2: The Data Collection Milestones of the WCAC and their subsections: Outreach.

Finding 3: The Data Collection Milestones of the WCAC and their subsections: Enrollment.

Finding 4: The Data Collection Milestones of the WCAC and their subsections: Program Participation

Finding 5: The Data Collection Milestones of the WCAC and their subsections: Outcome or Achievement.

Finding 6: Databases can be developed to the needs of the WCAC.

Finding 7: The tracking database needs to be scalable across multiple organizations.

Finding 8: Creating a database with a professional company comes at a price.

Finding 9: New touchpoints were found through intake form examination.

For finding 1, we discovered that one of the main difficulties for the Task Force was miscommunication with the youth, and that an online database would be an efficient way to fix it. Findings 2 through 5 represent the data collection milestones that the WCAC uses when putting Youth through their programs. These are places where data can be collected and placed in a database in order to track youth progress. Finding 6 is that the needs of the WCAC can be met through a tracking database. Finding 7 represents the need for the tracking database to be able to expand across organization through the Worcester Youth Task Force after the initial implementation into the WCAC. Finding 8 explains that the cost of creating a database using a professional company comes with heavy upfront costs, along with monthly fees thereafter. Lastly, we found through examining WCAC intake forms that there are more data collection touchpoints for tracking information about the Youth participants.

Recommendations

Based on our findings we were able to develop two different recommendations regarding the implementation of a database for the WCAC.

Recommendation 1: Include Outreach Steps in Intake Form

Recommendation 2: Add “Other Programs” in Enrollment Phase

Recommendation 3: Add Participate in LinkedIn/Alumni Outreach Program

Recommendation 4: Add 1-5 Year Outcome Check In

Recommendation 5: Hire a database developer to create a tracking database.

Recommendation 6: WPI and WCAC work together to develop another WPI project team involving senior computer science or data science students to develop a database.

Our first recommendation is for the WCAC to include outreach steps on their youth intake forms, in order to gain a better understanding of where youth are coming from and where they are going after their programs. Our second recommendation would be to verify the additional programs that each youth has already been a part of within the Task Force during the Enrollment phase to have a better understanding of youth involvement. Third, we recommended the addition of a program that helps youth members set up and learn to use LinkedIn in order to better expand the WCAC's alumni reach. Our fourth recommendation is for the WCAC to add a one to five year check-in for alumni that have completed their program in order to track their program effectiveness. For recommendation 5, we suggested three different database developers for the WCAC to choose from. Each developer has their listed positives and negatives, cost of the services, and the past organizations that they have worked with. This recommendation also discusses the need for a grant to cover the costs of the database implementation. For recommendation 6 we suggested that the WCAC partners with WPI again for the development of the tracking database. All seniors are required to complete a Major Qualifying Project, or MQP, prior to graduation. This project would be completed by a Computer science or data science major qualifying team over a five to seven-month period or three terms.

Chapter 1: Introduction

Increasing youth unemployment in the city of Worcester, is a rising issue within the community. In a study done in 2017 by Clark University, 17.4% of the youths in Worcester ages 16-19 were unemployed. 9.6% of ages 20-24 were recorded to be unemployed as well (Ross et al., 2017). These two age groups were among the highest unemployment rates within the community. The same Clark study also determined that youth unemployment for people aged 16 to 24 increased for minority groups and for people facing challenges with homelessness, language barriers, and for people living in foster care or within the juvenile system (Ross et al., 2017). The Worcester Community Action Council and leaders within the organization oversee operations in order to decrease these youth unemployment percentages, within the categories mentioned above, in the city of Worcester.

The Worcester Community Action Council is celebrating their 55th year of helping community members become economically self-sufficient. Through "programs, partnerships, and advocacy" the WCAC is a "lifeline to those who need it, a resource for a lifetime when its required, and a life changing force that alters a person's or family's path" ("*Jobs and Education*," 2018). Annually, the WCAC serves more than 75,000 people in Worcester and 45 surrounding communities. They offer a variety of safety-net and economic self-sufficiency programs such as fuel assistance and energy services, Early Head Start and Head Start, pregnant and parenting teen services, work readiness, financial capability, emergency food assistance, and much more.

Along with all these services, WCAC also supports a specific unit called the Youth Jobs Task Force. Their main goal is to increase youth employment within the community. In their attempt to address these problems, the WCAC believes a trackable and accessible database and website for both youths and youth advocates is needed in order to make sure current youth employment programs are effective.

This Task Force is made up of multiple different organizations such as the City Manager's Office, Division of Youth Opportunities, Department of Public Health, MassHire Central WorkForce and Board, and Healthy Greater Worcester. Together, they all invest in increasing youth employment throughout the district. Since there are so many different organizations all with a similar goal of helping the youth and that are involved with the Action Council, it at times is difficult to collect useful data from all different organizations from the time a youth enters a WCAC program to the time they leave and even after that. All these organizations are connected; however, their data is not. Therefore, the data collected is spread out, and is not easily accessible to be analyzed in order to ensure these federally funded programs are working in the youth's favor. Having an interactive database and online platform will allow for useful data tracking and analyzing. With an idea like this in mind, the Task Force would be able to keep order of youth participation across all programs and learn about program effectiveness after youths age out of the program.

Our team was selected to work with the WCAC as a first step in the direction of implementing a database into their programs. Our goal for the WCAC was to first identify the best course of action about addressing the needs of unemployed youth in the city of Worcester. With this, we aimed to develop a workplan that will help build or find an existing database that tracks youth career pathways, including employment history, and life skill achievements. To coincide with a database that tracks the success of the programs of the WCAC, there is a need for implementing a platform or interactive website for youth and youth advocates to access job opportunities across the Worcester community. We have done our own research and work on what type of database and online platform will work best for them.

Following this introductory section, we present the background information and research we conducted in order to understand the goal of our project and the resources we needed in order to move forward. Next, we describe the methods that we used in order to gain professional information from experts from different organizations and youth WCAC members. Finally, we list the findings from our research, along with our recommendations for the WCAC to move forward with a business plan to transition into using a database and online platform.

Chapter 2: Background

The background presents the research our team did to get a better understanding of the tasks we dealt with to complete the project goals and deliverables that were mentioned above. We started off by defining the problem with youth job opportunities. Then, we touched upon who the Worcester Community Action Council is, and what their role is to better the Worcester community. Next, we mentioned agencies within the WCAC, specifically the Job and Education Center and the Task Force. There are multiple agencies that work together to provide educational and working opportunities for youth that face barriers. We then gave background information on what a work plan is and how it will be beneficial to the WCAC to move forward with their organizational goals of implementing a database and online platform. For the WCAC to automate their processes and analyze data, the tools they mentioned included a tracking database and online platform. Therefore, we will also take you through our research on benefits of those tools and how they can be used in order to allow the WCAC to track the youth's journey through their programs.

2.1 Youth Job Opportunities/Unemployment

As mentioned before, youth unemployment for people aged 16 to 24 increases for minority groups and for people facing at home challenges. In addition to these factors, aspects such as inadequate secondary education and a lack of training and apprenticeship opportunities were also cited as reasons for lower employment. This was true for both the Worcester area, as well as disconnected youths at a national level. Massachusetts Institute of a New Commonwealth, a nonprofit that promotes the growth of the middle class through civic engagement, estimates that there are about 3,400 disconnected youth. About 800 of them are between the ages of 16-19 and the rest of the 2,600 disconnected youth are between the ages of 20-24 (Ross et al., 2017).

Looking at the history of youth employment over the past decade can help with understanding the context of the current situation. Youth employment at the national level in 2010 was at its lowest level in sixty years, mostly due to the recession brought by the market crash in 2007. Since then, youth employment has been on the rise all around the nation, including Worcester. This can at least be partially credited to the employment programs that Worcester has put into place. These programs offer youth in the area multiple opportunities for "first job" and workplace experience. With all the non-profit and government partners, including the WCAC, there is a lot of youth employment support through integrating youth and workplace development (Ross et al., 2017).

This all relates to the goal of our project: identifying a work plan for creating a tracking database and online platform for youth job opportunities in Worcester. Based on the Worcester youth employment study done at Clark University, an effective strategy to connect unemployed youth to job opportunities is to identify what level of readiness they have for employment, (Ross et al., 2017). This can be determined by language skills, level of education, prior work experience and skills, and other factors. The youth can then be connected to companies and work programs based on the information acquired from those factors. If the WCAC were to implement a database that can connect youth to job opportunities in the Worcester area, then applying a system that allows this information to be recorded could potentially be very beneficial.

2.2 Worcester Community Action Council

The Worcester Community Action Council, Inc. was established in 1965 as the locally designated "community action" agency for the Economic Opportunity Act of 1964. The goal of this act was to combat poverty in the United States by opening to everyone the opportunity for education, training, and the opportunity to work. The WCAC specifically fits into the Work-

Training Programs section from the Economic Opportunity Act which states that its purpose is to provide useful work experience opportunities for unemployed young men and women (United States, 1964). Today, the WCAC currently operates because of this act, and serves as an umbrella agency offering a variety of education, employment, and social service programs for youth in the Worcester area between the ages of 14-24. One of the many initiatives the WCAC runs is the Job and Education Center which offers educational and employment programs for youth ages 16-24 years old who have economical disadvantages. A few main reasons for youth joining a program is if they have been involved in the court system, have been in foster care, and/or are homeless. These events have caused some to have fallen off the traditional educational pathway and through the WCAC they can benefit from alternative classroom settings and learning styles ("*Jobs and Education*," 2018).

Within the Job and Education Center, the WCAC manages the Youthworks and summer employment programs. Youth (16-21 years) participate in a one week professionally developed work readiness training, followed by six weeks of paid, on the job work experience. Youth are supported by a case manager for the duration of the program and are placed at one of WCAC's trusted business partner's worksites. However, eligibility requirements apply, and work experience duration may change based on the funding received ("*Jobs and Education*," 2018). The funding of the program is of great importance as the employment sites that the youth work at are not the ones paying for their labor. The WCAC is the actual employer and takes the responsibility of paying the youths a weekly paycheck during a face-to-face checkup.

