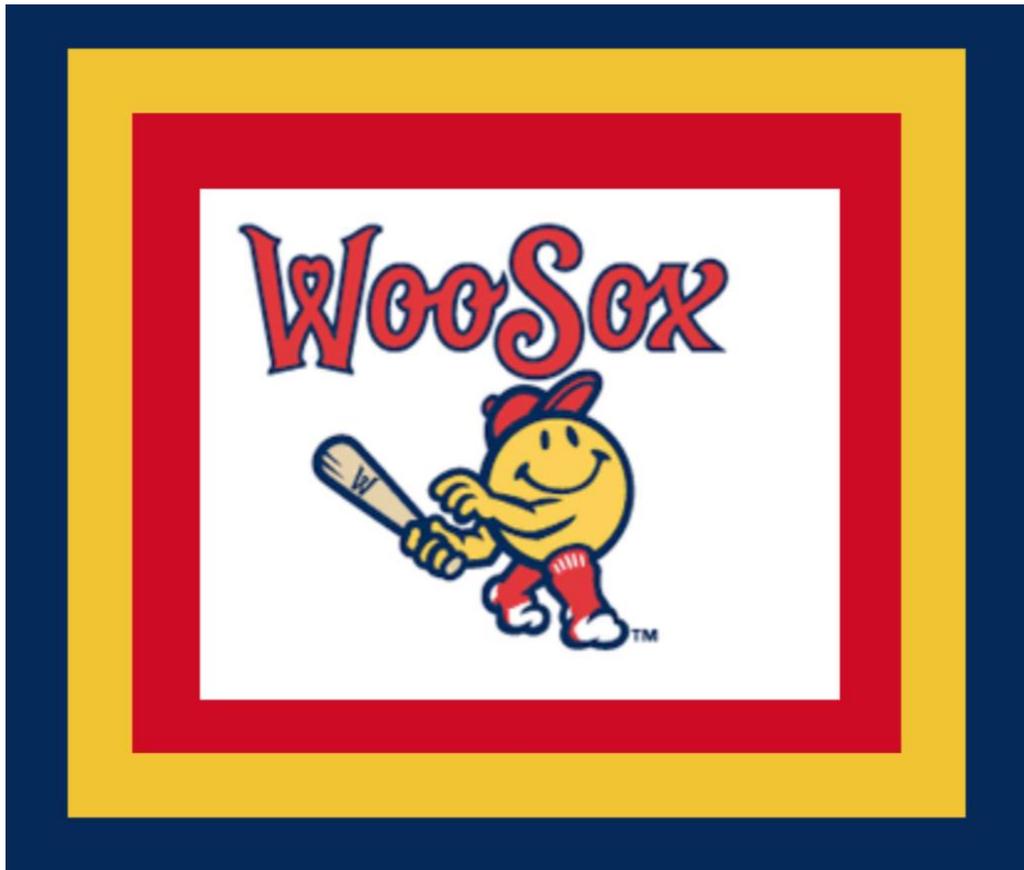


# Persona Development for the Polar Park Mobile Application



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degree of Bachelor of Science

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Report Submitted to:

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**WPI**

Worcester Community  
Project Center

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# **Abstract**

The Worcester Red Sox plan to open the world's most innovative ballpark in the heart of Worcester, Massachusetts. To achieve this goal, the company is developing a stadium-specific mobile application that will provide the best user experience. Working out of the Worcester Community Project Center, our main goal was to survey the target population, in order to understand what benefits people are looking for in this mobile application. With over 400 responses to our survey, this information was sorted, analyzed, and relayed to the Worcester Red Sox as to what features they should include in their mobile application. Our data was displayed in the form of a benefit/feature infographic and seven personas that represented the potential users of this mobile application.

# Acknowledgments

We would like to express our extreme gratitude to those who have supported our team throughout our project. With challenges due to making our project completely virtual because of COVID-19, our team could not be more grateful for those who aided us in making sure our project was a success.

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Additionally, we would like to thank our interviewees and survey-takers for providing us with the data to give the Worcester Red Sox useful information to best design their new mobile application.

Finally, we would also like to thank our advisors from Worcester Polytechnic Institute: Professor Purvi Shah and Professor Sarah Strauss. Thank you for your guidance and support during the course of our project. Your assistance, valuable input, and continuous feedback allowed us to bring this project to its utmost potential.

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“Worcester” Red Sox	Jerry Perez	Billy Duulal
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# Executive Summary

In August of 2018, the Pawtucket Red Sox announced that their team would be relocating to Worcester, Massachusetts. Currently known as the Worcester Red Sox, they have launched the construction of Polar Park which will be their new stadium. The team plans on opening the world's most high tech, state of the art ballpark for the fans, and in doing so, they hope to develop a ballpark mobile application that will provide the best possible user experience. Giving the attendee the most positive experience across all aspects is one of the main objectives for the Worcester Red Sox management team. Those who are responsible for giving life to the idea of Polar Park, ranging from the marketing persons to the president, all have one goal in mind: to develop the most innovative application whilst giving the user one of the best experiences.

When designing the park, and specifically when designing the application for the park, the company wants to make sure people of all ages, abilities, ethnicities, and socioeconomic status can use the application. In order to accomplish this, it was extremely important for the Worcester Red Sox to understand the demographic, psychographic, and behavioral profiles of their new Worcester fan base. In order to help them in this process, our goal was to identify audiences in the general Massachusetts areas that could form various characters of the Worcester Red Sox fan base. This facilitated the conversion of potential benefits that customers are seeking into the useful features within a mobile application. Ultimately, the combination of targeted audiences alongside the necessities that different groups require, will guide the future developers of the mobile application. The effectiveness of this mobile application is not only to keep existing fans in attendance, but to bring an influx of new fans by making attending the Worcester Red Sox games a fun, effortless, and exciting experience.

## ***Data Collection***

Our team has conducted 16 interviews scattered throughout Central Mass and distributed our survey to more than 3,500 people. These 16 interviews were used to tailor a survey that provided us with both the necessary demographic, psychographic, and behavioral information, as well as data regarding individuals desired benefits from the mobile application. This helped us understand who is taking the survey and what group of people they best represent. Due to time constraints, only the initial 404 responses to our survey were included in our analysis, but over 838 responses were recorded because the survey remained active and running. By analyzing the data collected from the responses, we were able to construct seven different personas to represent the large potential fan base of the Worcester Red Sox and the benefits they were seeking from the Polar Park application.

## ***Data Analysis, Findings, and Persona Development***

Some of the highlights of the survey include participant willingness to pay for certain special features, parking concerns, navigation, and concession time. However, the most emphasized points were parking, concession stands, and price. After analyzing the survey results, we began to construct the personas that encompassed the population we were sampling. In our case where there was such a large response rate, we decided the best way to depict the data we gathered was through the creation of seven unique personas. Each persona represents data collected from the individual survey responses, so that all individuals can be classified by the persona in which they best fit. These 7 personas and their desired benefits are shown below:

1. The Worcester Student: Jeffrey Davis
  - a. Easy Parking Finding/Purchase
  - b. Socialization - Certain Promotion Nights
  - c. Mobile Ticket Purchase (with seating map)

- d. Sports Betting and Gambling
  - e. Mobile Schedule & Live Player Statistics
  - f. Mobile Concession Ordering & Delivery
2. The Head of the Family: Joe Smith
    - a. Affordability- Special Prices for App Users
    - b. Easy Parking Finding/Purchase
    - c. Child Entertainment - Kid Friendly Games
    - d. Mobile Concession Ordering & Delivery
  3. The Die Hard Fan: Angel Ortiz
    - a. Easy Parking Finding/Purchase
    - b. Mobile Ordering & Food Delivery
    - c. Feature Location all in Same app - No Confusion
    - d. Mobile Schedule & Live Player Statistics
    - e. Sports Gaming- minigames/card-collection
  4. The Single Worker: Alexandra White
    - a. Socialization - Certain Promotion Nights
    - b. Transportation Planning
    - c. Mobile Concession Ordering, and Delivery
    - d. Gifting (Special Messages) and Souvenirs
    - e. Mobile schedule & Live player statistics
  5. The Empty Nester: Patricia DeMaury
    - a. Easy Ticket Purchase
    - b. Park Navigation
    - c. Reservations and Reviews for Nearby Restaurants (with ratings)
    - d. Live Commentary
  6. The Physically Challenged: Susan M. Hillard
    - a. Accommodation Planning and Descriptions
    - b. Accommodation-Friendly Routes Throughout Park
    - c. Digital Concession Stand Menus
  7. The Caretaker: Barbara West.
    - a. Accommodation-Friendly Routes & Areas on Interactive Park Map

b. Premium Seating and Seating Upgrade

### ***Recommendations***

In this project, we collected data from the final consumers in order to provide information for a Business-to-Consumers (B2C) strategy. For the future, we also recommend the Worcester Red Sox gathering data for a Business-to-Business (B2B) strategy. This strategy could form partnerships with fellow businesses that are located in Kelley Square and the surrounding areas – not only for bulk ticket sales but also for strategic promotional alliances. Our team recommends for the Worcester Red Sox to target local universities, companies, and other organizations for institutional or corporate ticket sales. In addition, promotional tie-ups with local restaurants and takeout spots will also add value for fans. Some that we recommend targeting include Kelley Square Pizza, SmokeStack Urban Barbeque, The Banner Bar and Grille, The Hangover Pub, Insomnia Cookies, Table Talk Pies, Wings Over Worcester and Birch Tree Bread Company. To form a strategic alliance with these restaurants, the Worcester Red Sox could investigate potential partnerships or promotions between them. With new hotels and businesses popping up in the area, we would also recommend the Worcester Red Sox to target these businesses to see if there are any partnerships that can be formed.

Another thing we recommend the Worcester Red Sox to look into is the Kids Club. Many parents would like to see an additional way for their children to be entertained during the ball game. For example, having a place to bring the kids for an inning or two can break up the game and help keep the kids engaged. We would recommend the Worcester Red Sox to further investigate the interest parents have in this feature. With that being said, as the park opens, it would be very important to conduct an additional survey about the features the mobile

application currently provides. This will help the Worcester Red Sox understand what features have proven to be beneficial to the mobile application users and which features are not needed.

## ***Conclusion***

All in all, our team was able to discover underlying issues that consumers face or might face when going to a large-scale event like that of Polar Park, whether this is missing the game due to parking delays, not having adequate social aspects, or lack of physical accommodations. Our team can firmly say that we have proposed ideas here that have the ability to make one of the best baseball stadium specific, mobile applications of all time. We believe that if the personas are heard and their ideas are executed, the Worcester Red Sox sponsor team has the ability to make a break-through in setting the standard for all other stadium specific apps. In addition, they have the ability to implement an application that'll stand the test of time and generate foot traffic like never before!

# Introduction

The Pawtucket Red Sox announced in August of 2018 that they will be closing McCoy Stadium and moving their minor league baseball team to Worcester, Massachusetts (DeCosta-Klipa, 2018). As they make this change, they have recently launched construction of Polar Park: the new home of the Worcester Red Sox, also known as the WooSox. This change is exciting for the company as they begin to realize their goal of developing the world's most innovative, high tech ballpark.

Worcester is the second largest city in New England. The city is home to 180,000 people and it is a big melting pot when it comes to ethnic groups. The ethnicities of Worcester consist of White (57.1%), Hispanic (20.9%), African American (11.8%), Asian (7.29%) and others as of 2017. While the national average for US citizenship was 93.2%, Worcester's was lower with 88.8% US citizens and the other 11.2% were not (Data USA, 2017). People from many different cultures, nationalities, and backgrounds will be attending these baseball games.

Over the past few decades, technology has begun to rapidly emerge in stadiums nationwide. This consists of mobile payment for food or souvenirs, wireless networks, large video screens, touch screen kiosks, high speed cameras for streaming and much more! The increasing popularity of various sports all around the world has sprung the development of improvements, not only in the sport itself, but where it is watched as well. Hence, it is crucial for development teams to take into consideration different audiences, and how they can appeal to them. Giving the attendee the most positive experience across all aspects is one of the main objectives for the Worcester Red Sox management team. Many of the features mentioned above have the ability to be converted to a mobile platform that give users the ability to take control of their experience. One way to accomplish this is through a mobile application for Polar Park that helps attendees

buy tickets, purchase food, check parking status, and much more. Those who are responsible for giving life to the idea of Polar Park, ranging from the marketing persons to the president, all have one goal in mind: to develop the most innovative app whilst giving the user one of the best experiences through it.