The WCAC also works in parallel with the Worcester Youth Job Task Force, a group consisting of members from different departments and agencies around Worcester. The WCAC convenes the Task Force to lead conversations about increasing youth employment in Worcester.

In the Task Force's efforts to create youth jobs opportunities in Worcester, it is important to know if current youth employment programs are effective, and youth and their advocates need easy access to youth-specific job opportunities in Worcester. However, there is no database or website to address this need. With that said, the Task Force has created a subcommittee to advance the development of its efforts. These subcommittee partners include City Manager's Office, Division of Youth Opportunities, Department of Public Health, MassHire Central WorkForce Board, and Healthy Greater Worcester. The WCAC needs a database and online platform that can connect all these subcommittees to be the most beneficial for the youths.

2.3 Work Plan

At the conclusion of our project we handed over our final work plan to the Worcester Community Action Council. Our plan served "to facilitate the performance of the task or goal at hand" (Gollwitzer, 1996, p. 288). Our work plan will allow the WCAC to follow a schedule and a clear path of what steps to take to create their tracking database and online platform. This plan is imperative for the betterment of all varieties of business projects and creating this template will allow for everyone within the organization to have a clear vision of the overarching goal for the project.

A work plan is a living document; therefore, the plan we provided will not be concrete but will serve as a control to ensure completion. There will be minute problems and goal changing every day, so we had to anticipate things, internally and externally, for example financing or outsourcing, that may have gone wrong (Gollwitzer, 1996). Because of these anticipations, we were able to provide a flexible timeline of milestones, key performance indicators, costs, goals, and project completion guidelines (Kennett, 2014). To guarantee these considerations, we provided critical paths and a Gantt chart. Doing this showed relationships between tasks and allowed for a chronological plan (Abbasian-Hosseini et al., 2017). Putting these sequences into a Gantt chart allowed for trackable start and endpoints of tasks, which is essential for breakdowns of tasks and the final deadline.

Our final deadline for this project was imposed by our final IQP project. Therefore, by creating a final work plan for the WCAC, our sponsor and other project teams will be able to follow and pick up where we left off.

2.4 Tracking Database

Collecting and evaluating reliable, meaningful data is a significant challenge in designing and maintaining programs to help youth enter the workforce or school. The data collection tools and assessments, of the Worcester Community Action Council, need to be further developed and improved. While we worked with the WCAC and the Worcester Task Force, it was evident that data collection had taken place and was recorded, however, the data was unorganized and completed by paper, rather than online. Therefore, a database management system was essential for tracking the youth in the Worcester community and measuring the effectiveness of the WCAC youth programs.

To understand the significance of a database management system (DBMS), it is important to have a grasp on the concept of what it is. A DBMS organizes and manages a large amount of information within a single software application. Data can be categorized and structured to suit the needs of the organization. Data is entered into the system and accessed on a routine basis by assigned users. Each user may have an assigned password to gain access to their part of the system. Multiple users can use the system at the same time in different ways (Admin, 2017). However, there are many different types of databases, each with their own way of handling data storage. Understanding each database and its characteristics is crucial for making the right choice when applying it to work. When looking at modern day databases, relational are the most prominent compared to non-relational. The difference between the two lies with the need to know structured query language (SQL), which grants access to manipulate the data. SQL has well established standards and is widely maintained and sold within multiple corporations. However, non-relational databases have become more popular recently, with the growing need for unstructured data storage. With that said, non-relational databases are less widely accepted and tend to need specific expertise to develop the database (Hammink, 2018). Based on the needs of the WCAC, we recommended to use a relational database, as the data they plan on collecting is more structured, and the outside corporation that WCAC will work with, will be more likely able to accept this database type.

The implementation of a tracking database allows for Worcester Youth Job Task Force partners to track youth participation in job programs and to follow-up on the youth's progress on a longer-term basis. However, there are some definitional issues regarding the word "tracking". People tend to believe it has connotations of "surveillance" and "big brother." A "track" is a mark or a series of marks or footprints. "Tracking" is the process of tracing that series or mark of footprints. The mapping and tracking of young people are a central policy issue in the context of national and local level concerns about tackling disaffection, raising standards and addressing social exclusion. The underlying rationale for such an activity is to help young people, and notably vulnerable young people, through transitions - especially those into the labor market (Green, Maguire & Canny, 2001). With that said, it was important the database created allowed for documentation of different touchpoints that the WCAC and Task Force could use to manage the tracking of youths around the Worcester community.

2.5 Online Platform

When we discussed the potential of an online platform to implement a tracking database, it was important to clarify what an online platform is and how it can function. This helps the work plan be clear with its end goal and functionality. The Organization for Economic Cooperation and Development describes an online platform as "a digital service that facilitates interactions between two distinct but interdependent users (whether firms or individuals) who interact through service via the internet" (Organization for Economic Cooperation and Development [OCED], 2019). The report goes on to say that while this definition is straightforward, the definition of a "platform" is not. While it was assumed that some type of online application will be used in the implementation of the database, an effective platform would have to be identified. This would ensure the successful operation of the database and its ability to track information. The way the two users interact online would need to be taken into consideration, as the level of interaction would need to somehow specified. Once this information is gathered, it can be put into the work plan of developing an application that allows for smooth interaction between the users.

Since there would be no financial transactions within this platform, users should be treated appropriately. The OECD (2019) reports that many governments, non-profit, and non-commercial organizations have implemented online platforms for identity and access management. An example of this is a system in which public administrators within the European Commission provide citizens with government applications and information via online platforms (OCED, 2019). Within these platforms, users are given access to civilian and customer information that otherwise may not be available to commercial company platforms. With this comes a certain level of responsibility for protecting user data by the organization, which is the

WCAC in this case. The workplan for creating such a platform would need to include a discussion of how to protect user information.

Within the definition of an online platform, the word “users” is interpreted very broadly. It can be used to describe consumers, businesses, or government entities. Users can also be buyers or sellers. For a tracking database, the users are the WCAC, the Task Force, the prospective and current employers, and the youth members within the programs who the WCAC is obtaining the data and information from. This was important to define in order to clarify the users within the platform. Once the users were defined, the interactions between the users could be designed to effectively complement the database. This allows more efficient data collection for the WCAC. It also allows for a system that is easy to use between users within the online platform.

In addition to the functionality of an online platform, it is beneficial to point out some of the positives that an online platform can bring to the WCAC program. One potential benefit would be increased user participation. A 2018 student report from WPI conducted on alumni engagement suggested that implementing an online platform can increase user engagement by simplifying the process of allowing users to interact (Durr et al., 2015). This helped differentiate other online platforms and simplify the process of alumni connection to the University. This idea has been applied to the WCAC as well. With a single platform in which users can interact and exchange data and information, the process of getting members to participate could greatly improve. Increased participation would allow for information about youth unemployment in Worcester to be obtained by the WCAC. With this information compiled neatly into one application, the organization can better identify potential solutions.

Additional studies support user experience through online platforms as well. A study investigated the effectiveness of online platforms in student learning and reported a 91 percent positive approval rating from the students who took part in the study (McBrien, Cheng, & Jones, 2009). Students stated that they were comfortable interacting with other online users and expressed they received quality services. Most of the students who took part in this study were undergraduate college students, who share a similar age range to that of most of the unemployed youth in Worcester. The study also reported that students were more comfortable providing feedback to instructors as well. If the online platform were to implement a feedback system that could be used by youth members, this suggests that the WCAC could more easily obtain feedback to improve their services.

Though there have been plenty of benefits suggested by online platforms, drawbacks should be discussed as well. One potential drawback could be that some of the youth members would not be able to access the platform. Online platforms are connected to the internet. If youth members have limited internet access, then obtaining their information in order to successfully track their progress could be challenging. This could perhaps lead to skewed statistics and misinformation, which in turn could lead to less effective solutions. Another drawback would be the level of usability for youth who deal with disabilities or language barriers. Even with available internet access, these members could have a difficult time interacting with the platform as well. A study found that students with disabilities perceived different online learning platforms as “confusing,” lessening the platforms’ effectiveness on helping students in their learning process (Coronel, 2008). Potential solutions for these drawbacks should be considered in the work plan for creating the database in order to combat these issues.

With this knowledge of the effectiveness of online platforms, the WCAC should be able to implement a tracking database into an online platform that contains an interactive portal in which youth in the program can interact with. This can increase user involvement within the program and allow for progress to be easily tracked. This will allow the WCAC to more effectively impact their youth and lead to more opportunities to decrease youth unemployment. One example of an organization that has used a tracking database with success in the past is the Northeast Structural Genomics Consortium (NESG) who in 2001 were able to successfully track proteins within X-rays that contained information about cloning and biological purification (Bertone et al, 2001). Given the technical requirements of such an endeavor, it is proposed that a tracking database can successfully aid the WCAC in tracking youth members within their system.

Chapter 3: Methodology

3.1 Understanding the Background

In order to support the WCAC, we first needed to gain an understanding of Worcester youth unemployment, youth tracking databases, online platforms, and the WCAC. This insight was obtained through one-on-one interviews. The entire data collection and analysis process is detailed in the following sections.

3.2 Mission Statement

The goal of this project and that purpose of these interviews was to create a work plan for implementing a tracking database and online platform/portal for youth job opportunities in Worcester. The WCAC and the Task Force believed that a youth-tracking database and a youth job website were two of the most effective ways to address the current problem of youth unemployment in the Worcester area. The following objectives were considered to achieve this goal.

Objective 1: Develop an understanding of how the Task Force operates as a whole and how they collect data from the youths.

Objective 2: Identify the best course of action to help WCAC collate data so that they can address the needs of unemployed youth in the City of Worcester.

Objective 3: Create a detailed work plan and a data management map (in the form of two infographics) for implementing a database that tracks youth career pathways, including employment history and life skill achievements, and an interactive platform/website for youth and youth advocates to access job opportunities.

Objective 4: Suggest a potential work plan to continue data collection after the youth graduate from the WCAC program.

With these objectives in mind, our team focused on providing the WCAC with accessible, standardized, and useful data collection from the beginning of a youth's journey through the program and thereafter as an alumnus. This will help improve program efficiency for the youth and ensure the WCAC that their programs are evolving and benefitting youths that face potential barriers. Below we discuss our methods to achieve these objectives.

3.3 The Institutional Review Board and Human Subjects Research

The research methods we used involved collecting personal information/data from human subjects. Therefore, we ensured that we were respecting the privacy and the rights of those individuals. To do so, we provided every interview participant a detailed informed consent form (based on IRB requirements) to read and sign. This form can be found in Appendix A.

3.4 The Interview Method

For qualitative research, the most widely employed tool for collecting information and data is interviews (Cassell, 2005). In the common sense, when people refer to the word 'interviewing,' most come up with the idea of two or more people discussing a certain topic to one another. In research, it is "…a basic mode of inquiry" with "…an interest in other individuals'' stories because they are of worth (Seidman, 2012, p. 8). Given this, there are several different types of interviews that be implemented in social research. Each type (of interview) has its own objective and focus. "Research questions and the information needed to provide holistic answers to these questions will determine the most convenient type to be employed" (Alsaawi, 2014, p. 150).

The first interview type is structured interviews. This type of interview is a controlled way to obtain information from interviewees. In other words, it is a “pre-planned interview where the researcher writes down the interview questions before conducting the interview” (Alsaawi, 2014, pp. 150-151). Such a format is an effective way to keep the interview highly focused on the target topic (Bryman, 2016). However, this type of interview lacks richness and limits the availability of in-depth data. The variation among responses is limited due to the strict interview format that is used.

The second type of interview method is unstructured interviews. This type of interview is opposite to the above, in that the flexibility type is wide open. Interviewees can elaborate, leading in unpredictable directions (Alsaawi, 2014). This type is like a conversation in which the interviewer might ask a single question and then the interviewee has the choice about the extent which he/she responds (Bryman, 2016).

The next type of interview is quite common for social researchers to conduct which is a semi-structured interview. This type of interview is a mix of the two types mentioned above, whereas the questions are pre-planned prior to the interview but the interviewer gives the interviewee the chance to elaborate and explain issues using open-ended questions. This type is appropriate to researches who have an overview of their topic so that they can ask questions (Alsaawi, 2014). However, they do not prefer to use a structured format which may hinder the depth and richness of the responses (Bryman, 2016). As a group we used this interview structure because we wanted our interviews to be more of a conversation than an interview. A structured interview would have limited the open responses we were able to receive, which in turn would limit our overall findings.

The last type of interview is a focus group interview which originated in market research in the early 1990's (Robson, 2011). This interview can be structured, semi-structured, or unstructured. This type involves a brainstorming focus group of usually six to twelve interviewees (Dörnyei, 2007). Interviewees can challenge, argue, and debate with each other which can lead to the emergence of in-depth and rich data.

Before heading towards the practical stage of the interview, the researcher should be aware of how to select the participants. The most common approach is choosing participants randomly. However, due to the nature of setting up interviews in a short period of time it is difficult to employ a random approach. Therefore, "self-selection is more appropriate than randomness, because the participants must give permission to be interviewed" (Alsaawi, 2014, p. 152). Selecting a sampling frame is another key component pre-interview. Our group's interviewing and research methods evolved throughout our research. As we conducted more interviews, we adjusted our questions as needed to ensure they provided clarity and added questions if multiple interviewees brought up similar issues that had not been initially identified. Our questions were designed to spark a conversation, rather than conducting a traditional interview, which has a pattern of question & answer, then questions & answer (Vähäsantanen & Saarinen, 2012). This creates a comfortable relationship between interviewer and interviewee. A controlled dialogue lowered any potential power barriers. Therefore, we prepared a guided dialogue for different directions the interview may have turned to, created flexibility within our research. This also helped our group prepare for interviewees who did not understand our research and may not have understood the questions that were being asked and why we were asking them. In our case, the sampling frame was given to us by member of the WCAC, which was a list of members of the Worcester Youth Task Force. Lastly, our sampling method was a convenience sample since our team needed a population readily available and chosen in a non-random way.

Furthermore, it has been agreed that we choose no exact number of participants to be interviewed. As we learned more from each conversation, we gained more information and more contacts that we should reach out to. Because of this, we reached out to more people that became necessary to talk to as we went along. Two criteria relating to the size of the sample should be kept in mind (Seidman, 2012). The first one is sufficiency which be felt by the interviewer him/herself. If we reeled the conversation back in to get the information needed, the conversations were successful. “The other criterion is saturation, in which the interviewer begins to hear some of the same information he/she has already obtained from previous interviewees” (Alsaawi, 2014, p. 152). In our case, our sample size was relatively small, however, it was concentrated due to the low number of individuals we needed to hear from.

Before starting to conduct an interview, the researcher should be ready with his/her essential tool, namely the ‘recorder.’ It is crucial to record interviews – either audio or video – especially in the case of semi-structured and unstructured ones. Note taking is not always enough due to the huge amount of data the researcher will receive. However, participants must agree to be recorded, weather audio or video (Alsaawi, 2014). Good interviews should seem natural, but contain needed detail (Dörnyei, 2007). In practice, the interviewer should minimize his/her interruptions to the minimum and give the interviewee as much time as necessary to elaborate and explain any issue.

After conducting the interview, the researcher then moves to the analysis phase. This analysis stage is a complex process due to the huge amount of data recorded (Carey & Smith, 1994). It begins with transcribing the data from being spoken to being written. There are different types of qualitative analysis. According to Robson (2011), the three most common approaches are: a) quasi-statistical approach b) thematic coding approach c) grounded theory approach.

When analyzing the data, the researcher needs to carefully reflect on what he/she has learned from conduction interviews, transcribing them, and labelling them into themes and categories, and then with regard to what knowledge the interviews and the participants bring with them (Seidman, 2012). After learning more about the interview process, we applied the above literature to our own interview methods.

3.5 Interview Plan

In order to take precautionary measures, we sent interviewees an overview of what our project was as well as a consent form three days ahead of time. This way, if there were any questions about what or why we were doing research, we were able to answer them ahead of the interview via email. This also served as an interest indicator; if the interviewee lost interest before the interview, we were able to be more effective with our time and interview someone else in their place.

Due to the recent Pandemic, COVID-19, our methods have not changed; however, the tools we are using to complete our methods have. We quickly adapted to doing our interviews virtually, through phone calls, emails, and a variety of different video call software's like Zoom and Google Hangout. Every candidate that we interviewed was going through the same global crisis, therefore, they understood the need for this transition, and we proceeded to collect data which is talked about in our findings.

Interview Process

Since the sponsors, their team, and our group were not completely familiar with collecting appropriate touchpoint data from the youth for a database and an online platform, it was imperative to conduct multiple interviews with experts on the subject matter. Members of the WCAC gave us the contacts of other members of the Task Force and program participants. They also gave us suggestions to reach out to multiple organizations around the nation that at one point went through the same process. We found professional database companies through our own research online. Our team conducted interviews with professionals that deal with these subjects on a day to day basis to familiarize ourselves with the task at hand.

The following Interview Protocol Refinement (Castillo-Montoya, 2016) framework is made up of four phases that we followed to collect the most informative data that prepared our team to assist the WCAC.

1. Ensure interview questions align with research objectives
2. Construct an inquiry-based conversation
3. Receive feedback on interview protocols
4. Pilot the interview protocol

These phases were used to create our own interview protocol, found in appendix B, which was used to focus our group and the tone of the interview. We followed the IRB requirements in order to have a set guideline for each interview. We then created separate question sets for each type of person we interviewed. Questions asked to the Task Force members or database developers were different than the questions asked to the current WCAC members (see Appendices B-G).

Interview Participants

The list of members to interview grew as we advanced through the semester and met more professionals and people of the community whose opinions and knowledge were valuable to our team and sponsor's goal.

Table 1.0: Members that Participated in Interviews. Important Organizations and Roles of Each Participant. Table 1 provides a brief description of people we interviewed. This table should be referenced when reading our findings to give a brief overview of the people we interviewed.

Interview Participants

Participant	Organization	Date	Population
Participant 1	WPI Registrar	2/10/2020	Database User
Participant 2	Worcester Community Action Council	2/12/2020	Task Force
Participant 3	WPI Office of Lifetime Management	2/14/2020	Database User
Participant 4	WPI Office of Admissions	2/17/2020	Database User
Participant 5	Masshire Central Workforce Board	3/18/2020	Task Force
Participant 6	Worcester Public Schools	3/19/2020	Task Force
Participant 7	Pleasant Street Neighborhood Center Watch	4/1/2020	Task Force
Participant 8	Worcester Public Schools Transition	4/1/2020	Task Force
Participant 9	Worcester Chamber of Commerce	4/2/2020	Task Force
Participant 10	Worcester Division of Youth Opportunities	4/2/2020	Task Force
Participant 11	WCAC	4/6/2020	WCAC Youth Participant
Participant 12	CiviCore	4/9/2020	Database Developer
Participant 13	WCAC	4/10/2020	WCAC Youth Participant
Participant 14	WCAC	4/10/2020	WCAC Youth Participant
Participant 15	WCAC	4/13/2020	WCAC Youth Participant

Participant 16	Boys & Girls Club/ Youth Connect	4/20/2020	Director of Assessment
Participant 17	WCAC	4/29/2020	Human Resources Administrator
Participant 18	WCAC	4/30/2020	Grant Administrator
Participant 19	ABCD	5/1/2020	Director of Youth Services

A. WCAC and the Task Force

To fully understand what the WCAC and the Task Force needed, it was imperative to ask questions about their processes and what they believed was needed to be the most efficient with data collection. The question set can be found in appendix C. We found that there was a lack of data sharing between each organization involved with the WCAC job program. To start sharing data, we looked at each program's data touchpoints with the youth and compared them to other organizations. As this was done, it allowed us to develop a data collection map for the Task Force.

B. Database Users

Part of the process of the WCAC's data-collection begins with having a shared database. Therefore, it was beneficial to speak with professionals that also collect data using shared and accessible databases. We learned more about the different types of ways to maintain contact with large groups of people, and what data is important to collect from them. We also learned what would make alumni stay connected with the programs they graduated from. From there, possible suggestions were made to better engage graduates.