Whenever a baseball stadium is built, various logistics ranging from architectural design patterns that affect the sport directly, to promoting a positive fan experience, are taken into consideration. Typically, the experience of an attendee at a sporting event is conditioned by ballpark attributes that make it easier to navigate, and result in a memorably positive outcome. More specifically, a seamless experience of attending a baseball game can consist of being able to place an order for a meal directly through an application, so that you don't have to miss part of the game. Based on current fan experiences within baseball stadiums, there is a solid foundation for what features to include in the potential app.

However, to effectively and successfully implement these features, there must be detailed information on the demographics and psychographics of the potential users, and what appeals to different citizens. The Worcester Red Sox Foundation wants to make sure everyone feels welcome and included at the new Polar Park. When designing the park, and specifically when designing the cellphone application for the park, the company wants to make sure people of all ages, abilities, ethnicities and socioeconomic status can use the application. In order to accomplish this, it is extremely important for the Worcester Red Sox to understand the demographic, psychographic, and behavioral profiles of their new Massachusetts fan base. Since going to a baseball game is a classic American experience, they want to make sure all people can enjoy the game. From the game to the concessions, all fans have different reasons for attending.

Now located in Worcester, the WooSox wants to captivate all possible baseball fans by widening their target audiences.

In order to help them in this process, our goal was to identify audiences in the general Worcester and surrounding areas in Massachusetts that could form various characters of the Worcester Red Sox fan base. This will facilitate conversion of potential benefits that game attendees are seeking into useful features within a mobile application. Ultimately, the combination of targeted audiences, alongside the necessities that different groups require, will help form a tailored mobile application. The effectiveness of this mobile application will be not only to keep existing fans in attendance, but also to bring an influx of new fans and inspire the love of baseball. This will be accomplished through an unforgettable experience that engages Worcester Red Sox spectators from the start to the finish of their journey at Polar Park.

# Background

In this chapter, we begin with a brief overview of our project, which focuses explicitly on why we have collaborated with the Worcester Red Sox sponsor team. The next step describes the customer journey, including which benefits are most useful for various segments of people. We will then transition into segmenting, targeting, and positioning, persona development, and finally the user experience of an app.

## *“Worcester” Red Sox*

In August of 2018, the Pawtucket Red Sox announced that they will be relocating to the heart of Worcester (Glaun, 2018). Currently, construction is in progress for a \$240 million-dollar renovation of the Canal District consisting of hotels, apartments, retail stores, restaurants, and plenty of parking, as well as a long-needed redesign of the famed Kelley Square intersection. Come 2021, a completely reimagined Canal District is what awaits citizens and business owners. As it stands, the self-funded Polar Park stadium will cost \$90 million, and will not affect taxpayer dollars (Hanson, 2018). Worcester Polytechnic Institute has partnered with the Worcester Red Sox team to determine how a mobile application can enhance the fan-experience.

## *Our Goal*

Upon joining forces with the Worcester Red Sox sponsors, we have helped them determine certain benefits that appeal to specific groups of people. We accomplished this by studying various groups of people within the Worcester Red Sox fanbase in order to determine what benefits and features are feasible for a mobile application. This can be broken down further by using the persona development process with a two-step approach. First, we conducted interviews on different audiences in order to gauge what personas, and persona traits, were

present in the Worcester and surrounding areas of Massachusetts. The second step was to use the interviews to tailor a survey that can be distributed to the general population of Massachusetts. The finished product is an infographic representing the benefits and their corresponding features for a Polar Park mobile application, alongside seven personas to represent the potential users of the mobile application.

### ***The Customer Journey***

First, we needed to determine the customer journey, and precisely what it is. The customer journey is a multidimensional construct which follows the customer's experience as they go on through all the stages and touch points of the purchase journey (Lemon, 2016). In addition, the president of the Worcester Red Sox, Dr. Charles Steinberg, during personal communication, explained the aspects of the customer journey as an eight-step process. Dr. Steinberg stressed the importance of taking these steps into consideration when creating the new Worcester Red Sox mobile application. Figure 1 demonstrates the different stages and a brief overview of the customer journey.

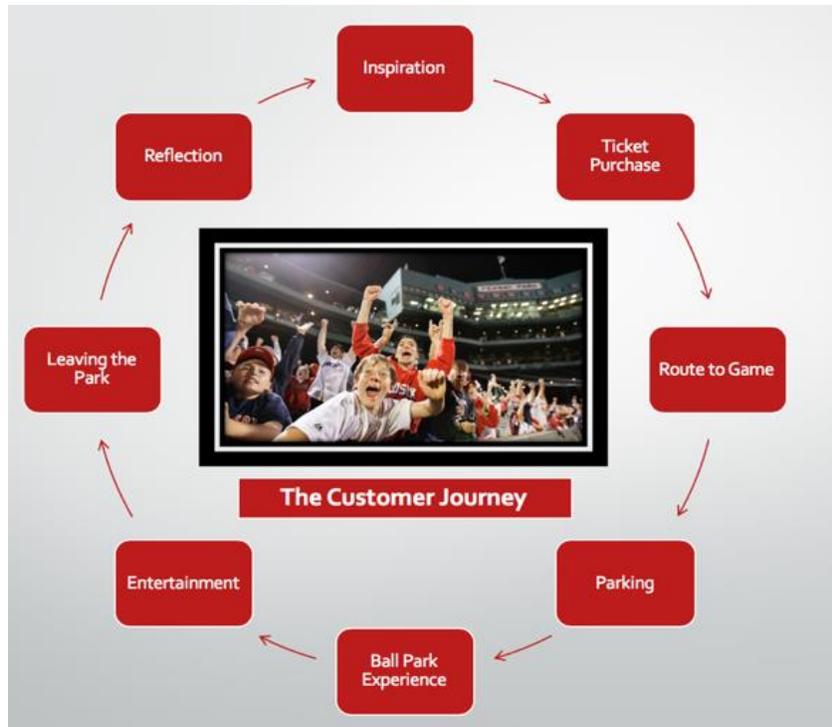


Figure 1: The Customer Journey: A circular experience beginning with proper inspiration and ending with a positive reflection.

### *Mapping the Customer Journey*

The first step of this process is the inspiration that provokes a customer to want to go to a Worcester Red Sox game. This inspiration can be in the form of an ad, billboard, radio commercial, hat, or any form of advertising. The next phase is the ticket purchasing phase. This step is critical for the application because customers need a secure and easy way to purchase tickets. The next phase is perfecting the route to the game. Getting to the game needs to be painless and straightforward. Next, parking needs to be a smooth process. Ideally, this would be another feature of the mobile application. The customer experience journey then focuses on the ball game experience including who greets you, the personality of the ushers, the condition of the restrooms and the quality of the ball game. Entertainment is also an important aspect because people need to be kept engaged and happy throughout the ball game even if they are not baseball

fanatics. The next phase is exiting the park. People must have a positive experience leaving the park to ensure they leave on a positive note. Finally, the last phase is the reflection upon the experience. Customers need to reflect positively upon the experience so that it becomes a circular process, and they continue to attend games.

### *Digitizing the Customer Experience*

There are many applications that exist for the purpose of lessening the burden for the complexities that humans face on a day-to-day basis. There are even fewer applications with that same goal in for the context of sporting event stadiums. When going to a sporting event, there is a certain routine that must be planned. You need to purchase tickets for certain seats first, then you try to find your way to the stadium, attempt to find parking, process your tickets to get into the park, and so on. This list doesn't even begin to touch upon the challenges that might be faced once you finally begin to enjoy the game. For instance, having to miss a portion of the game to grab a bite to eat, or not knowing where the bathrooms are. According to Deloitte, application developers that digitalize the customer experience find, "by digitizing the customer journey from ticketing to postgame and beyond, they are getting closer to the fans and working to deliver more personalized experiences" (Arkenberg, 2019, para. 7).

### *The Customer Journey - Ticket Purchase*

Benefits, in contrast to features, are particular aspects that an attendee desires in order to make the fan experience possible. The first application that we analyzed that gives the fan enormous benefits was SeatGeek. SeatGeek is a ticket selling company that ultimately gives the user the benefit to purchase tickets for a particular event. SeatGeek is rapidly becoming the preferred ticket seller because of the software's ability to connect with the audience in a way that is visually attractive while being secure. For one, teams that have large fan bases find it very

difficult to ““know exactly who is showing up and who they should be talking to”” according to D’Souza. (Rovell, 2018). With software like SeatGeek, fans now have the ability to know exactly where they’re sitting, as well as make inferences as to what personalities might be around them. In addition to that, SeatGeek also gives the user the ability to find tickets for any desired price for any given location. What makes this application superior to the others is the ability to visualize where you will be sitting, and what kind of deal the price is for that location. We firmly took into consideration features similar to SeatGeek since they have the ability to benefit any attendee in a positive manner. Taking the stress out of the only way to attend, in purchasing tickets, is the most crucial part of developing an application that will give the user a positive experience. SeatGeek, as a ticket booking/purchasing application, also has many features that can aid the Worcester Red Sox with engagement. For example, there are features that grant the user the ability to determine what ticket is the best bang for the buck, has snapshots of how close they will be, and a roadmap to wherein they will be located, all of which can ultimately ensure high engagement for the Worcester Red Sox.

### *The Customer Journey – Solutions for a Stress-Free Experience*

Another really interesting technology that is slowly being incorporated in a few baseball stadiums is iBeacon ([developer.apple.com/ibeacon/](https://developer.apple.com/ibeacon/)). This technology was created by Apple and is a low-energy Bluetooth transmitter that allows a phone to listen for signals in the real world and react accordingly. Say, a fan walks by a concession stand; their phone might detect an iBeacon and push a notification about menu options onto their display. These notifications can consist of autonomous concession stand information (in terms of location), short video segments, and offers for souvenirs or food. These all have the ability to connect with the fan in an effortless fashion (O’Grady, 2013). These same beacons can display an image of the barcode on your

ticket via a cellphone to show at check-in. This technology benefits the fans in the form of a smooth and seamless experience that allows them to walk around the ballpark freely without having to open different applications for different functions. Even more so, this technology is almost as good of a marketing tool as it is a means to make individuals' lives easier. Imagine walking around a ballpark and originally not thinking about buying food, but suddenly getting a notification that gives you a decision-changing deal through a promotion for food!

### *The Customer Journey - The Food Experience*

Lastly, a feature that we considered heavily for its remarkable benefits to the fans was mobile ordering for food and possibly merchandise. One company, FanFood is exploring the feasibility of mobile food ordering, in which it “supplies venues and concession stands with mobile application-enabled tablets that can display incoming orders” (PYMNTS, 2019, para. 5). If properly converted into a feature, this can provide one of the greatest benefits for a mobile application within the Polar Park. Long gone are the days of missing the game while waiting for food! If executed correctly, giving the fan the ability to order their food directly from an application can be extremely critical in delivering a positive user experience. There has been an emergence of massive companies that deliver these same features: UberEats, GrubHub, DoorDash, PostMates, and so many more. These companies make their sole business from delivering food in one way, shape, or form to their clients. This represents how services like these are successful; they appeal to a wide variety of individuals. Even giving the user the ability to order and pick up their food at their own convenience was a sought-after perk. Another benefit that was considered for the Polar Park application: being able to order a jersey, or some souvenir, of a buddy’s favorite player and having it delivered directly to their seat with a message. Overall, the customer journey explains the different stages from initial enticement to reflection of the

ballpark experience. In order to target each stage of the customer journey, different marketing techniques were used throughout our project.

When conducting research on the target audience for the Worcester Red Sox mobile application, it was important to consider known marketing techniques. Each of these stages of marketing is important in order to encapsulate the correct users for the mobile application. Segmentation is the identification of groups of consumers based on their common needs. This was the stage of marketing that we focused on most during our project because persona development was the technique we used to identify customer segments. Segmentation takes into consideration the specific needs of the people based on their “demographics, psychographics, lifestyle, belief and values, life stages, geography, behavior, and benefits” (Hanlon, 2019). These characteristics were used in order to identify and create groups of people that represent the fanbase.

After segmentation, targeting was the next marketing phase in which target segments are selected and evaluated. During this stage, the company decides what the most important needs are that they want to fulfill based on each of the different bases on segmentation. These targets vary depending on certain geographic, psychographic, demographics, benefits and various socioeconomic behaviors between potential users (Albaum, 1983).