A familiar place for us to start, was in both the admissions and alumni relations offices at WPI. The question set that we used can be found in appendix D. The admissions office is the first touchpoint for collecting data. Here, the office learns about the student's background and their interests in the future. The alumni office oversees keeping in touch with alumni once they graduate from school and offered advice on how to engage people after graduation.

To get a better glimpse into what it is like to work with a tracking database, our team spoke with a member of one of the offices at WPI who uses a database to keep track of WPI students. Day to day, the registrar's office tracks student's course load and progress throughout their education. To understand the touchpoints that the WCAC needs, we spoke to them and learned about example touchpoints from a database like what we wanted to implement. Since there are so many different departments within WPI that share data, learning about their process of sharing gave our team valuable insights as to why data sharing is important and when it is necessary. We learned how a database is used on the backend, and what makes a frontend easy and simple to use.

C. Database Developers

Prior to developing a work plan, using appendix E, we wanted to learn more about database development, and more specifically, development of a tracking database. The WCAC wants to track the youth within the community, and what better way to learn more about this than with a developer of tracking databases. CiviCore & Child Services provide cloud-based client and case management solutions that make data collection, management, and analysis easy. By automating intake and accurately tracking timely demographic, activity, and performance information, CiviCore allows for nonprofits and government agencies to focus on addressing the whole needs of the children in the community, (https://www.civicore.com).

To understand more of what CiviCore does and how they could potentially help the WCAC, we interviewed members of their team. We wanted to understand more about their cloud-based solutions and the type of solutions they have produced in the past. By also interviewing members of their team, we learned more about the agencies that they have helped in the past and compared how their needs related to the needs of the WCAC. Overall, this gave us a better understanding of the database development process and we were able to use what we learned in the development of the WCAC workplan.

D. Other Community Action Councils

Before developing a whole new way of thinking for the WCAC, we needed to gain information on what other action councils have done to work towards solving gaps in data collection and data sharing. The question set we used can be fund in appendix F. For example, we conducted research on the ABCD, Action for Boston Community Development. They have taken steps to develop a tracking database and online platform to do the same things the WCAC is looking to do now. This gave us insight into another non-profit organizations within the same state that has gone through similar advancements.

E. WCAC Participants

Youths who participate in these job programs, past and present, will be the ones interacting with the online platform. Therefore, it was important to hear their opinions and thoughts about a transition from paper interactions to online ones. Participants 9 –13 were asked questions from appendix G and able to give insight as to what it is like working with the Task Force and could tell us what programs worked for them and which aspects of the database and platform they would potentially want to see and use.

3.6 Data Analysis

After the interviews were concluded, we were able to break down each interview and analyze them to develop our findings. See appendix H for interview information summary. We took our raw data and interviews and identified and sorted different opinions and needs of each participant we interviewed. We compared and synthesized each of our conversations to truly understand the overarching need of each organization that can be beneficial to the WCAC and Task Force as a whole. From these steps, we discovered our findings that include the necessary steps going forward to guide the WCAC through the implementation of a database given the data we were given from the mentioned interviews. The findings also discuss the data map that was created after a careful examination of the multiple intake forms, we were able to gather from the Worcester Youth Task Force.

Chapter 4: Findings

The findings in this section are based on our extensive research and interviews with the WCAC and Task Force, database users, database developers, other community action councils, and WCAC participants. Through our interviews we collected data touch points from different organizations, information about whether a database would be useful and accessible, and what types of databases would work for what the WCAC requires. Conducting these interviews also allowed us to understand how the organizations within the Task Force work separately and with one another, if youth members would be interested in using an online platform and to see what actions have been done in the past with other action councils and non-profits. These findings helped us to develop a work plan for the WCAC to move forward with database implementation.

4.1 Communication with the Youth

When interviewing members of the Task Force, an issue that consistently came up was miscommunication with youth members within the program. Specifically, Participants 5, 7, 9 and 10 all expressed that the biggest challenge within their program was miscommunication with the youth. This was largely because communication was limited to face-to-face interaction and phone calls. Participant 5 stated that communicating with the youth was both time consuming and difficult. Participant 5 also stated it was difficult getting into contact with youth members in the first place. With these findings, it is obvious that youth interaction and progress tracking was an inefficient process within the Task Force.

What we found out before we did research on databases and online platforms was, firstly, whether youths involved within WCAC programs had accessibility to such online platform and secondly, if it would benefit and or be useful to them. If the youths were not willing to participate online, such efforts from the WCAC would be ineffective. After conducting several interviews with youth and alumni members from the WCAC, we discovered that youth participants would not only be willing to use an online platform but also expressed that it would be more convenient than the current methods of communication such as phone calls and face to face interaction. One concern we had before starting this project was that not all youth members would be able to access an online platform. Through conversations with multiple youth members (Participants 11 and 13-15), we determined that an online platform would be easily accessible to members within the program. With the interviews we conducted, no members stated they would not be able to access an online platform. In many cases, we learned applications and other forms would be more "convenient" to be online instead of youth members having to physically go into an office to hand forms in. The participants also stated that an online platform would be both "useful" and "easy." With an accessible online platform that is easy to use for youth members, the task force can contact its youth through this platform while also having the ability to track their progress data.

When prompted to talk about viewable job postings, most of the participants believed that it would help them to see if the jobs they were interested in, were accepting applications and looking for more workers. Participant 11 said "it would be a nice to be aware of available jobs and would be a good first step to working with (industry/company) and the job program." With communication for job/internship openings, the WCAC and the Task Force would inherently develop an understanding of what youths are interested in when it comes to finding a place to work which in turn will allow them to tailor their programs to the interests of the youth.

4.2 The Data Collection touchpoints of the WCAC

Outreach Stage

The first data collection touchpoint for the WCAC is through outreach of their Job and Education Center (JEC) and how they attract Youth to the different programs within the JEC. Within the outreach stage of data collection there are multiple methods in which a youth can become connected with the WCAC. The first method of outreach is through the most common form of communication which is word of mouth, whether this is friends, relatives or the JEC alumni network. This is a specific datapoint in the WCAC's collection because they can track the number of youth participants who are joining the WCAC through word of mouth communication. The next form of outreach is mandated, whether through the Department of Transitional Services or the Court. It was found through conversations with members of the WCAC, that many youths connect with the JEC through DTA and court mandates.

Along with word of mouth and mandated outreach, is outreach in the form of walk-ins. Youth and adults walk in the WCAC looking for help with jobs, housing or general info in which they learn about the different programs that take place within the WCAC. Similarly, youths and adults can apply online through the WCAC website. However, given the different types of outreach methods the WCAC has, there is no data collection on the percentages of youths coming from each one. Furthermore, the WCAC does not collect the rates of success and failure of the youth given the form of outreach they used to connect with their programs. This numerical data collection process is used by organizations within the taskforce such as Youth Connect (https://www.wcac.net/youthworks-summer-jobs/) who has successfully developed a reporting system where they can track different statistics of their youth. Youth Connect run year-round and summer employment programs for youth members, and their method of tracking can be utilized throughout the WCAC. This type of numerical data collection could benefit the program effectiveness by providing the entire task force with tangible data of youth progress through training and job attainment.

Enrollment Stage

The next data collection touchpoint for the WCAC is the enrollment of youth members within their Job and Education Center. This starts with a one-on-one individual assessment of each candidate to determine whether they are eligible to take either the HiSet, a high school equivalency test, or to attain a job through the YouthWorks program. If they are determined to be ready for the HiSet then they are placed in either the Wings or Project Excel Programs, which are JEC programs that provide readiness training for the test. If they test too low for enrollment within Project Exel or Wings then they are referred to a partner agency for continued assessment. If the youth members are determined eligible for YouthWorks by meeting the standards for program entry, they are placed into the program and subsequently placed into a working role. Standards of entry include being a Worcester resident, being of correct age, and meeting low-income or high-risk criteria. If they are deemed ineligible for entry into YouthWorks, they are referred to other staffing agencies. However, it was found that within the enrollment process, the youths are not asked what, if any Task Force organizations they have been a part of before enrolling into the JEC.

Given this process of enrolling youths into the JEC, there is also no numerical data collection on what percentage of youths are determined eligible for HiSet or YouthWorks. Relating back to the outreach stage, if the WCAC collected numerical data, they may be able to track the percentages of what the outreach method was of those percentages, who was eligible for HiSet or YouthWorks, and who was deemed ineligible. This data collection process in turn would give the WCAC a better understanding of where the youths are coming from and how they are being assessed once they are enrolled.

Program Participation Stage

The next data collection touchpoint for the WCAC is the program participation of the youth members involved in the program. Once youth members are placed into their specific project or program, they are given an Individual Service Plan with goals for their progress going forward. They are also given an initial orientation from their program advisors on what their expectations for participation and involvement will be. From there, youth members are provided training on job readiness and financial capability and receive online certificates when certain modules of training are completed. They are given coaching through their training as well as Case Management for any issues they may encounter. Through their training, they are continually assessed by their advisors to see if they are fit for program integration, which includes assurance that youth members are continually participating and making efforts to improve. Once pre-employment training is completed, they are given job placement assistance by the WCAC. However, it was found that there are no programs within the WCAC that involve the youth with creating a profile on LinkedIn. This is a crucial step in developing a youth's work readiness and allows them to connect with employers and job opportunities throughout the Worcester area. This type of work readiness training could easily be tracked, as there are many different steps in creating a profile for a professional networking website. Also, if the Youth are trained on how to update their LinkedIn profiles, the WCAC can more easily track their ongoing job-related information.

Outcome or Achievement Stage

The final data collection touchpoint of the WCAC is outcome or achievement. There are various achievements that are considered within the JEC; however, these outcomes are not tracked by the WCAC. These various outcomes include passing your HiSet test, subsidized work experience, work readiness which includes a certificate portfolio and financial capability. Considered achievements can include full time employment, a start towards a higher education degree, and improved social and emotional skills among youth members.

After finding WCAC's data touchpoints, we also wanted to compare this to other organizations within the Task Force. We found that although these were the right personal milestones to track for each youth, there were several analytical measures that were not tracked compared to that of Youth Connect. We found that Youth Connect records the number of youths who receive a job relevant license, the percentage of individuals who gain employment, the number of individuals completing a financial education program, the number of families who have received job readiness training and the number of youth who engaged in developmental service learning programs. All these tools will enable the WCAC to track the progress of the youths in terms of a whole, which in turn develops an understanding of program effectiveness.