As mentioned before, segmentation is the identification of the most common needs among consumers, hence companies will try their best to satisfy their consumers. Companies cannot satisfy every single one of their customers due to limited resources, so targeting profitable segments becomes essential. It is important that the company focuses on one or few particular market segment(s) and therefore this stage was done only after the segmentation stage was complete (Wright, 2018). The following factors that needed to be taken into consideration to

ensure that a viable target market was selected included: (1) making sure the size of the target market is commercially feasible, (2) knowing the expected growth rate of the target market, (3) entering a target market with less competition, (4) knowing the expected cost of reaching the market, and (5) knowing the compatibility of the target market to the company's goals (Hopps, N.D). Based on the data we collected, we crafted several personas representing the market segments and then we narrowed them down in order to choose the personas which could be a profitable and growing target market for Polar Park.

Finally, the positioning stage is where the company differentiates its marketing communications for each segment or persona that the company plans to target (Hanlon, 2019). This is how the company will market to their specific audiences and decide where and how the company will employ their marketing strategy. Upon analyzing marketing techniques, we progressed into the development of personas and how this tool had the ability to shape the template creation for our mobile application.

### ***Persona Development - An Overview***

Persona development allows for “envisioning real users in the form of a persona rather than abstract groups of people” (Coorevits, 2016, p. 98), to alleviate the stress of analyzing a target audience as a whole. One major aspect of our project was developing a number of personas based on market research in order to represent the Polar Park attendees' population. These personas included the desired benefits of attendees, alongside any needs they may have. When developing these personas, research was conducted throughout the Worcester and general Massachusetts population in order to gauge the needs of people. These needs were specifically based on age, gender, education, occupation, ability, ethnicity, means of transportation used, media habits, social media usage behaviors, and economic status.

### *What is Persona Development?*

Persona development is a way to categorize commonalities through the creation of “fictitious, specific, and concrete” (Humphrey, 2017, p. 13) people that represent the needs of a population as a whole. These personas are “fictional characters that embody typical characteristics of the different potential user groups of the innovation under development” (Coorevits, 2016, p. 98). The creation of personas is important because it “helps developers establish a stronger user focus and act as a constant reminder for whom one is and is not designing” (Coorevits, 2016, p. 97). For our project, the development of these personas gave the Worcester Red Sox sponsor team an idea of who they needed to accommodate for when developing their application. Through the creation of our personas, our group was able to encompass the community of Worcester and the surrounding areas and prioritize their needs in order to represent the target population.

### *Stages of Persona Development*

There are many stages into proper persona development as noted by the organizational research conducted by [usability.gov](https://www.usability.gov), a leading resource for user experience (UX) best practices and guidelines. According to their website, to begin persona development user research should be conducted. During this stage in the process, the people in consideration should be defined. After the target users are defined, their behaviors, needs, and expectations should be researched (O’Connor, 2011). Once all the research has been conducted, it is important to condense the research to look for themes and characteristics that are specific, relevant, and universal to the system and its users (Dong, 2010). This information should then be grouped into commonalities between users. This stage was necessary because the most important commonalities needed to be considered, whereas other needs that may not be important did not need to be considered. The

Worcester Red Sox potential users were categorized based on common needs and desired benefits. Our research was expedited because heterogeneity in each data subset between needs of the users had more importance in our research. Finally, the groups were combined and prioritized into rough personas. These personas encompassed the most important commonalities between users. After this was complete, the rough personas were made into realistic characters. This stage was where appropriate descriptions of each person's background, motivations, and expectations are decided. It is important to note that personas should be realistic and serious, not humorous (Dong, 2010).

### *Items to Consider When Developing a Persona*

When developing a persona, there were certain guideline questions that needed to be considered in order to create an effective persona that encompassed the correct needs of a population. According to [usability.gov](http://usability.gov), these items to keep in mind include:

- What is the age of your person?
- What is the gender of your person?
- When and where will users access the application?
- What technological devices does your person use on a regular basis?
- What software and/or applications does your person use on a regular basis?
- Through what technological device does your user primarily access the web?
- What is your person motivated by?
- What are they looking for?
- What is your person looking to do?
- What are the needs?

Overall, these questions aided us in developing our interview framework for gathering information to develop the personas.

### *User Experience*

With so many great and accessible mobile applications on the market right now, many developers tend to forget about experiencing the application from the consumer's perspective.

Before focusing on developing an application that will bring the best user experience, the developers must “acknowledge the human needs and requirements in the design and deployment of quality and user-centered design can ensure the success of the interactions between humans and computers” (Abduljalil, 2011, p. 1446). In order to ensure an effective mobile application, thorough research on the fan community needed to be done. Once the target audience was determined, that information was a great asset to base the design of potential features for the application.

The application itself should be user-friendly, appealing, and be composed of easy data entry points for rapid, and simplistic references. Moreover, the application should be easy for the user to maneuver; they should be able to navigate the application with no trouble. Likewise, any developer creating an application targeted towards a specific group should include the user in the application development and design stages. This can be a huge advantage since it creates a user-friendly environment while creating trust between both fans and developers (Abduljalil, 2011, p. 1446). The benefits received from the features of the application should always strive to satisfy the users’ needs.

### *What is User Experience?*

User Experience, UX, is the user’s subjective psychological feeling that they experience when using the products. In studying user experience for an application, it was vital to distinguish the difference between benefits and features. Benefits eventually turn into features, but they are a preemptive determination of what makes the user’s life easier. Features, on the other hand, are the final implementation based on how particular benefits will be obtained. “It runs throughout the product design and innovation process. The user experience is not how a product itself works, it is how to "touch" and "use" this product” (Chen, 2018, p. 1). Essentially,

the goal of the UX is to have the user interact with the application in a way that is easily navigable and acceptable.

### *User Experience Design*

User experience design involves the collaboration of users and developers. In this stage of development, users have a voice in the project. “It takes the user experience as the center, to ensure the user’s actual demand” (Yu, 2018, p. 1). Analysis of a mobile phone application case study concluded that “based on the concept of modern consumption, market competition gradually changes from general products competition to brand products competition, so the user experience design has become a new design method of brand products competition” (Chen, 2018, p. 1). In the Worcester Red Sox situation, a general ‘baseball application’ wouldn’t have succeeded as much compared to a designated ‘Polar Park’ application. The purpose of designing an application for this ballpark specifically was to make many audiences feel like the application was tailored to them specifically. For the optimal user experience, first impression, usability, difficulty, and exclusiveness were major factors to address. Essentially, what this entails is that the application has to appeal to the user’s eyes while grabbing their attention. Additionally, the application should be fairly easy to use, and shouldn’t be a copy of another application.

Overall, by understanding the main topics of our project, the group could easily create and gather data in order to capture insights about the target audience. This data was used to create personas to encapsulate the desired accommodations and benefits of real people. The methods used to gather data, and create our final deliverables are described in the next section.

# **Methodology**

The goal of the project was to obtain data from Worcester and Massachusetts areas, in order to learn about the desired benefits that potential sports facility mobile application users are seeking. By doing so, our team represented the target population through the creation of personas. The following methodology contains our research methods for obtaining this data. As a group, we decided to obtain this data through virtual interviews of different people in the target area. Due to the COVID-19 outbreak, all interviews were conducted virtually, either via Zoom or phone call, depending on the subject's preference. After these extensive interviews were conducted, we created a short survey and collected data from individuals in the surrounding areas.

## ***Methodology Approach***

The Worcester Red Sox are focused on collecting information regarding various personas in order to ultimately develop a template for a mobile application. In order to do this, our team captured information about a large number of people in order to make general observations about these groups. These observations tell us exactly what information is useful for developing application features based on particular benefits that these potential users are seeking. To obtain this data, our team created a two-step approach. To begin, we conducted virtual interviews of various populations via Zoom calls or phone calls. Once these interviews were conducted, we analyzed the information in order to develop detailed questions for a survey. These questions highlighted common themes between interview questions in order to grasp the general public's opinions. The surveys also allowed us to reach a wide audience with fewer resources than competing methods. In addition, these surveys allowed us to make broad generalizations as to benefit importance and what the users needed as opposed to what is wanted. Using surveys to

capture various audiences has allowed our team to obtain a large number of responses, from which we could triangulate the interview findings. This contributed to our decision about which features would be the most important for the initial launch of the Polar Park mobile application.

## *Interviews*

An interview is a series of questions asked to a specific individual about a certain topic (Easwaramoorthy, 2006). Since the goal of our project was to develop various personas based on gathered information, we needed to find an effective way to actually form these personas. There are three main types of interviews that can be conducted ranging from structured interviews to unstructured interviews. Structured interviews use “a verbal questionnaire in which the interaction is limited by a script and a fixed set of questions” (Wilson, 2014, p. 2). This type of information is great for collection demographical information or other uniform data because there is no fluidity in the way the questions are asked. A semi structured interview “combines predefined questions like those used in structured interviews with the open ended exploration of an unstructured interview” (Wilson, 2014, p. 24). These interviews usually follow an interview guide which has probes and prompt questions. They are typically used when there’s some knowledge about the topic under investigation, but further details are still needed they allow for the interviewee to provide their own opinions and attitudes while staying to a script. Finally, unstructured interviews are “conversations with the users and other stakeholders where there is a general topic and agenda but no predetermined interview format or specific questions” (Wilson, 2014, p. 44). The goal is to gather rich in-depth data about the users without imposing any restrictions by asking questions (Wilson, 2014, p.44). For our study, the semi-structured interview technique was chosen. Using this format, our team was able to create a questioner containing main prompt questions and many follow up probing questions to encourage our

interviewees to elaborate on their answers. The structure of our interview protocol can be seen in Appendix A and B. This is also an excellent choice since the interviewee already knows what they signed up for in terms of time and truthfulness, and more importantly because it allowed us to ask more in-depth personal questions in a relaxed fashion. Having the ability to get detailed information on the general Massachusetts population about demographics, psychographics, behavioral information, social media presence, day-to-day activities, and much more, was critical in developing the personas for this project. Since interviews are the most personal form of data collection, they were precisely what we needed in order to develop our personas. These interviews were then used as a steppingstone for survey development, allowing us to reach a wider audience.

For our project, the interviews were all conducted virtually, via Zoom and phone calls due to the COVID-19 outbreak. The method of interviewing was determined by the subject depending on what technology they were more comfortable with, whether this be by email, phone call, zoom call, FaceTime, and so on. Part of the process was understanding that different individuals might need their respective accommodations in order to make this possible. In addition, technological familiarity might also play a role in conducting the interviews virtually, and so on. For this reason, our team needed to revisit our IRB application to ensure that it suited the audiences that we were expecting in order for them to understand exactly what they were signing up for. The IRB process included drafting a consent form for the subjects in our study to gauge an understanding as to what we were doing and how we were going about it. If they felt uncomfortable with the terms that were being given to them, they had every right to decline.

### *Benefits and Drawbacks of Interviews*

There were many benefits to using interviews to gather information for this project. The collection of data through interview methodology gathers great qualitative data as well as giving insight into what certain individuals feel and behave when answering the interviews (Brickey, 2010). This was extremely important for persona development since we needed information regarding people's behavioral habits. Furthermore, interviews provided us with information to create well written surveys. The questions in these surveys were thoroughly written to directly represent common themes found from our interviews. Finally, interviews are ideal because they allowed for flexibility. They gave the subject a space to share their ideas freely without a time constraint. For example, they were asked open-ended questions and given ample opportunities to expand on an answer that might not have been meaningful in a short dichotomous format.

There were also some drawbacks to conducting interviews. For one, the interviews needed to be conducted virtually, which greatly limited our target audience and caused some technical problems. On the other hand, virtual interviews allowed us to geographically expand our audience. Initially, our group was planning to find interviewees physically by traveling to different locations and seeing if they had time for an interview. With Massachusetts being in a state of emergency, many individuals were in quarantine at home, giving them more flexibility to participate in these interviews, which in turn gave us the ability to reach out to a wider audience. Finally, interviews are very time consuming, which was a challenge given our short 7-week term project. Despite these drawbacks, having the ability to conduct virtual interviews opened up a lot of time and convenience, which increased the total number of interviews we could conduct.

### *Interview Participants and Process*

To obtain data that represented the target population, our group conducted virtual interviews involving community members. We interviewed residents with a diverse set of ages, economic status, ability, ethnicity. These subjects included Worcester college students, Worcester college student athletes, families, working class individuals, people with disabilities, and elders. Finding college students was very easy for our group since we have many friends willing to help participate in an interview. Families and working-class individuals were also easy to locate since one of our team members, Jerry Perez, grew up in Worcester, and had many family members, neighbors, and friends who were willing to participate.

After locating our initial interview subjects through family, friends, and acquaintances, we used snowball sampling, a recruitment technique in which research participants are asked to assist researchers in identifying other potential subjects (Kirchherr, 2018). Snowball sampling provided us with a larger variety of people to finish conducting our initial interviews.

Finally, we also received information from people with physical disabilities including visually impaired and hearing-impaired individuals, and individuals with mobility challenges. Through snowball sampling, these individuals were identified and more than willing to participate in our virtual interviews.

After the individual subjects were identified, we designed the interview protocol for these audiences. We ensured that the interview questions met all the IRB requirements for interviewing human subjects. During interviews with differently-abled participants, we followed a specific interview protocol specialized for people within a vulnerable population to ensure that the subjects felt safe and comfortable. These interview protocols and questions are presented in Appendices A and B.

These interviews were scheduled via Zoom or phone call depending on the subject's comfort and preference. Once the initial interview subject was identified, they were sent an email containing multiple times and dates in which our team could host an interview. A copy of this sample recruitment email can be seen in Appendix E. After the time of the interview was selected by the interview and scheduled, a Zoom invite or phone call invite via Outlook was sent to the subjects along with a copy of the Informed Consent Form (see Appendix C). If the individual was visually impaired, the Informed Consent Form as seen in Appendix D was read aloud to the individual before the interview began.

Once the information from all of our interviews was collected, we analyzed the data in order to develop a short survey to administer to the larger Worcester and general Massachusetts public and Worcester Red Sox fan base. In order to analyze the data, different steps were taken. First, our team reviewed and compiled all the data from the interviews in one google doc. This was a lengthy process since our team wrote down everything the subject said. After all the information was gathered, our team highlight key findings from each interview and began sorting the subjects into three groups: students, working class individuals and differently-abled people. After this information was compiled, we synthesized the data in order to understand what commonalities occurred between each group (Lune & Berg, 2018, p.199). Finally, these findings were used to help craft the survey. Specifically, we eliminated questions which proved to have little importance for our study and formed more questions about specific topics for the survey such as how much money people are willing to pay for certain features. Table 1 presents the sample description.

## *Surveys*

After conducting interviews, the information collected was used in order to carefully craft questions for a survey (Desimone & Le Floch, 2004). A survey is practically an anonymous interview about a specific topic that targets a wide audience. Surveys provided us with the ability to receive information from a wide range of people across Massachusetts whilst expending very few resources. Our group created specific questions that reached a wide audience and provided critical data for the finalization of our suggested mobile application features. Please see Appendix F for survey questions. Rather than using a specific survey that is dedicated toward one goal, our group created our own survey with questions that were tailored to generate personas. This gave us a better understanding as to what benefits these personas would need from an application at Polar Park and specifically how these benefits can be applied through application features.

After the tailored survey was created, they were distributed to a large demographic of people throughout Massachusetts. The survey was sent to the Worcester Red Sox Booster Club email alias, the Worcester Student Government Association, our own personal social media pages, and also distributed to our friends and relatives. These surveys allowed us to obtain data for the Worcester population at large, and triangulate the data we collected from the few in-depth interviews. This also saved a great deal of time against other methods. In many instances, other methods of data collection require follow-ups, in-depth planning, collaboration, and most importantly a significant amount of time (Jones, 2013). Surveys have a reputation to be used for quickly collecting data on either emerging topics or for company success. With proper collaboration, a well thought out survey can capture the responses we need in order to bring life to this project. With that being said, it was critical that these surveys asked the questions that we

wanted to know while including key persona questions in order to identify them subliminally. In doing this, our team benefited from diversification in responses, and quality feedback.

### *Benefits and Drawbacks of Surveys*

There are many benefits to using the survey method such as quantitative data, cost-effectiveness, reliability, versatility, and generalizability. Conducting surveys is a way to familiarize yourself with your target audience (Blackstone, 2012). For the purpose of our study, the surveys were used in order to receive information on the target population as a whole, not just the few selected through interviews. Surveys were used because they are great at gathering lots of information from various people from anywhere yet being cost-effective. In some instances, conducting surveys can be costly (Jones, 2013). For example, instead of having to test how a product would sell in a specific region, an online/paper survey could be conducted, rather than wasting valuable time, money and energy. Surveys are reliable because the questions in the surveys are consistent and regulated for each and every participant. However, if the questions asked are poorly written/phrased, participant responses are to be unreliable due to confusion that can lead to different interpretations and/or bias (Jones, 2013). Additionally, surveys can be very versatile. The versatility in surveys is a huge advantage as anyone can take part in or make a survey and conduct it. People from many different backgrounds, abilities, occupations, religions, ages, gender are able to take part. Lastly, since surveys can collect large amounts of information, they are considered as one of the best methods at representing communities and reflecting their characteristics (Blackstone, 2012).

However, this method is not perfect, and it has its fair share of flaws. Throughout the usage of the method, the team may have stumbled upon a few drawbacks. The team was aware of these drawbacks and cautiously prevented them. The drawbacks of survey collection included

customer fatigue, bias, validity and so on. When conducting a survey, the survey has to be a reasonable length. The majority of the time, customers tend to give up halfway or skip questions if the survey is too long (Blackstone, 2012). This was avoided by finding the right and proper questions to ask our subjects. We did this by analyzing the results of our interviews to inspire the survey questions. Another drawback is the data collected could have been biased if survey questions were not clear and concise. This was avoided by proper planning and testing of the survey design and structure. Finally, validity in surveys could have been problematic. This is an issue because the majority of the questions in a survey are general, regulated/standardized and do not allow broad answers (Blackstone, 2012). Therefore, when creating the survey questions, our group kept in mind the selectiveness of multiple-choice questions, as the survey-takers answers are limited.

### *Survey Audiences and Location*

To obtain input from the general Massachusetts population, our group conducted surveys involving Worcester residents as well as community members in the surrounding towns and areas. All surveys were administered using Qualtrics, an online survey design software (Barnhoorn, 2015). In person surveys could not be conducted due to the COVID-19 outbreak. We received anonymous information through these surveys from a wide variety of people. We surveyed residents with a diverse set of characteristics across attributes such as age, economic status, ability, and ethnicity.

The survey allowed the information to be answered quickly, while still obtaining valuable data from the participants. For this reason, the survey questions were created after the information from our interviews is gathered and analyzed in order to create the best questions for our subjects. Specifically, in these surveys, we determined what key benefits must be included in

a mobile application in order to give the audience the best possible experience in Polar Park. The application should include personal desires to each audience in order to make them feel like it was made with them in mind. Using the data received through these surveys, we found commonalities between the data and created personas necessary to highlight the needs and desires of different groups of people.

The first group of people we gathered data entries for are people on the already existing Worcester Red Sox Booster club fan base. The Worcester Red Sox sponsors provided us the email alias to send our finalized survey. This fanbase had approximately 3,200 fans, providing our group with a number of responses.

Our team also posted the survey on our personal social media pages, and shared the survey with our family and friends within the area, in order to widen our subject pool. The next group the survey was sent to the Worcester Student Government Association (WSGA). This group includes all 35,000 plus students across the ten Worcester Colleges. Due to time constraints, and slow response times from WSGA, the survey was sent out to the Worcester Colleges after our data was collected for our project analysis. Since the survey remained open, the responses generated from this group were still recorded and the information was shared with the Worcester Red Sox via an Excel sheet exported from Qualtrics. The sample description of the people who completed the survey, and were included in our analysis, is provided in Table 2.

By sharing the link to our survey, we found a variety of students and working-class individuals to participate. Each subject composed of different ethnicities, different aged family members, varying distances from Polar Park, different means of transportation to Polar Park, and varying economic status. Throughout the surveys, we found what benefits these individuals would like to have to increase their experience at a baseball game and encourage them to keep

attending these games. Having an online survey allowed people to complete the survey on their own time, at their convenience.

### ***Alternative Methods: Phone Calls and Focus Groups***

There are other methods that came to mind, but seemed out of reach for this project. One method rejected by our team was to phone call random local lines, which is typically done during election time. Since many people do not use landlines, and people who do tend to be elderly, this method was ruled out very quickly. This would completely eliminate any feedback from the younger population which is absolutely vital for a well-versed application. A focus group is an interview with many individuals about a specific topic, as opposed to just one person. We decided to rule out conducting our own focus groups because it is very hard to schedule and because it is extremely difficult to gather people at the same time and location (Nestel, 2012). Also, it is difficult to find individuals to participate in these focus groups. Finally, another negative is the conversion theory, where the majority opinion is adopted from the minority. This has the ability to skew people's true opinions (Villanueva, 2018). Furthermore, some individuals may feel reluctant to speak about personal beliefs. Overall, conducting focus groups is very difficult, but the data that is extracted from them can be extremely beneficial. For the reasons highlighted above, conducting our own focus groups wasn't ideal, and for this reason, no focus groups were conducted by our team.

# Findings

## *Findings - An Overview*

After conducting 16 interviews and distributing our online survey to over 3,500 people, our team has gathered sufficient data representing potential users of the new Polar Park mobile application. The report containing graphical illustrations of the survey responses can be seen in Appendix G. Due to time constraints, our findings only include data from the first 404 responses (response rate of 11.5%). However, since the survey remained active, over 838 responses have been recorded. In the first few hours of releasing the survey to the general public, we were able to gain over 200 responses, and almost 400 responses exactly one day after. Using this data, seven different personas were constructed in order to represent the variety of users the Worcester Red Sox needs to target with their mobile application. These personas can be identified in Appendix H. A summary of the desired benefits found from our study, and how we suggest implementing these benefits as Polar Park mobile application features, can be seen in Appendix I.

## *Data analysis*

For the purpose of our study, the information gathered from our in-depth interviews was mainly used for the creation of the survey. Doing so gave us the ability to better understand what audiences might be attending Worcester Red Sox games, and what questions were needed to ask a larger scale of those audiences. We conducted 16 interviews with audiences in two broad categories, the disabled and the non-disabled.

Through this approach, we aimed to achieve one main purpose for both audiences: how this mobile application had the ability to benefit *their* life. However, since both audiences lived

two completely different lifestyles, their answers to certain interview questions were vastly different. Analyzing the data from these interviews helped us not only to create a survey that appealed to both of these audiences on a broad scale, but also allowed us to generate responses that were more focused, and therefore beneficial to the sponsor. We were able to determine and share with our sponsors what benefits these groups of individuals sought from the application, and give them ideas to think about. For example, individuals who are physically handicapped simply cannot have handicapped seats that require going down a flight of stairs. In addition, we were able to gather results that pertain directly to our mobile application and filter them into separate categories that consisted of desired benefits.

We analyzed the qualitative interview data using four steps of qualitative data analysis.

First, we gathered all of our responses in one central location. Upon executing interviews, the goal was to use the questions as a guidance for where our answers were going to be recorded. For example, if we asked demographic questions, we would record the interviewee's answers right underneath the demographic section in red writing, and so on. This aided in the organization of moving all results to one document that was organized by category.

Second, was to come up with an approach as to how we wanted to represent the data. The options were by demographics, tech-savviness, or by desires. We found the easiest way to group the responses were to represent them by desire. This created a finite number of categories with very little crossover against the other options.

Third, we began to look for what kind of insights were given to us that would be beneficial for our survey creation. In essence, looking at these responses, what can we ask to make sure all audiences feel like they're taking a survey that is meant just for them?

Lastly, we used all considerations in order to carefully craft the questions that we wanted to ask in our interviews. Through this method of qualitative data analysis, our team was able to effectively create questions that seemed to be tailored to all audiences taking the survey.

The following are key findings from the interviews.