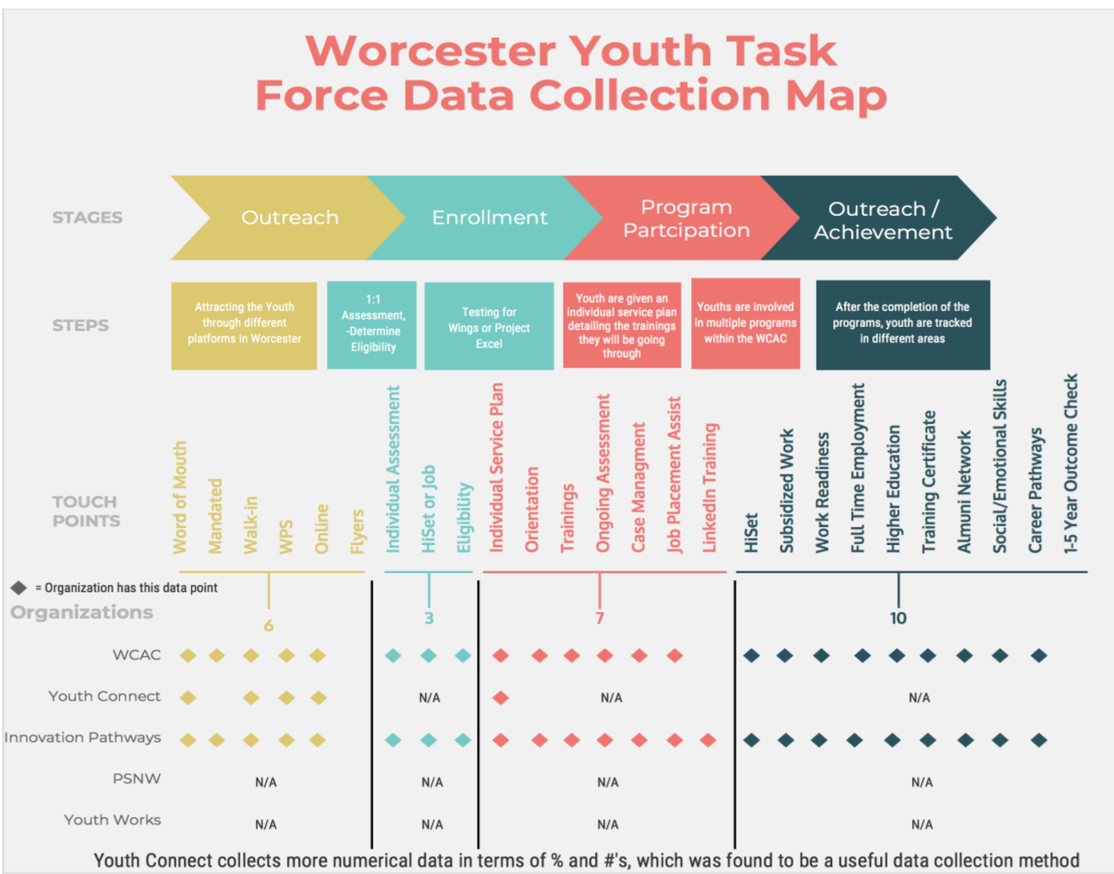
Coinciding with this finding is the desire for the WCAC to track youths once they have graduated from a program within the JEC. The WCAC and other organizations with the Task Force want to be able to track youth five years out their programs, however there is no data collection tool in place that would enable this. It was recommended by Participant 3 that along with an online database, the WCAC should develop an alumni program like that of LinkedIn that connects youths back with the WCAC and other alumni of the WCAC. This would allow the

WCAC to track where the youths have had jobs and if they are currently holding jobs, 5 years out of the program.

4.3 Database Development and Management

The main goal for this database is to see outcome and progress reports of the youth while they hit key milestones and after they leave the program. The main milestones for the youth include outreach, enrollment, program participation, and outcome for achievement. A detailed data map highlights major milestones and the sub steps that are involved within the youth's process of the WCAC and other organizations which is shown in Figure 1.

Figure 1. A Map of Milestones Youth Hit Throughout Their Experience in the WCAC and Task Force Programs



This type of information would be kept in a youth's file/profile. From our conversations with our sponsor and the members of the Task Force, a database would have to be "data restrictive, ” meaning that people looking at the data would need to have different access to different types of private information. This type of information in a shared database, according to participant 12 and other database capabilities, can be protected by permitting access to different members in the task force using passwords granting them access. Youths that participate in these programs generally come from economically disadvantaged backgrounds which we mentioned earlier in our research. Many intake forms from organizations involved in the Task Force collect the same general information, however, some have more specific data such as medical, school, and court information. Therefore, the ability to grant different levels of access to private data would be a significant feature for this database to be successful.

Talking with participants 1, 3, 4, 7 and 8 allowed us to understand that there are databases that allow organizations to do just that. Databases like Salesforce or Workday are less specific to the needs of the WCAC but can be slightly adjusted to make do. Companies such as CiviCore or project teams at WPI, for example, can build a database from the ground up working side by side with the WCAC to ensure that all their needs are met.

Our interview with a developer from CiviCore informed us that the company developed databases for more than 500 non-profits around the country, including, Big Brother Big Sister, United Way, Planned Parenthood, and many more. Similar databases had been created to what the WCAC is looking for. They can set everything up including intake forms with client information, demographic information, gender, ethnicity, age, electronic signatures, release forms, medical info, user permission and many other features that would be useful to the WCAC. They’ve made databases in the past that can track attendance and attendance for workshops, store documents, create outcome reports, keep track of graduation rates, job placement after graduation and how youth are doing five years out, income and wage history, breaks in employment, and how long it takes to get a job.

We found that a professional database developer could meet the needs of the WCAC. Such database needs to allow program coordinators to analyze data, see outcome reports, and offer an online platform for youths to create their own profile to update their general information and interests and see potential job listings. Through our conversations with participant 7, we developed our own price model from the rough numbers that were given, shown in the Table 2 below.

Table 2.0: CiviCore Pricing Model. A glimpse of what cost would look like if WCAC were to develop a database with a professional company.

Development	Time	Cost ($)
Initial Fee (building)	3-4 Months	8,000 to 9,000
Unlimited App Support (necessary)	Monthly	350
Training	Once or Requested	150
Minor Changes (names, map, calendar)	Needed	0
First Year Upfront Fees (total)		11,000 – 14,000

They do not charge by user so there is no additional cost when adding more members to the database. Therefore, the database can grow with the organization. Once the database is developed and backend members are trained the only cost that the WCAC would continue to pay is the App Support. This support is for all tablets, computers and smartphones, and is required monthly. Doing this allows professional companies to analyze the data, and produce reports, while directors within the WCAC can read the reports and spend time changing their programs rather than being focused on data entry and analyzing. Although these features seem necessary, it may be too expensive for the WCAC to afford and we are unsure of how much the city of Worcester would grant the organization to move forward with this project.

After our conversation with the WCAC Grant Administrator (Participant 18) it was found that the upfront costs of CiviCore are attainable through grants. WCAC has worked closely with the Greater Worcester Community Foundation in the past and have had success getting funding for various programs. With that said, it was found that many funders will look at the outcome of the grant process before accepting the grant application. This means that the outside funder would look to the number of individuals that would be helped with the grant and decide based of off that. For example, with a grant of $10,000 the funder would expect a high number of individuals to be helped given such a large donation. As for the database implementation, the number of individuals that would be impacted is always increasing with new members joining the WCAC every month. However, when looking into the monthly fee of CiviCore, there would need to be additional research into what funders would accept and a yearly grant. The timetable of a grant depends on the funder used, however, on average an application can be received and accepted between 2-3 months, with large grants taking a bit longer.

Furthermore, from our background research, we learned that WPI students within the computer science or data science major would be able to create a database if the needs of the WCAC were laid out for them as a part of their Major Qualifying Project (MQP).

4.4 Scalability across the Task Force Organizations

We spoke with the multiple members of the Task Force to get an understanding of how all the organizations work together as one, to benefit the youth. We learned about their database systems and about the need for sharing the data that they collect. More specifically, we learned about the data each organization collects, how this data is collected and most importantly if the data is shared with other organizations within the Task Force.

Table 3.0: Key Findings from Task Force Members. As seen in the table below, organizations within the Task Force each face their own challenges of collecting and sharing data.

P	Organization	Data Collected	Database Used	Challenge	Need
2	WCAC	Intake forms, minimal tracking information	None	Inefficient information tracking Duplication	Progress tracking and engagement
5	Masshire Central Workforce Board	General, Demographics, Barriers	CommonCore	Duplication	Shared System
6	Worcester Public Schools (WPS)	General, School Records	Google Classroom Skills Library	Duplication, Communicatio n between Orgs.	Regular Sharing
7	Pleasant Street Neighborhood Center Watch	None	None	Communicatio n with Youth	More youth engagement
8	Worcester Public Schools Transitions	None	None	What Data to Collect	Collect
9	Worcester Chamber of Commerce	None	None	Communicatio n with Youth	More youth engagement
10	Worcester Division of Youth Opportunities	Surveys/Pre-Surveys Daily updates Social Skills	Tracking Indicators	Getting Shared Information from WPS	Family Contact (Share)