- |  |  |   |
|--|--|---|
| <p><b>Parking:</b></p> <ul style="list-style-type: none"> <li>• Willing to pay more for premium parking spots (with some exceptions) <ul style="list-style-type: none"> <li>◦ Max for closest parking: \$35</li> <li>◦ Max for in between parking: \$20-25</li> <li>◦ Max for distance parking: \$10-15</li> </ul> </li> <li>• Include parking purchase in the ticket purchase</li> <li>• Parking status indicator <ul style="list-style-type: none"> <li>• Green is open, Red is taken</li> </ul> </li> <li>• Valet for people with disabilities - need more handicap spots</li> <li>• GPS/parking assistance feature</li> </ul> <p><b>Concessions:</b></p> <ul style="list-style-type: none"> <li>• Food delivery to seat supported</li> <li>• Concession stand menu on mobile application</li> <li>• Souvenir delivery removes authenticity/experience</li> <li>• Mobile application to buy souvenirs might be nice since the lines are long</li> </ul> | <p><b>Ticket Purchase:</b></p> <ul style="list-style-type: none"> <li>• Needs to be safe, secure, and easily refundable</li> <li>• Many people already familiar with mobile ticket purchasing</li> </ul> <p><b>Park Layout:</b></p> <ul style="list-style-type: none"> <li>• Interactive map of the stadium layout and directory</li> <li>• Denoting whether or not a route on a digital map is safe for people with accommodations (wheelchair friendly, large signs, etc.)</li> </ul> <p><b>Accommodations:</b></p> <ul style="list-style-type: none"> <li>• Description of accommodations on app/site - what does the stadium provide for disabled population? ie. braille, signage, service pet rest area, handicap elevator, audio descriptions, etc.</li> <li>• Audio descriptions of commentary and game summary</li> <li>• Make hearing impaired and autistic people feel more included with live signing of songs on a big screen/application.</li> </ul> | <p><b>Interactive Features:</b></p> <ul style="list-style-type: none"> <li>• Kids Club sign ups - Description on activities at kids club each inning <ul style="list-style-type: none"> <li>◦ Parents must be involved</li> <li>◦ Cost associated</li> </ul> </li> <li>• Park interactive games for children to play</li> <li>• Mid-game trivia, play for a prize</li> <li>• Streaming/Live stats</li> <li>• Team schedule</li> <li>• Roster and player stats</li> <li>• Advertising for local restaurants <ul style="list-style-type: none"> <li>◦ Reserve table for when game ends</li> <li>◦ Discounts if you show your ticket</li> </ul> </li> <li>• Advertising for different themed nights coming soon to the park <ul style="list-style-type: none"> <li>◦ Concerts</li> <li>◦ Other Activities</li> </ul> </li> </ul> <p><b>Additional Notes:</b></p> <ul style="list-style-type: none"> <li>• Mobile application must be very easy to use and understand for people who aren't tech savvy or have language barriers <ul style="list-style-type: none"> <li>◦ Layman's terms</li> </ul> </li> <li>• Discounts, Coupons, Rewards for downloading/using app</li> <li>• Application must work regardless of phone carrier <ul style="list-style-type: none"> <li>◦ Stadium free wifi?</li> </ul> </li> </ul> |
|--|--|---|

Figure 2: Demonstrates the categorized interview findings

The analysis of interview data aided the survey development. Through our survey, we were able to determine many key ideas that can be taken into consideration for the developers of the Polar Park mobile application.

In order to analyze the quantitative data from the survey, we first reviewed and compiled all the data in Microsoft Excel using the export feature from Qualtrics. This provided our team with all the anonymous responses to our survey, and the question each response pertained to. The next step in our data analysis process was to identify and sort all 404 responses. This was a lengthy process and required lots of trial and error in order to classify the main needs among people. After various ways of sorting the data, we found the best way to classify people was to analyze common needs between age groups, disability and family type. After further analysis, we

created seven different personas which best encompassed the data we received. We then synthesized the data by classifying each response into the persona in which it was best represented by. To do this, seven separate excel sheets were created, one for each persona, and each response was moved to the excel sheet which best represented the response. The last step of our data analysis process was to develop findings. Each of the seven excel sheets were further analyzed to find the common needs in each group. These benefits were translated into the persona write ups to express what features they would be looking for in a mobile application. Table 2 represents the survey sample.

It was found that over 500 responses were recorded in favor of watching and/or playing sports during leisure time. This number of responses is higher than the 404 total survey responses since people had the liberty to respond to this particular question multiple times. Of those responses, 319 individuals tallied responses to watching these sports at home on a television, and/or 235 individuals responded they watched sports live and in a stadium. When asked to rank what makes these attendable events enjoyable, the majority of the number one rankings (most enjoyable) consisted of the social aspect, which would be classified as spending time with friends or family, and the passion geared toward the sport or activity. On the other hand, when asked to rank challenges during these events, the majority of the responses for the number one ranking (most challenging) was not having good value for the money spent and poor service quality that comes from either concession stands or ticket check-ins. Lastly, a staggering 95% of individuals responded that they would be willing to use a mobile application dedicated strictly to Polar Park.

Among the survey findings were the positive and negative experiences that individuals had when attending other ballgames. All of these responses were recorded in the fashion of an

open ended text box where users can type their answers in. For positive experiences, the most recurring words consisted of experience, fun, easy tickets, short lines, clean, price, affordable, and staff, access. The most recurring negative experiences were related to parking, expensiveness, restricted views, staff not controlling their out-of-control audiences, and long lines.

With that being said, two of the main app features that respondents wanted were related to parking and concession stands. In a broader sense, Figure 3 shows approximately 15% of respondents believed that a parking feature would be the most useful for a baseball stadium mobile application. The parking feature should show real time availability of parking spots, pricing, distance to the park, and location of the parking. Approximately 12.5% of the respondents thought mobile food, drink, and souvenir ordering would be one of the key features that would be most useful. In fact, people are willing to pay more for this feature with 28% of the respondent willing to pay two additional dollars for this feature, and 16% willing to pay three additional dollars. Other answers among the top five contenders are having a mobile ticket purchase and scan feature (~17%), a followable version of the team schedule (~15%), and a team roster with live statistics on individual players (~14%).

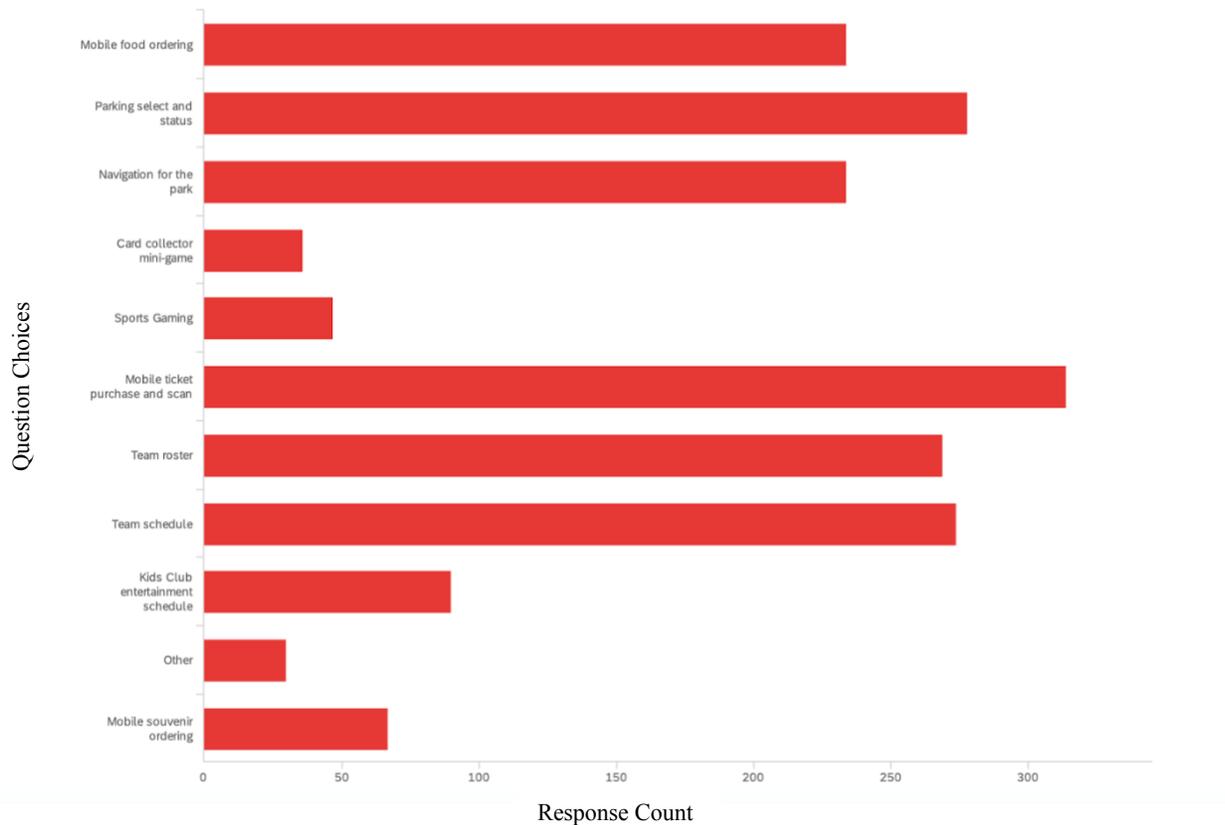


Figure 3: The most useful features in a ballpark mobile application

In addition, we also had a large pool of answers from audiences that needed accommodations. During our interview process, these individuals were the ones that felt like they aren't typically heard in a process like ours. We had an overwhelming number of answers in terms of the types of accommodations that can be provided ranging from larger fonts for visually impaired, larger restrooms and seating for those who have assistive devices, reducing line traffic, more handicap parking, specialized concession stand items, and the list goes on. The complete survey findings can be found in Appendix G.

Another recurring theme in the interviews, as well as the survey, was the concern for price. We know that baseball games aren't free, and we also know that individuals are going to be spending their hard earned money to attend these games. In fact, many of the working class

individuals that we interviewed expressed concern on the pricing of many of these features, and the overall experience. When asked to express their negative experiences with events in the past, or general concerns with the ballpark, a commonly expressed answer was the cost of attendance. For example, having mobile delivery of food to their seats would be sought after, but the pricing of it needs to be fair otherwise it won't be used. The underlying finding was that the application ought to give these users some sort of incentive aimed toward the more expensive aspects of the park. This includes parking, admissions, and potentially mobile ordering, all while still delivering a stellar experience.

From the demographic, psychographic, and behavioral data that we collected through this survey, seven personas of sports events attendees emerged. These personas are described in detail in the following section.

## ***Personas***

### *The Worcester Student: Jeffrey Davis*

I am Jeffrey Davis and I am a 21 year old student from Worcester Polytechnic Institute. I represent the student population (approximately 7% of survey responses). I really enjoy the social aspects that these baseball games bring to the table and often attend with friends close to my age. We will mostly be walking from WPI, but will occasionally use some rideshare applications like Uber and Lyft. I'm interested in having a mobile application that can make my life easier in attending a game. For one, I can't imagine a baseball stadium mobile application not having the ability to order a ticket from your phone! I've used SeatGeek, EventBrite, Stubhub, and Ticketmaster numerous times for the benefits of being able to see the stadium layout with and which deal rating each ticket is. Having a visual representation of how far away you'll be from the game is a lifesaver. Another really cool thing that I would like to see from a

mobile application is a section for sports betting or gambling. I think it would be really interesting to form a competitive environment that allows individuals to bet on their odds in order to get a payout of some sort.

I also think it is an absolute necessity for this mobile application to provide us with the ability to track the game and our favorite players in real time with statistics and streaming. This is a great way to allow myself and my fellow baseball fans to follow along with the game even when we're not present, and invest time into the team. Lastly, a feature that I think would be extremely beneficial to myself is the mobile ordering feature. I hate when I have to miss the game to wait in line for the concession stands. A mobile application that allows you to order food to the comfort of your seat is a life changing experience, and I would certainly be willing to pay for it. Keep me in my seat and let me fall in love with the game!

### *The Head of the Family: Joe Smith*

My name is Joe Smith, I am 36 years old, and I am married. We have two teenage boys and a baby girl. I represent the family population (approximately 8% of survey responses). My wife and I work very hard in order to provide for our family, so our main concern is that of price. I understand that businesses need money to function, but I can't seem to wrap my head around the idea that the same size soda is 5 dollars more than a corner store. For me, it's almost worth the walk to the corner store during the game to get a cheaper soda! It's only fair that if we are being moved to a digitalized experience, we should be rewarded for it. I would be really pleased to see that the Worcester Red Sox give out coupons or deals for downloading their app. I can tell you that I would love to use this app, and I would be more inclined to come back if this was the case. One of the biggest things that I have to consider when going out anywhere is that I need to take my family with me. As you can see, the price climbs incrementally in this case, so it's only

right that we get something in return! I would also like to see the Worcester Red Sox mobile application have a point system where the more I spend, the more rewards I get.

In addition to the price, parking is also largely a concern for me. With my baby girl still needing to be in a stroller, I'm not going to want to walk far (her patience can't handle that). Having the ability to see availability for parking in a mobile application alongside the distance from the stadium would be hugely beneficial. The patience level for kids is small, and oftentimes it gets frustrating for them when they are at an event for such a long period of time. I think a strong feature to incorporate into the application would be something that has the ability to entertain my kids! Baseball related trivia, card games, minigames, or location of nearby stadium-offered child events would be extremely beneficial to my wife and I. For my older boys, they love attending the promotional nights at the ballpark. Getting a stuffed animal, being able to meet the players, or having the ability to run the bases keeps them engaged in the game and wanting to come back. I would love to get notifications for these nights from the mobile application! This would further entice my family to buy tickets and attend the game. Also, I would love the ability to order souvenirs directly to our seat. I can't even begin to imagine the smile on my kids' faces when a staff member drops them off their favorite player's shirt! I would certainly be willing to pay for a feature like this, but the cost would not be worth the tradeoff if it exceeds \$5.

### *The Die Hard Fan: Angel Ortiz*

My name is Angel Ortiz, I am 58 years old, and I am a die-hard baseball fan! I represent the die-hard fans group (approximately 20% of the survey responses). I have been to numerous baseball games and plan to attend many more with the new Polar Park addition. I love the Red Sox and Paw Sox; you can always catch me at a game. After attending these games, it's very

easy to pinpoint the things that you don't like about particular stadiums. However, one thing stays the same: the love of the game. For me, a big frustration is the parking. Every time I go to an event, the parking is always a drag. For myself, I'm always interested in getting the best bang for the buck, but no team that I know of has a tool that shows you that. I would certainly be interested in a mobile application that has the ability to do that for me. I would like for it to show me available, and open parking spots that also make mention of the price. It would even be great if I could buy my ticket before even getting to the park! If my spot was reserved, and paid for ahead of time, I could plug the specific location of the spot into my navigation and eliminate the confusion once at the park. I also find it extremely frustrating waiting in lines at the concession stands. The most enjoyable part of the experience for me is how fast-paced the event is, so missing the game to wait in a massive line is extremely frustrating. Having the ability to order something to my seat from the same app that I used for parking would definitely be put to good use and I would definitely pay extra for this feature.

Now that we're on the topic of using the same application for ballpark related frustrations. I think it is essential for the same application to hold parking, ticket, and concession related features. It's super frustrating to have a phone full of mobile applications with each one of them serving a different purpose. On that note, I would be happy to see that in this same mobile application would be a place where the team schedule is located and the roster that has the player statistics on it. This would be great to use when I want to follow along with the games that I unfortunately will miss. Another really cool feature that would appeal to the gaming side of me is gaming of some sort. It would be really neat to see a card-collecting/trading minigame that might result in some specialty game cards!

### *The Single Worker: Alexandra White*

My name is Alexandra White, I am 42 years old, and I am currently living and working in Worcester. I represent the single working class and am responsible for approximately 5% of the data recorded. Because I spend so much of my time working, and I don't have a significant other, I find most of my enjoyment at these events to be the social aspect of it all. There's nothing better than going out to a game with my best friends and having food and drinks while enjoying something that we don't typically get to enjoy.

One aspect of a mobile application that would be important to me is having access to the park layout and bus schedule. Since I live and work in Worcester, I usually walk, or take public transportation around the city. Since I do not have a car, it would be extremely useful to have the Worcester Regional Transit Authority Schedule posted on the mobile application so I can ensure that the bus will get me there for game time. If the mobile application could show me the bus stop so I know exactly where I am when I get off the bus that would be so helpful.

When using this mobile application, I would also love the ability to see the team statistics! Next, I want the ability to order items directly from the application and get them delivered to the seat, even if it means paying extra. When I'm out with friends, I don't want to waste our precious time waiting in lines. Lastly, I would love to receive notifications for promotional nights for a "friends-night-out," where I would be able to let loose a little bit! I am always on social media, posting updates on Instagram and Facebook, and would love to see a picture of me and my friends posted on the Jumbotron, especially for someone's birthday. It would be awesome if I could order a surprise message for a friend from the app and see it on the screen too!

### *The Empty Nester: Patricia DeMaury*

My name is Patricia DeMaury, and I am 68 years old. I represent the empty nesters group (approximately 12% of the survey responses). After my kids left home, my husband and I found pleasure in watching television or taking walks around the neighborhood. We occasionally find ourselves taking a trip to sporting events since we grew up loving baseball. However, we do have some gripes that make us weary to go again. For one, the ticket purchase needs to be smooth. A few years ago, we used to get our tickets from Ticketmaster since they were widely sponsored, but we would have to print them out. Trying to save those tickets for a memory token was next to impossible. I can't stress the importance of a fluid ticket purchase and scan inside of a mobile application enough. I have been forced to adapt to smart phones, and now that I know how to work it efficiently, I see this as a huge selling point.

Another difficulty is navigating the park. It is just way too hard in today's day and age. From the games that I have been to, I couldn't tell you where the nearest bathroom was, nevertheless the nearest concession stand. It would be really beneficial for the application to have a map layout of concession stands and bathrooms in relation to the seating arrangements. If I need to wander around the stadium, I ought to at least have the ability to find where I'm going in a timely fashion! In addition to this, my husband and I enjoy going out to eat after a game and turning it into a date-night of sorts, so it would be nice to also see a list of nearby restaurants. If we could reserve our table from the mobile application, that would help relieve the stress of trying to perfectly time our reservation.

My last requirement is that the app have some form of commentary, or description of the game. Growing up, my father would always listen to the Dodgers on the radio, and nothing beats the feeling of the excitement from these commentators. This would allow us to listen to the game in the car or sitting at home when the weather isn't as nice. Their profession is something that

goes unnoticed for me, and I would love for this app to have a live broadcast of that commentating, or even a captionized version of it! Especially now that my hearing is starting to go, this would help keep me young!

### *The Physically Challenged: Susan M. Hillard*

I am Susan Margaret Hillard, age 63, and I represent the differently-abled population, (about 7% of the survey responses). I have suffered from mild arthritis for 3 years now, and my disability causes me to live a life that is different, and so the benefits I am seeking from a mobile stadium application are according to that lifestyle with certain experiences. Even though the physical accommodations that I need from the layout and practicality of the park, there are additional ways I could benefit from a mobile application. For one, it would be nice to know the location of the physical accommodations in the application. I like to plan ahead, so knowing where there will be elevators, shade, or where my service dog can relieve himself would be crucial for me. I think having a virtual tour of the park layout showing exact bathroom and concession stand locations would be very useful to not only the disabled community but all park guests. It would also be critical to include not only navigation for the park, but handicap-friendly routes with a mapping for concession stands, seating, and bathrooms. Aside from these things, the other benefit I seek from this mobile application is to have an easy to read menu on the application for concession stand items.

### *The Caretaker: Barbara West*

My name is Barbara West and my son is Matthew West. He is 24 years old and I am his primary caretaker. Matthew represents the intellectually disabled and make up for approximately 10% of the data found. Matthew is on the autism spectrum and is nonverbal. I love to get him out of the house and he really enjoys sporting events. We are looking forward to attending the

Worcester Red Sox games. One thing that is extremely important to our family is making sure locations are accessible for Matthew. He struggles when walking on uneven surfaces and cannot make it through the tight rows of the bleachers. A mobile application that shows us the layout of the park will be extremely helpful for me so I can plan our route to the game. Matthew also struggles with loud noises so if the application could tell me where I can access quiet locations that would be great. Also, Matthew has a skin condition where he will burn if exposed to the sun for more than five minutes. This prevents us from doing lots of outdoor activities, so having the application tell us how the sun sets in the park so we can find the best locations to sit would be so helpful. Finally, if there was an option for the mobile application to purchase premium seating, with extra comfortable seats or added cushion pads, that would help keep Matthew in his seat and focused on the game.

### ***Additional Findings***

After creating the personas that represent the different mobile application user types, there are a few ancillary findings. Some additional ideas for the mobile application that are not encompassed by one specific persona include seating upgrades and food options.

Since we recommend that the mobile application has ticket purchasing, we believe it is important to have some benefits available with this feature. For one, people should be able to return their ticket or sell it to a friend if they can no longer attend the game. People expressed that with current ticket purchasing applications, refunds are sometimes not available, which is very frustrating for the user. Survey takers also expressed the desire for seating upgrades. Once people arrive at the park and see their seat, they may want to consider moving to a better location closer to the players or out of the sun. Having a way for fans to upgrade their seat at the park would be highly desired by some potential users of this mobile application.

Finally, our team has found that people have expressed the want for a variety of food options at the park. Nowadays, people have many dietary restrictions and food preferences. People want to enjoy food at the park but are not sure if they will have the necessary food accommodations available. Having the full menu on the mobile application, expressing all food options, including gluten free, vegan, vegetarian, and keto options, would be very useful.

## Future Research

In this project, we collected data from the final consumers in order to provide information for a Business-to-Consumers (B2C) strategy. For the future, we also recommend the Worcester Red Sox gathering data for a Business-to-Business (B2B) strategy. Since Polar Park is being developed in the heart of Kelley Square, there is a great opportunity for the company to research potential Business-to-Business market segments who could buy the tickets in bulk for their employees or clients. For example, universities could buy tickets in bulk for alumni reunion at the game, or human resource managers of companies could book tickets in bulk for an employee networking event, and so on.

Furthermore, there is a great opportunity to have strategic collaborations with businesses around Polar Park. In order to complete this research, our team recommends conducting interviews with businesses in Kelley Square and in the surrounding Worcester areas. During these interviews, it would be important to see how the company thinks having the park will affect their business, and any promotions they plan to hold during games or events. Our team also suggests for the Worcester Red Sox to target local restaurants and takeout spots. Some that we recommend targeting include: Kelley Square Pizza, SmokeStack Urban Barbeque, The Banner Bar and Grille, The Hangover Pub, Insomnia Cookies, Table Talk Pies, Wings Over Worcester and Birch Tree Bread Company. To form a bond with these restaurants, the Worcester Red Sox could investigate potential partnerships or promotions between them. This may include reserving a table for the restaurant through the mobile application for when the game ends, so customers don't have to leave the game early to make their reservation or including deals like 10% off if you show your ticket on the mobile application. With new hotels and businesses

popping up in the area, we would also recommend the Worcester Red Sox to target these businesses to see if there are any partnerships that can be formed.

Another thing we recommend the Worcester Red Sox look into is the Kids Club. Many parents would like to see an additional way for their children to be entertained during the ball game. Having a place to bring the kids for an inning or two can break up the game and help keep the kids engaged. Having a feature in the mobile application that allows parents to see what activities are going on at the Kids Club each inning would provide parents with a way to schedule their time at the ballpark. We would recommend the Worcester Red Sox to further investigate the interest parents have in this feature. To do so, it would be beneficial to create a survey or brief interview targeted specifically at parents of children. In this questionnaire, it would be important to ask how many children they have, the ages of the children interested in the Kids Club, what activities their children would like to see in the Kids Club, and how much (if any) they are willing to pay for this feature. It would also be important to see if parents would want to stay with their children at the Kids Club or if they would plan on dropping the children off. This is important to figure out since the Kids Club would need to be well staffed if parents plan on leaving their children unsupervised.

Overall, additional research can be conducted to help continue and make this mobile application the most innovative mobile application in ballpark history. With that being said, as the park opens, it would be very important to conduct an additional survey about the features the mobile application currently provides. This will help the Worcester Red Sox understand what features have proven to be beneficial to the mobile application users and which features can be removed or improved further.