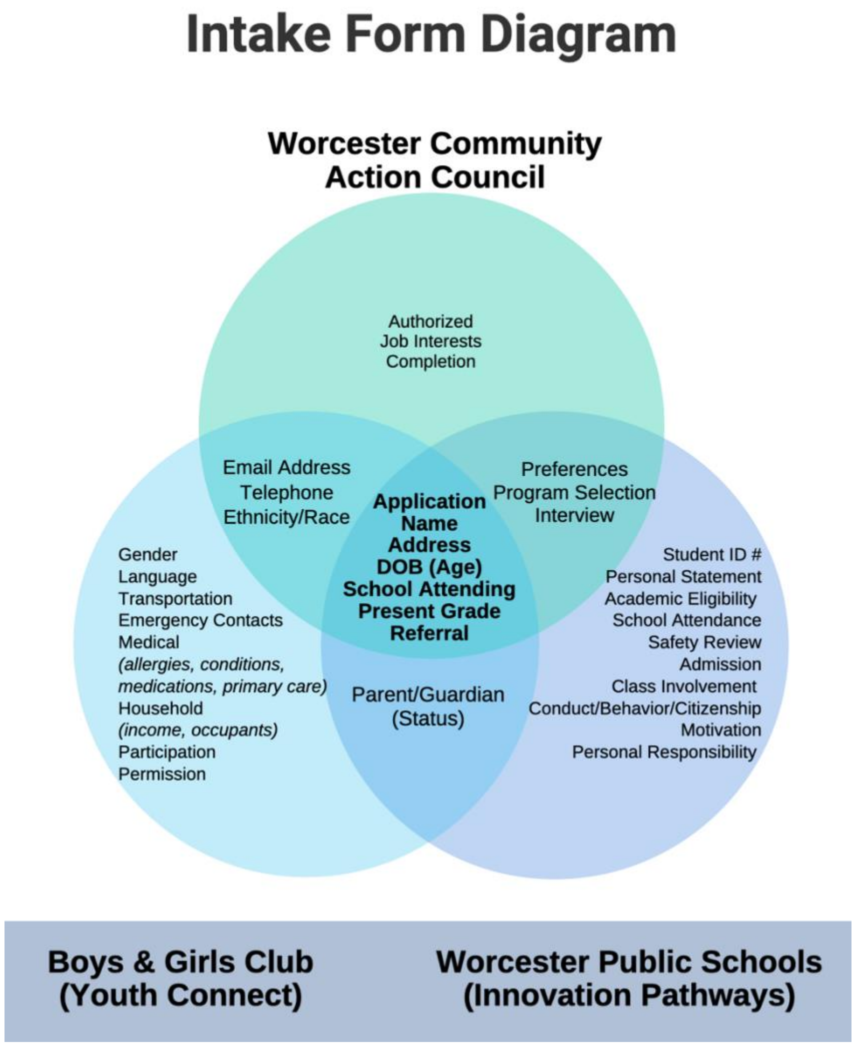
As seen above, common challenges among these organizations are miscommunication with the youth and the lack of sharing of information among the organizations. Most of this miscommunication occurs because data is updated and shared through paperwork. This paperwork is thought of as “outdated”, and due to this, contact information may not always be up to date. Because of this outdated style of collecting/sharing information with one another, several Task Force members say it is hard to establish a constant communication with youths that are involved in programs.

As seen in table 3 some are unaware of the exact information that they need to collect in order to track their youths through their program. Participants 7, 8, and 9 do not collect data from the youth because they either do not think it is necessary, do not know exactly which data to collect, or they do not have a database to keep track of this information. Participant 6 from Worcester Division of Youth Opportunities collects data from surveys but needs to collect more data about family contact information. Participant 6 believes the best way of doing this is by allowing WPS to share family information. The biggest challenges for organizations 2, 5, and 6 were making sure data was not being duplicated or entered in twice by different organizations. Another challenge is that some organizations use multiple databases already.

However, after learning about most of the Task Force organizations, our focus was primarily narrowed to the WCAC. Therefore, for our project we set out to create a work plan for WCAC. Keeping this in mind, we came to understand through our research and interviews, that the database the WCAC chooses to move forward with needs to be scalable across all organizations of the Task Force. As the WCAC grows, the database must be able to grow alongside them. This way, as more members join their programs and other organizations see the success of their database, they can easily adapt, and the database can be expanded in order to support everyone. What is most important during the scaling of this database is to ensure general information, such as youth contact information and program enrollment, is shared and does not have to be duplicated.

Throughout our interviews with the Task Force, we also inquired about the intake forms that are used in the enrollment process of the youth with each organization. The intake forms that we collected provided insight to the information that is collected by each organization that responded with a copy of their own. We found that the information collected throughout the Task Force does vary, however, there is general data that is coherently the same from organization to organization. This data is included in the intake form diagram shown in Figure 2.

Figure 2. Intake Form Diagram based with WCAC Google Form



The Venn diagram shows the general information that each organization needs from the youth involved when they fill out their intake form. In the very middle, the words in bold, show the similarities that all the organizations share. This is general information. The WCAC collects the least amount of specific information, as shown above. The Boys & Girls Club, who runs the Youth Connect program, and the Worcester Public Schools (WPS), who run Innovation Pathways, both collect more information from their participants. The intake form from WPS/Innovation Pathways is more related to school activities, but the Youth Connect/Boys and

Girls Club of Worcester collects more essential information that could be useful for them. The only program specific information the WCAC collects is their whether they are authorized to work, what jobs their interested in and how the application was completed. The WCAC does not ask for information about gender, language, ways of transportation, parent/guardian information, or emergency contacts. Medical information and household income are not important for what the WCAC is trying to accomplish, therefore, information like that can be left out on their intake forms. All this information could be useful for them to add to their intake form.

Chapter 5: Recommendations

Based on our findings, we were able to develop six different recommendations regarding the implementation of a database for the Worcester Community Action Council. The first recommendation is to include outreach information in the WCAC's intake forms. Second would be to share information of youth program enrollment across the task force. Third, we recommend that the WCAC set up workshops where the youth learn to create and use LinkedIn. Fourth, we recommended to add one-year check-ins on both youth and program alumni. Our fifth recommendation would be to outsource database construction to a professional developer. Lastly, we recommended the WCAC develop their database with the help of a WPI student project team.

5.1 Include Outreach Steps in Intake Form

As seen in the Figure 2, the WCAC's intake form does not include any information about where the youth is coming from. According to figure 2, the WCAC collects the least amount of information from their intake form when compared to the two other Task Force organizations. Adding information about gender, language, ways of transportation, parent/guardian information and emergency contacts may be information that can be beneficial to the Job and Education program. An important piece of this database is tracking where each of the youth are coming from, however, nothing on their intake form asks for this information. There are many ways that youth can enter the WCAC's programs. Whether youth hear from word of mouth, are mandated by the court or DTA, walk in, come from Worcester Public Schools, see on the internet, come from the Fuel Assistance Program or the Family Resource Center this information needs to be recorded.

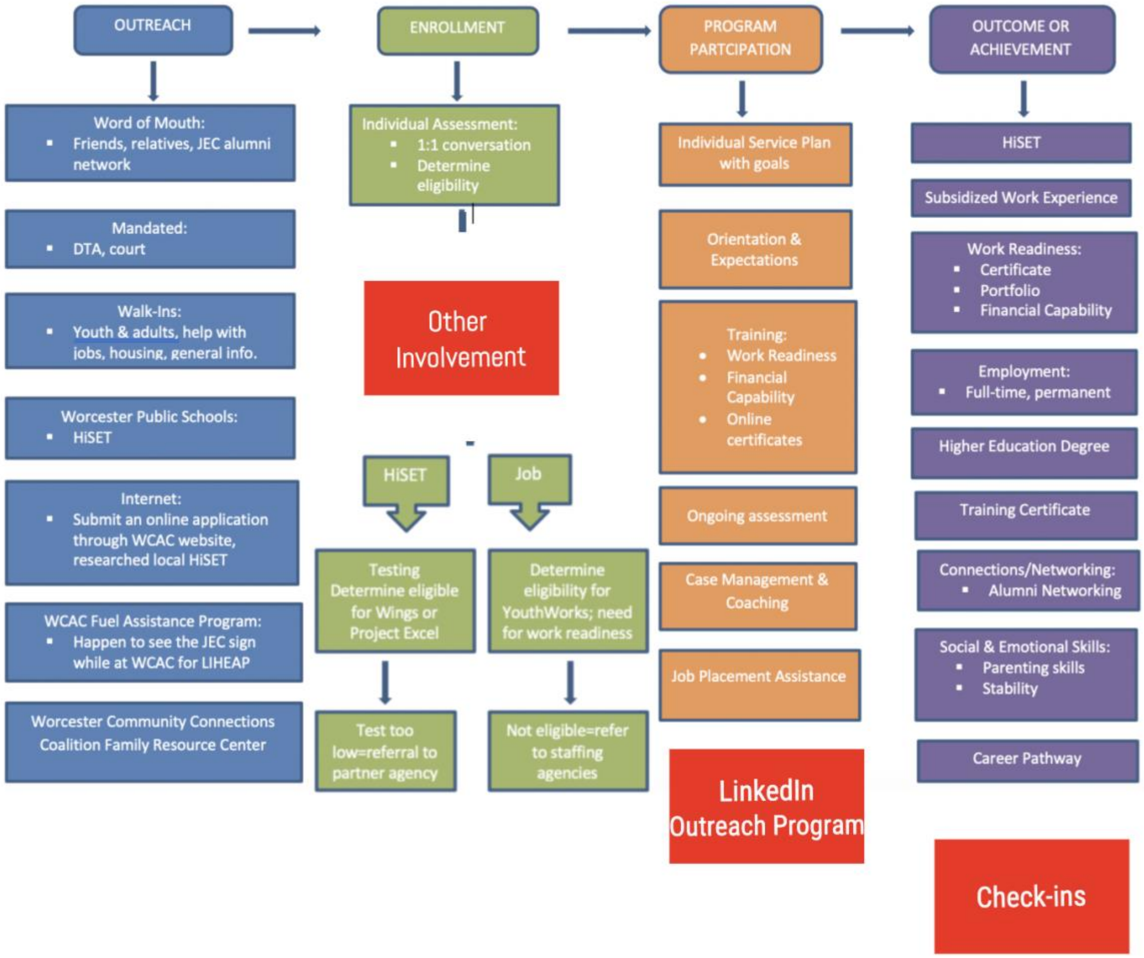
On the intake form, it would be beneficial to add a question asking where/why they made first contact with the WCAC. This way the youth's file and the WCAC would have information about where they are coming from. This early stage of collecting data is the very first step in tracking the youth's full journey. Background information will allow complete tracking from start to finish.

5.2 Add "Other Involvement" in Enrollment Phase

One commonality that was found while interviewing the Task Force members was the fact that information on program participants was often duplicated. Different organizations have different ways of recording data and keeping files on things whether that is putting things into a separate database or keeping papers on file. From multiple conversations with the Task Force, there are many youths that are involved in multiple organizations and with the lack of a form of communication between the organizations, there are often duplicate intake forms and files on youths involved in different programs. During the one on one conversation in the enrollment stage, other organization involvement should be discussed and recorded.