## Conclusion

All in all, our team was able to discover underlying issues that consumers face or might face when going to a large-scale event like that of Polar Park. Whether this be missing the game, not having adequate social aspects, or lack of physical accommodations. Despite our focus being on how a mobile application can improve the customer journey, we were able to determine some structural changes that would be beneficial as well. Our group was able to conduct a total of 16 interviews in order to craft a survey that was completed by 404 individuals in just two days. The amount of feedback that was received was overwhelming, and it certainly gave us all that we needed in order to develop the personas. Our team can confidently say that we have proposed ideas here that have the ability to make one of the best baseball stadium mobile applications of all time. We believe that if the personas above are heard and their ideas are executed, the Worcester Red Sox sponsor team has the ability to make a break-through in setting the standard for all other stadium applications. In addition, they have the ability to implement an application to provide the best possible user experience as well as generate foot traffic from these loyal customers.

## References

- Abduljalil, S. & Kang, D. (2011). Analysis of human factors in software application design for effective user experience. *Institute of Electrical and Electronics Engineers*. Paper presented at the 13th International Conference on Advanced Communication Technology, Seoul, South Korea. <https://ieeexplore.ieee.org/document/5746077>
- Albaum, G., & Hawkins, D. I. (1983). Geographic mobility and demographic and socioeconomic market segmentation. *Journal of the Academy of Marketing Science*. 11(1), 97-113. <http://ezproxy.wpi.edu/login?url=https://search-proquest-com.ezpxy-web-p-u01.wpi.edu/docview/211228329?accountid=29120>
- Arkenberg, C., Deweese, C., & Giorgio, P. (2019). *Redesigning stadiums for a better fan experience*. Deloitte. <https://www2.deloitte.com/us/en/insights/industry/telecommunications/in-stadium-fan-experience.html>
- Barnhoorn, J.S., Haasnoot, E., Bocanegra, B.R., & Steenbergen H. (2015). QRTEngine: An easy solution for running online reaction time experiments using Qualtrics. *Behavior Research Methods*. 47, 918–929. <https://doi.org/10.3758/s13428-014-0530-7>
- Blackstone, A. (2012). *Principles of sociological inquiry: Qualitative and quantitative methods*. Saylor Foundation.
- Brickey, J, Walczak, S, & Burgess, T. (2010). A comparative analysis of persona clustering methods. *Americas Conference on Information Systems (AMCIS)*. Paper presented at the Proceedings of the Sixteenth Americas Conference on Information Systems, Lima, Peru. <https://pdfs.semanticscholar.org/ba42/70874e8bee803385a0ea8a2264a31318554b.pdf>
- Coorevits L, Schuurman, D, Oelbrandt, K, & Logghe, S. (2016). Bringing Personas to Life: User Experience Design through Interactive Coupled Open Innovation. *Persona Studies* 2(1), 97-114. DOI:10.21153/ps2016vol2no1art534
- Chen. W. (2018). User experience design and its application in mobile phone design. *IOP Conference Series: Materials Science and Engineering*. Paper presented at 6th Annual International Conference on Material Science and Engineering, Jiangsu, China. <https://iopscience.iop.org/article/10.1088/1757-899X/397/1/012067>
- Data USA. (2017). *Worcester, MA*. <https://datausa.io/profile/geo/worcester-ma/>
- DeCosta-Klipa, N. (2018, August 20). *So, the PawSox are officially moving to Worcester. Here's what we know about the move so far*. Boston. <https://www.boston.com/news/local-news/2018/08/20/pawsox-worcester>

- Desimone, L. M., & Le Floch, K. C. (2004, Spring). Are We Asking the Right Questions? Using Cognitive Interviews to Improve Surveys in Education Research. *Educational Evaluation and Policy Analysis*. 26(1), 1-22.  
<https://journals-sagepub-com.ezpxy-web-p-u01.wpi.edu/doi/pdf/10.3102/01623737026001001>
- Dong, X., Tu, N., Rau, P. P., & Zhang, T. (2010). Using cluster analysis in persona development. *Institute of Electrical and Electronics Engineers*. Paper presented at the 8th International Conference on Supply Chain Management and Information, Hong Kong, (p.1-  
<https://ieeexplore.ieee.org/document/5681684>
- Easwaramoorthy M, & Zarinpoush, F. (2006). Interviewing for Research. *Canada Volunteerism Initiative*.  
[http://sectorsource.ca/sites/default/files/resources/files/tipsheet6\\_interviewing\\_for\\_research\\_en\\_0.pdf](http://sectorsource.ca/sites/default/files/resources/files/tipsheet6_interviewing_for_research_en_0.pdf)
- Glaun, D. (2018). *A tentative deal reached: Pawtucket Red Sox plan to move to Worcester*. Masslive.  
[https://www.masslive.com/news/worcester/2018/08/pawsox\\_to\\_move\\_to\\_worcester.html](https://www.masslive.com/news/worcester/2018/08/pawsox_to_move_to_worcester.html)
- Hanlon, A.(2019). *The segmentation, targeting and positioning model*. Smart Insights.  
<https://www.smartinsights.com/digital-marketing-strategy/customer-segmentation-targeting/segmentation-targeting-and-positioning/>
- Hanson, M. (2018). *The Worcester Red Sox plan includes a \$86 million ballpark but won't increase your tax rate; How is that possible?* Masslive.  
<https://www.masslive.com/news/erry-2018/08/299b55e8d58252/the-worcester-red-sox-plan-inc.html>
- Payments News & Mobile Payments Trends, Consumer Payments News, Financial Technology News. (2019). *How FanFood Brings Mobile Ordering to Sports and Concerts*.  
<https://www.pymnts.com/mobile-order-ahead/2019/how-fanfood-brings-mobile-ordering-sports-concerts/>
- Hopps, J. (N.D). *Target Market Selection Segmentation and Positioning*. Demand Metric.  
<https://blog.demandmetric.com/2008/08/06/target-market-selection-segmentation-and-positioning>
- Humphrey, A. (2017). User Personas and Social Media Profiles. *Persona Studies*. 3(2), 13-20.  
DOI:10.21153/ps2017vol3no2art708
- Jones, T., Baxter, M., & Khanduja V. (2013). A quick guide to survey research. *Annals of The Royal College of Surgeons of England*. 95(1), 5-7.  
DOI: 10.1308/003588413X13511609956372

- Kirchherr, J., & Charles, K. (2018). Enhancing the sample diversity of snowball samples: Recommendations from a research project on anti-dam movements in Southeast Asia. *PloS one*, 13(8). <https://doi.org/10.1371/journal.pone.0201710>
- Lemon, K. N., & Verhoef, P. C. (2016). Understanding Customer Experience Throughout the Customer Journey. *Journal of Marketing*, 80(6), 69-96. <https://doi.org/10.1509/jm.15.0420>
- Lune, H., & Berg, B. L. (2018). *Qualitative research methods for the social sciences*. Boston: Pearson.
- Nestel, D., Ivkovic, A., Hill, R., Warrens, A., Paraskevas, P., McDonnell, J., ... Browne, C. (2012). Benefits and challenges of focus groups in the evaluation of a new Graduate Entry Medical Programme. *Assessment & Evaluation in Higher Education*, 37(1), 1–17. <https://doi.org/10.1080/02602938.2010.494232>
- O'Connor, K. (2011). *Personas: The Foundation of a Great User Experience*. UX Magazine. <https://uxmag.com/articles/personas-the-foundation-of-a-great-user-experience>
- O'Grady, J. D. (2013). *iBeacons: Coming soon to a baseball stadium near you*. ZD Net. <https://www.zdnet.com/article/ibeacons-coming-soon-to-a-baseball-stadium-near-you/>
- Rovell, D. (2018). *Cowboys dump Ticketmaster in favor of deal with SeatGeek*. ESPN. [https://www.espn.com/nfl/story/\\_/id/23013935/dallas-cowboys-dump-ticketmaster-favor-seatgeek](https://www.espn.com/nfl/story/_/id/23013935/dallas-cowboys-dump-ticketmaster-favor-seatgeek)
- Usability.gov. (N.D). *Personas*. <https://www.usability.gov/how-to-and-tools/methods/personas.html>
- Villanueva M. R. P., & Chohan R. (2018). Conversion Theory in Marketing. *Back to the Future: Using Marketing Basics to Provide Customer Value*. p. 415-425 [https://doi.org/10.1007/978-3-319-66023-3\\_145](https://doi.org/10.1007/978-3-319-66023-3_145)
- Wilson, C. (2014). *Interview techniques for UX practitioners : a user-centered design method*. Waltham, MA: Morgan Kaufmann.
- Worcester Polytechnic Institute (2019). *Worcester Polytechnic Institute Teams Up With Worcester Red Sox to Create a 21st Century Ballpark*. <https://www.wpi.edu/news/worcester-polytechnic-institute-teams-worcester-red-sox-create-21st-century-ballpark>
- Wright, R. (2018). Targeting, segmenting and positioning the market for college students to increase customer satisfaction and overall performance. *College Student Journal*, 42(3). <https://www.questia.com/library/journal/1G1-182975283/targeting-segmenting-and-positioning-the-market-for>

Yu, H., Chou, C. & Luh, D. (2018). The design application of behavior observation to the user's experience drop. *Institute of Electrical and Electronics Engineers*. Paper presented at the IEEE International Conference on Applied System Invention. ftab  
<https://ieeexplore.ieee.org/document/8394352>

## Tables

***Table 1: Sample Description of Interview Participants***

<b>Location</b>	<b>Age (years)</b>	<b>Gender Identity</b>	<b>Occupation</b>	<b>Marital Status</b>	<b>Persona Type Classification</b>
Worcester	47	Female	City Worker for Human Services	Single	Physically Challenged
Worcester	70	Male	Retired	N/A	Physically Challenged
Pawtucket	20	Male	Student	Single	Worcester Student
Worcester	46	Female	College Food Services	Married	Head of the Family
Boston	33	Male	Supervisor	Married	Head of the Family
Worcester	21	Female	Student	Single	Worcester Student
Hubbardston	55	Female	Head of Physical Education	Married	Empty Nester
Boston	37	Female	Banker	Married	Head of the Family
Worcester	24	Male	Engineering consultant	Single	Single Worker
New Jersey	24	Male	Student	Single	Worcester Student
N/A	22	Male	Work from home	Single	Single Worker
Hubbardston	70	Male	Physical Education instructor	Married	Empty Nester
Fitchburg	21	Female	Student	Single	Worcester Student
Worcester	48	Female	Executive Director	Married	Physically Challenged
Worcester	N/A	Male	Magician	Married	Empty Nester
Worcester	58	Female	Lawyer	Married	Physically Challenged

**Table 2: Sample Description of Survey Respondents**

Average Age = 66 years		Gender Identification		Ethnicity		Marital Status	
# Of People	Age Group (years)	# Of People	Gender Identification	# Of People	Ethnicity	# Of People	Marital Status
60	18-29	236	Male	3	Black / African American	252	Married/ Living with a partner
98	30-39	159	Female	5	Asian	4	Engaged
47	40-49	9	Other/ Prefer not to answer	3	American Indian or Alaska Native	30	Divorced
73	50-59			16	Hispanic / Latino(a)	1	Separated
73	60-69			349	White / Caucasian	7	Widowed
46	70+			28	Other/ Prefer not to answer	105	Single
7	Other/ Prefer not to answer					5	Other/ Prefer not to answer

Education		Occupation Status		Disability Status	
# Of People	Education Status	# Of People	Occupation Status	# Of People	Disability Status
11	Other/ Prefer not to answer	271	Employed	69	Disabled
37	Associate degree	103	Unemployed	335	Not disabled
130	Bachelor's (BA, BS, AB, etc.)	30	Student		
100	Graduate degree (MA, MA, MBA, PhD, EdD, etc.)				
36	High School graduate or equivalent				
15	Professional degree (MD, JD, etc.)				
75	Some College, no degree				

# Appendices

## *Appendix A. Interview Protocol*

Hi,

We are students from Worcester Polytechnic Institute working side-by-side with the Worcester Red Sox in order to ultimately create a mobile application for Polar Park. This is to be done in a multi-step process, where we are responsible for the first. You are here because we are collecting data on the general Massachusetts population from various areas in order to form personas, which gives us characteristics that can later be grouped. These personas are supposed to give us the information necessary in order to personalize a survey that will be handed out on a wider scale to determine necessities for the mobile application. Ultimately, these necessities will be converted into a full-blown application that is to be created by another team at WPI.

The Worcester Red Sox is a professional Minor League Baseball team that is scheduled to begin to play in 2021. They were recently known as the Pawtucket Red Sox until their recent relocation into the Canal District of Worcester. The team is a Triple-A affiliate of the Boston Red Sox and will house potential future MLB stars!