By including a section in the database that includes all programs youth members are involved with during the enrollment phase, it can allow the task force to streamline the process of creating intake forms and collecting data on youth members in various programs. When duplication of intake forms and data are eliminated, information can be shared easily and without confusion because there are no unnecessary files or data. Figure 3 highlights the added red rectangles which are additional steps in the youth's journey that would help keep track of program involvement, and to create a WCAC network.

Figure 3. Added Steps in the Youth's Journey.



5.3 Add Participate in LinkedIn/Alumni Outreach Program

Within the youth's journey in program participation there should be a program to set up members involved with a sort of alumni reach program. There are free apps like LinkedIn that would allow all members to stay connected during and after program participation. Therefore, within the participation part of the Youth's Journey there should be a workshop where the youth can set up LinkedIn accounts where they can keep in contact with case managers, bosses, co-workers, and friends they met during their experience.

Referring to figure 3, adding this step in their journey will also allow the managers of the program to collect email addresses and best forms of communication with the youth who will graduate and become program alumni. This will allow members and participants of the WCAC to communicate with one another once they move on.

5.4 Add 1-5 Year Outcome Check In

A database can be built to support these needs by giving members personal profiles to stay in contact with one another during the length of the program and for the future. The database developers, specifically CiviCore, can schedule automatic emails and notifications to send out to participants looking for responses that the WCAC is looking for. Within these emails they can send out surveys looking for answers to better their existing programs.

If the WCAC were to add check ins with participants, the youth's journey never really ends. The WCAC can send emails, as often as they would like, in order to understand where their graduates are, years out after the program ends for them. By adding these check-ins to the Outcome/Achievement part of their journey, refer to figure 3, it will allow the WCAC to collect more data about how their programs have affected the youth's lives.

5.5 Hire a database developer to create a tracking database.

Based on our research, we recommend three database development companies for creating this youth tracking database for WCAC. The chart explains the positives and negatives of each database developer along with the cost of their work, and other organizations they have worked with in the past. The database developer will be able to use the research of this projectto better understand the needs of the WCAC and the Worcester Youth Task Force. The database developer details are shown in Table 4.

Table 4.0: Database Developers

	Pros	Cons	Cost ($) Upfront/Yearly	Previously Worked With
CiviCore https://www.civicore.com/	- Customizable - Timely - Mass email - Granting Permission - Data Analytics - Mobile - Expandable	- Price	- $11,000 to $14,000 up front - $350 a month afterward	- Planned Parent Hood - City of Denver - Big Brothers, Big Sisters - United Way
Neon CRM https://www.neoncrm.com/	- Email Marketing - Easy Reporting - Constituent Login portal	- Not Customizable - Online Platform -Restrictive - Support	- Start at $149 a month	- Lawrence Humane Society - Community Food Bank -YWCA Cambridge
Salesforce https://www.salesforce.com/	- Expandable - Accessible - Email Marketing - Data Collecting	- Need an analytic team - Expansion Price	- 10 free licenses - $72 user/month	- 47,000 non-profits

A key component of this process is to first implement the tracking database for only the WCAC. This will allow the database developers to focus the groundwork of the database on solely the WCAC and will allow them to work and become familiar with the database in the early stages. After the early stages of the new tracking database, the database developers and the WCAC will have had time to work out any minor issues with the application. The following stage will then allow for the database to expand into other organizations within the Task Force.

There are significant merits and demerits within this recommendation. Important merits worth mentioning are that the WCAC would be receiving high quality service that has potential to significantly improve its data sharing and collecting within the task force. Since the platform would be developed by an outside party, the WCAC can continue to spend its time and energy on its programs, rather than take away part of those resources on constructing a database.

Also, some companies would analyze the data, and send reports on what they are seeing rather than the WCAC making these reports. One specific database that has worked with hundreds of non-profits around the country is CiviCore. Most of the company's growth and success is through these non-profits who not only need to collect the right data, but also analyze it. This company comes at a high yearly price, however, the price of expansion and adding more users does not cost anything. Therefore, as the WCAC would like to expand their database into the Task Force there would be no additional cost per user.

Salesforce, as you can see in Table 4.0, first would give out 10 free licenses, and then for each additional user they would charge 72 dollars a month. Therefore, the bigger the database gets the larger cost the WCAC would have to endure. On top of this, it is likely the WCAC would have to hire an analyst to manage the software and oversee operations and data income and output. Although they are trusted by thousands of non-profits, their fee can get very expensive if more and more users are added to the database.

A major challenge in this recommendation is pricing. Since the WCAC has a finite amount of funding and resources, it at first, does not seem feasible to outsource this database construction. However, after talking with Participant 18, the Grant Administrator at WCAC, it seems that the organization has many strong connections with various foundations that can be contacted for funding. There are many foundations within the Worcester community that have donated up to 50,000 dollars in the past, specifically for youth programs and the Grant Administer said that the pricing model we gave seemed "attainable" as youths and employment are important topics. A database that collects and organizes information will in fact help the WCAC in the future to apply for more grants because their data is easily available. Investing in professional developer is investing in the future. A way for the WCAC to manage this could be to consider its most affordable options while temporarily prioritizing it within its budget.

5.6 WPI and WCAC work together to develop a database through WPI's MQP Program.

The next recommendation is to continue to use Worcester Polytechnic Institute's project-based learning to develop a database and online platform to fit the needs of the WCAC. Based on our findings, we realized that cost was a significant factor in moving forward with developing a database that would work not only for the WCAC but eventually all the organizations involved in the Task Force.

The WPI campus is located right down the street from the Job & Education Center and has students in majors such as computer science and data science that would know how to create a database side by side with the WCAC. The partnership that has already been developed over the course of this current project can be expanded into next year's MQP. Students at WPI are constantly looking for projects in their senior year. Major-specific students would have the ability to mold a database to the needs of the WCAC. The students would have 3, seven-week terms to use our findings and recommendations stated in this paper and then develop a useful project for the WCAC and complete a successful project in order to graduate from their programs.

If this option were chosen, the WCAC would have to act quickly because current juniors are already in the process of looking for their senior year Major Qualifying Project (MQP). The faster the project application is completed the faster students would be able to do background research about what is needed for this project and the faster they create a relationship with the WCAC.

The merits and demerits of this recommendation goes somewhat in the opposite direction of the previous one. The strongest merit this option has is affordability. Since the MQP is a student based academic project, the WCAC would have access to highly skilled students at no expense. Another merit is continuity, as a work plan for developing and implementing a database has already been put in place.

There are two significant demerits with this recommendation. First, student database developers likely do not have access to the same resources or have the same level of experience as professional database developers. This could potentially equate to an online platform that does not function at the same quality as one put together by a professional organization. Another potential demerit could be lack of time, as students would only have a maximum of one school year to implement the plan and put a database together. Also, once those students graduate, there will be a need for a constant support team that could continue the database's growth and solve potential issues.

The WCAC can manage these disadvantages by providing WPI MQP advisors with all needed information before the start of the academic year, and by researching successful databases used by other community action councils so they have a clear understanding of what is needed. In order to go this route, our project team and the WCAC would have to present our findings to the head of either the Data Science or Computer Science department at WPI. Then professors would think about the project feasibility and how it could benefit both the WCAC and the students in their department.

Chapter 6: Deliverables

The outcomes of this project include the detailed workplan and infographics that highlight the necessary steps to move forward with implementation of a tracking database and online platform for the WCAC. These infographics include the database developers that were able to meet the needs of the WCAC, along with the option of using a WPI student project team instead. The infographics also include the data map that was created from the analysis of the intake forms that were collected through the Worcester Youth Task Force, and highlight the areas of data collection that are similar with one another but also unique to each organization.

When we first started this project, the WCAC had a broad idea of the database that they needed. From the information that they gave us and the interviews and research we conducted we narrowed the project scope and developed a road map for developing a database in the future. The goal of this work plan is for us to make the path of developing a database clear, in order to make it successful. We truly hope that our research has laid the groundwork for the future of this tracking database and online platform.

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Appendix

Appendix A: IRB Sample Consent Form

We are asking you to participate in a research study titled "Identifying a Work Plan for Creating a Database and Online Platform for Youth Job Opportunities in Worcester". We will describe this study to you and answer any of your questions. This study is being led by Ethan Harrell, Garrett Stephenson, Reid Walker, and Dakota Wheeler, Management Engineering students at WPI. The Faculty Advisors for this study are Prof Sarah Strauss, Anthropologist at WPI, and Prof Purvi Shah, Marketing Specialist at WPI.

What the study is about

The purpose of this research is to create a work plan for implementing a database and online platform for youth job opportunities in Worcester. The WCAC and the Task Force believe that a youth-tracking database and a youth job website are two of the best ways to address the current problem of unemployment of youths in the Worcester area.

What we will ask you to do

We will ask you to answer questions. In this specific study, our method of collecting data is by interviewing. You will be asked to answer personal questions with answers specific to your own experiences as well as general questions.

Risks and discomforts

There are a few risks that we anticipate could occur during the study:

- There is a risk that you may feel uncomfortable with sharing certain personal information/experiences
- There is a risk you may feel anxious or pressured to answer questions

Benefits

This research will help the WCAC in their efforts to improve youth employment in Worcester. We expect this research will lead to making the WCAC's processes and programs more efficient, which will lead to an easier and smoother process for the youth who are currently part of the program and for alumni.

Compensation for participation

Participants will not receive any compensation.

Audio/Video Recording

We will audio record the interview to ensure that we do not miss any information gained during the interview. The audio recordings will not be shared publicly, will only be used within this study, and will be archived after transcription.

Please sign below if you are willing to have this interview audio recorded. You may still participate in this study if you are not willing to have the interview recorded.

i. I do not want to have this interview recorded.
ii. I am willing to have this interview recorded.

Signed:

Date:

Privacy/Confidentiality/Data Security

None of the research data we receive will be made public. That data will be protected and private.

We plan on keeping identifying information with the data collected. Surveys, however, will be de-identified as they will be anonymous. The only people who will have access to the data and identifying information will be the WCAC and its partners. Please note that email communication is neither private nor secure. Though we are taking precautions to protect your privacy, you should be aware that information sent through e-mail could be read by a third party. Data may exist on backups and server logs beyond the timeframe of this research project. Your confidentiality will be kept to the degree permitted by the technology being used. We cannot guarantee against interception of data sent via the internet by third parties.

Sharing De-identified Data Collected in this Research

De-identified data from this study may be shared with the research community at large to advance future research. We will remove or code any personal information that could identify you before files are shared with other researchers to ensure that, by current scientific standards and known methods, no one will be able to identify you from the information we share. Despite these measures, we cannot guarantee anonymity of your personal data.

Future use of Identifiable Data or Specimens Collected in this Research

Identifiable information will not be used for future research with obtaining your consent.

Taking part is voluntary

Your involvement in this research is voluntary, you may refuse to participate before the study begins, discontinue at any time, or skip any questions/procedures that may make you feel uncomfortable, with no penalty or consequences.

Follow up studies

We may contact you again to request your participation in a follow up study. As always, your participation will be voluntary, and we will ask for your explicit consent to participate in any of the follow up studies.

May we contact you again to request your participation in a follow up study? Yes/No

If you have questions

Please ask any questions you have now. If you have questions later, you may contact our team at gr-WCA@wpi.edu. If you have any questions or concerns regarding your rights as a subject in this study, you may contact the Institutional Review Board (IRB) for Human Participants at 607-255-5138 or access their website at http://www.irb.cornell.edu.

Statement of Consent

I have read the above information and have received answers to any questions I asked. I consent to take part in the study.

Your Signature____Date

Your Name (printed)

Appendix B: Interview Protocol Template

Name of Interviewer(s): ________________________________

Location: ___________________________ Date: ___________ Length: ___________

Name of Interviewee: ___________________ Age: _______

Introduction

Hello, my name is __________________ and I will be facilitating this focus group interview along with my colleague(s) ____________________________ . The purpose of this research is to create a work plan for implementing a database and online platform for youth job opportunities in Worcester. We are working directly with the WCAC and its associates to help improve the youth employment programs for current and future participants. The answers you provide will only be used for the previously stated purpose and will be kept private.

Prior to this interview you were sent a consent form to read, print, and sign. If you did not want to sign the consent form and/or you could not print it out, please indicate so now. If there are no further questions, let's get started with the first interview question.

Insert Question Set

Closing Remarks

That is all the questions we have. We very much appreciate you taking the time to answer our questions and we wish you the best of luck. If you have any questions or concerns later, you may contact our team at gr-WCA@wpi.edu

Appendix C: Worcester Youth Task Force Question Set

Q.1 Please tell us something about yourself.

- What organization you work for?
- What is the goal of the organization?
- What is your role within the organization?

Q. 2 Tell us about your data collection process related to youth programs and tracking.

- When do you collect data from the youth?
- How many youths are involved in your specific program?
- How often do you and the youth contact one another?

Q. 3 How does your organization interact with the WCAC and the other Task Force organizations?

- What are your ways of communication?
- Do you share or receive any of the data you collect with any other organizations?
- Are there any improvements you would like to see with this communication?

Q. 4 What are the challenges you and your organization face when it comes to data collection and sharing?

- Miscommunication with the youth (I.e. difficulty contacting)

Q. 5 How would an online tracking database help you regarding data collection and the challenges you mentioned above, among the youths in the Worcester community?

- Has your organization worked with a tracking database before?

Q. 6 What improvements would you like to see made within the Task Force in terms of data collection?

Q.7 How would a single shared data base amongst the WCAC and Task Force help you?

Q.8 Do you have any questions for us?

- Is there anything that you believed that we did not touch upon that you think will be important?

Appendix D: Database Users Question Set

Q.1 Please tell us something about yourself.

- What organization do you work for?
- What is the goal of the organization?
- What is your role within the organization?

Q.2 What data do you collect? (Specify towards what user we are speaking with)

Q.3 Can you tell us about your data collection?

- What are the touchpoints on our data map?
    - When are you receiving data?
- What are the touchpoints on our data map?
- How often is this data being collected?

Q.4 What systems do you use to collect data

- Do you use different types of data collection?

Q.5 Do you share this data with other organizations/offices/departments?

- If so, how do you do this, and how often
- If not, do you think it would be beneficial to share data

Q.6 What aspects of your data collection and sharing really work for you?

Q.7 Are there aspects of your data collection and sharing that you would like to see be improved upon?

- If no, could you give us some more examples of reasons why your system works so well

Q.8 From our brief conversation about our project, do you have any suggestions that would work for them?

Q.9 That concludes our interview, do you have any questions for us on some things that we may have missed?

Appendix E: Database Developers Question Set

Q.1 Please tell us something about yourself.

- What organization do you work for?
- What is the goal of the organization?
- What is your role within the organization?

Q.2 What type of database do you use when working with clients?

- Do the types of databases differ from one client to the next?
- Can you explain more about the cloud-based solutions that you develop?

Q.3 What are characteristics of an effective tracking database for youth?

Q.4 What are the biggest challenges the organization faces when developing a plan for a database management system for a new client

- What would the biggest challenge be with a youth tracking database?

Q.5 What is the cost associated with your solutions?

- Annual? Monthly? Is there a one-time development fee?

Q.6 When working with the youth there are obviously security measures that need to be met, how safe and secure are the cloud-based solutions you offer?

Q.7 Can you give us some examples of organizations that use your database?

Q.8 Are there any aspects of developing a database and its uses that you think are important for us to know from our brief discussion about what our project is?

Appendix F: Other Community Action Councils Question Set

Q.1 Please tell us something about yourself.

- What organization do you work for?
- What is the goal of the organization?
- What is your role within the organization?

Q.2 What types of programs does your community action council provide?

Q.3 What type of methods do you use to collect data about the members of the community that use your programs?

Q.4 What type of data do you collect on your members?

- Is there data collection that you wish you kept track of?

Q.5 Does your organization use any type of database management/tracking system with its data collection?

- If no, would your organization be interested in learning more about database management systems that could potentially help the overall organization of your city council?
- If yes, what type of database management system does your organization use?

Q.6 Does your organization work with multiple agencies around the community?

- If so, how do you share data? What is the data that you share?
- If not, do you share your data with anyone?

Q.7 Are there any questions that you think we missed in order to gain more insight about your organizations data collection?

Appendix G: WCAC Participants Question Set

Q.1 Please tell us something about yourself.

- What programs are/were you in the WCAC? (Remind them if we know; they might not remember)

Q.2 Could you briefly explain your experience with the WCAC?

- What are they helping you with now?
- What have they helped you with? (alumni)
- What other programs are/were you involved with? (other organizations)

Q.3 How often would you estimated that you meet (weekly/monthly with a WCAC member?

Q.4 Is the process of applying to the program and other steps easy to follow?

- Apply online or on physical paper
- Besides applying, what other steps are there to follow

Q.5 What are your suggestions on how the WCAC could improve their summer employment programs?

Q.6 Do you feel you gained valuable skills through the training you received? (Can you tell us more about your experience? Use prompts to get them thinking, knowledge, skills, contacts)

Q.7 Do you feel an online platform that gives you access to your progress would have made the experience any more helpful? (Would you like to stay in touch? What would it look like to be able to stay in touch) (get them to generate their own ideas)

- In terms of knowing programs available
- Next steps moving forward

Appendix H: Interview Information Summary

1. Masshire
    - Data collected: The executive director for Masshire Central Workforce Board. Collects data on basic demographics among the youth within Masshire and the barriers they face to receiving employment.
    - Communication: Data from youths is hand delivered to them by contractors. Communicate with youth through "Moses employment system database."
    - Challenges: Biggest challenge is miscommunication with the youth. It is time consuming and difficult to interact with the youth within the program.
2. Worcester public schools
    - Data collected: Data collected is primarily on youth within the public schools and their progress: internships/internship completion, college course completion.
    - Communication: Data sharing can only happen once an intake form is collected. Permission is given at the district level.
    - Challenges: a lot of overlap which makes it challenging to streamline data sharing and collecting.
3. Pleasant Street Neighborhood Center Watch
    - Data collected: Main role is to support youth activities, not to collect data.
    - Communication: Data is shared through paperwork.
    - Challenges: Biggest challenge is miscommunication with the youth, specifically having a difficult time contacting them.
4. Worcester Public Schools Transition
    - Data collected: Data is collected involves a student's individualized education plan.
    - Communication: Communication is not day to day. Information is shared with a third party, who has access to data sheets.
    - Challenges: There is no way of collecting data with community data. There are also a large number of students, making it difficult to keep track of information.
5. Worcester Youth Leadership Institute
    - Data collected: No data is collected.
    - Communication: Work with WCAC within the task force, specifically Tim Murray.
    - Challenges: biggest challenge is miscommunication with the youth
6. Division of Youth Opportunities
    - Data collected: Pre-surveys and surveys at end of program. Daily information involving end of day questions with youth members.
    - Communication: Data is shared with the city manager's office. Data and information are shared from Worcester public schools.
    - Challenges: Miscommunication with the youth. Also need family contact information from Worcester public schools.
7. CiviCore

- Builds specific databases for client's needs
- Works with other non-profits
- Comes at a cost
- Done in 3-4 months with monthly support

8. Youth Participants
    - "Useful", "easy" and "accessible" were words used by Youth when describing how an online platform would be useful
    - Helpful being able to see job postings, and able to post their interests.
    - Nice to be able to update their own profiles with new information
    - Connect through Mobile Apps
        - Social Media, LinkedIn, Profile they do not necessarily have to set up.
9. WPI Registrar
    - Provided information regarding student progress tracking at WPI. Included:
        - What database(s) are used
            - BannerWeb, Workday (way too pricey for a nonprofit) similar use
                - Some are flexible and other are rigid not allowing you to bend it perfectly to what you need
                - Student login and profile is necessary
                - Can update contact information, change major (interests)
        - Who uses them within WPI
            - Registrar has overall access
            - Sub departments have limited access to who they can see and what information
                - 12 staff maintaining and tracking the information flow