I would just like to make sure that you received the consent form that was sent via email. Are you still willing to participate?

First and foremost, our team would like to thank you for taking the time out of your day to answer the questions we have put together. In the midst of an unprecedented event, we know how tough it is adjusting to a completely different life.

### **Demographics**

- Can you tell us a little bit about yourself?

**Probing Questions** – used as a checklist to ensure all topics are covered

- **Age**
- **Gender**
- **Education**
- **Occupation**
- **Marital Status**
- **Kids**
- **Ethnicity**

### **Psychographic Concept 1 - Work Life**

- Can you tell us a little bit more about your work life?

### **Probing Questions - if not answered by above question**

- What do you do for a living?
- Hours
- Job Role
- Years of work experience
- Any career shifts?

### **Psychographic Concept 2 - Leisure Time**

- Can you tell us about what you do in your leisure time?

#### **Probing Question - if not answered by above question**

- Hobbies/ Interests
- How do these hobbies/interests add value to your life in general?
- How much time do you spend on these leisure activities?
- Are you willing to spend money for these leisure activities?
- Do you do these activities individually, as a family, and/or with friends or coworkers?
- If they talk about sports over here, ask the next list of questions.
- If they do not talk about sports, ask specifically if they are interested in any sport?

### **History Probing Questions**

- Do you/did you play any sport?
  - If they say NO, ask if they watch sports?
  - If they say YES, ask the following questions:
    - What was the highest level at which you played this sport?
- How much time do you invest in this sporting activity every week?
- How much do you spend on average on this sporting activity on an annual basis?
- Who all are involved in this sporting activity?

### **Televised/Attend-able Entertainment**

- Can you tell us about what types of televised or attend-able events you currently enjoy and how you do so? That is, you might participate in, or watch, different sports. Or do both.
  - For example: you might be fond of the entertainment type of Wrestling and it might not always be offered at a nearby center, so you follow on TV.

- What other kinds of entertainment do you enjoy? Music performance or concerts, or other activities?
- A few types of entertainment for reference
  - Concerts
  - Movies
  - Sporting Events
  - Museums
  - Art shows
  - Other

**(Sporting) Experience:**

- Can you tell us more about the history and experiences you've had with these types of entertainment?

**Probing Questions**

- How many times have you attended entertainment events in the past year?
  - 0
  - 1-2
  - 2-6
  - 7-15
  - 16+
- Which events?
- How much do you spend on these entertainment events?
- What do you enjoy about these events?
- What do you dislike about these events?
- Have you seen mobile applications in these events? If so, can you please describe them?
- Do you have any positive or negative experiences with these events?
- What is the maximum distance you would be willing to travel for a sporting event?

*If the interviewee has not mentioned they have been to a sporting complex with the above (probing) questions:*

- Have you been to sporting complexes or stadiums?
  - If yes
    - Which ones?
    - What did you like about these stadiums? You can tell us about each one of them.
  - What are some key factors that might keep you from going to a game?

- What is the most frustrating thing you have faced at a major event?
- How would you like to resolve it?
- How do you feel about having the ability to order food or souvenirs through a mobile application in an event like this?
- If not:
  - What do you think would **make** you want to go to a game?
- What do you think about a tiered parking system? That is, paying a higher dollar for proximity?
- What are some other factors that might keep you coming to these events? Is it the experience, or is it performance? Both? Do you mind elaborating further?

### **Technical Behavioral Information:**

- Would you be able to tell us more about your internet and phone usage? This includes mobile phone, social media, online shopping, etc. Let's start with phone.

### **Probing Questions**

- What do you use your phone for?
- What kind of a phone do you have?
- Do you have a data plan on your phone?
- Mobile phone service provider?
- How much time do you spend on your phone each day – talking to others, texting, surfing the web, etc....?
- What mobile apps do you use frequently?
- Have you used parking applications before?
- Do you shop using your mobile phone? Why or Why not?
- Which mobile apps you shop on?
- What do you love about shopping on your mobile phone?
- What are your frustrations about shopping on mobile phone?
- How do you pay for shopping you do on your mobile phone?
- Do you buy branded goods? Why or why not?
- What are your favorite brands?

Let's move on to internet and email.

- Do you own a laptop/desktop? Which one? How much time you spend on it daily? What do you use your laptop/desktop for?

- Do you have access to internet – at home and at work?
- How many times a day do you check your email – personal and work?
- Now let's chat about your social media usage and presence.
- Are you present on any social media platforms?
  - Yes
  - No

If yes:

- What do you use social media for?
- How many times a day do you check social media? Using which device (laptop, smartphone, etc.)?
  - 0-1
  - 2-4
  - 5-7
  - 8-10
  - 10+
- Which platforms?
- Approximately how many followers do you have on each mentioned platform?
- Approximately how often do you post on each mentioned platform?
- Now let's talk about your online shopping experience.
- Do you make purchases online?
  - Yes
  - No

If Yes:

- What types of purchases?
- How often?
- What do you prefer?
- What applications do you online shop on?
- How do you pay for online purchases?
- What is it that you love about online shopping?
- What are your online shopping frustrations?
- What are your favorite online shopping sites? Why?

Now let's talk about other media such as television and radio.

- Do you own a television? Which one?
- Do you listen to radio? Which one?
- How much time do you spend watching tv daily?
- How much time do you spend listening to radio daily?
- Do you use cable? Why? Or Why not?
- If yes, which channels do you watch the most? What are your favorite shows on TV?
- If not, how do you watch your television shows (Netflix, Hulu, etc....)?

- What are your favorite programs on radio?

### **Sports Gaming**

- What types of sports gaming have you experienced?
- What do you particularly enjoy about them?
- Would you be interested in engaging with a gaming application for a sporting event?

### **Red Sox Fans – Regular Worcester Red Sox (or Fenway) attendees, not for general public**

- How many games do you plan on going to in a Worcester Red Sox season?
- How many Boston Red Sox games have you gone to in the past year, or will you go to this upcoming year?
- How many other people do you typically bring or plan on bringing to a game?
- What age-groups does your party consist of?
- What is the best mode of transportation for you when getting to Polar Park?
- How long is your expected travel time to Polar Park?
- What is the maximum distance you will travel to get to a baseball game?
- What route do you plan on taking to the park?
- Do you have a smartphone?
- What kind of features do you think would be most useful in a baseball stadium application?
- How confident in your ability do you feel in navigating an app of this magnitude?
- What do you think about a tiered parking system? That is, paying a higher dollar for proximity?
- What do you think is the most frustrating part of going to a baseball game?

## ***Appendix B. Supplemental Interview Protocol for Individuals with Disabilities***

\*This supplemental interview will be added to the interview in Appendix A for people with disabilities

We understand that talking about physical challenges may be very uncomfortable. With that being said, elaborating on your challenges will greatly help us understand how to recommend better adaptations for people with disabilities, or needing accommodations, in the new Polar Park. If you ever feel uncomfortable please let us know, and we can skip the question or end the interview.

### **Individuals with Disabilities:**

- **Tell us about yourself?**

### **Probing Question:**

- **If you feel comfortable, can you please describe your disability and how it affects your daily life?**
- **What challenges do you face, specifically when in public settings?**
- **Do you attend sports events? If yes, what type of accommodations would you expect in a ballpark or stadium? Are these accommodations usually available? If not, Why not? What are the challenges?**
- **Are there any specific technologies you use to help you in your daily life?**
  - What applications do you use?
  - How often?
- **Do you own and use a smartphone? What apps do you use?**
- **What specific features would be beneficial to you in a ballpark app to help you at a sports event?**

## *Appendix C. Consent Form*

### **Informed Consent Agreement for Participation in a Research Study**

**Investigators:** Billy Duulal, Abby O’Sullivan, Jerry Perez, Professor Sarah Strauss, and Professor Purvi Shah.

**Contact Information:** Billy Duulal - bduulal@wpi.edu, Abby O’Sullivan - arosullivan@wpi.edu, Jerry Perez - jperez2@wpi.edu, Professor Sarah Strauss sstrauss@wpi.edu, and Professor Purvi Shah pshah@wpi.edu.

**Title of Research Study:** Worcester Red Sox - Persona Development to Represent the Worcester Fan Base Demographics

**Sponsor:** Worcester Red Sox

**Introduction:** You are being asked to participate in a research study. Before you agree, however, you must be fully informed about the purpose of the study, the procedures to be followed, and any benefits, risks or discomfort that you may experience as a result of your participation. This form presents information about the study so that you may make a fully informed decision regarding your participation.

**Purpose of the study:** The purpose of this study is to collect information from the Worcester public to gauge their interest and desired benefits for a mobile application to be used when attending a Worcester Red Sox game. The results of these interviews and surveys will be analyzed and compared to make personas, fictional characters that represent user types. These personas will be presented to the Worcester Red Sox team in order to facilitate the development of a mobile application.

**Procedures to be followed:** As a subject in our study, you will either be completing an interview or survey. For people participating in an interview, you will anonymously provide information based on the questions being asked. For people participating in a survey, you will be required to anonymously fill out a survey sent to them virtually via a link to the Qualtrics site.

**Risks to study participants:** Subjects may feel bored when participating in the interview or survey. Some personal information in this study, including psychographic, demographic and behavioral information, may cause participants to feel uncomfortable. Participants with disabilities may also feel uncomfortable by questions asked in this study.

**Benefits to research participants and others:** Participating in this study will help the Worcester Red Sox develop a mobile application that will best suit the users. Participating in this survey may also inspire application features to give the users all desired benefits. Participants with disabilities can further help the Worcester Red Sox by giving the team a perspective of a disabled person and what kind of accommodations will be necessary.

**Informed consent process:** The investigators will ask the participants to read and sign the informed consent form before any participation in the study. Additionally, investigators will explain any risks concerned with the study and the participant’s right to withdraw from the study at any time. If any questions should arrive, the investigators will spend as much as time needed

to explain and respond to subject's questions. The principal investigator will retain all of the signed informed consent agreements in a secure location for a minimum of three years.

**Record keeping and confidentiality:** The information given during these studies will remain completely anonymous. The WPI students completing this study, their professor advisors and the Worcester Red Sox company will also have access to records. These may include audio recordings, or video recordings from your interviews. Records of your participation in this study will be held confidential so far as permitted by law. However, the study investigators, the sponsor or it's designer and, under certain circumstances, the Worcester Polytechnic Institute Institutional Review Board (WPI IRB) will be able to inspect and have access to confidential data that identify you by name. Any publication or presentation of the data will not identify you."

**Compensation or treatment in the event of an injury:** You do not give up any of your legal rights by signing this statement. There will be no harm if subjects decide not to participate.

**For more information about this research or about the rights of research participants, or in case of research-related injury, contact:** The investigators at the top of this page, or IRB Manager (Ruth McKeogh, Tel. 508 831- 6699, Email: irb@wpi.edu) or the Human Protection Administrator (Gabriel Johnson, Tel. 508-831-4989, Email: gjohnson@wpi.edu).

**Your participation in this research is voluntary.** Your refusal to participate will not result in any penalty to you or any loss of benefits to which you may otherwise be entitled. You may decide to stop participating in the research at any time without penalty or loss of other benefits. The project investigators retain the right to cancel or postpone the experimental procedures at any time they see fit.

**By signing below,** you acknowledge that you have been informed about and consent to be a participant in the study described above. By signing, you also give consent to have the interview audio recorded. Make sure that your questions are answered to your satisfaction before signing. You are entitled to retain a copy of this consent agreement.

Study Participant Signature

\_\_\_\_\_

Study Participant Name (Please print)

\_\_\_\_\_

Date: \_\_\_\_\_

Signature of Person who explained this study

Date: \_\_\_\_\_

Consent for audio/visual recording:

## ***Appendix D. Disabled Participants' Consent Form***

The following consent form will be read to the subject to ensure total understanding of what they are agreeing to participate in.

Hi,

Thank you so much for agreeing to participate in our study. The information gathered from this interview will be used to help understand different benefits and accommodations people would like to see implemented into the new Polar Park. Our project is sponsored by the Worcester Red Sox in order to create a number of personas to represent the Worcester fan base. The people investigating this study are Billy Duulal, Abby O'Sullivan, Jerry Perez, WPI Professor Sarah Strauss, and WPI Professor Purvi Shah.

**Contact Information:** Billy Duulal - bduulal@wpi.edu, Abby O'Sullivan - arosullivan@wpi.edu, Jerry Perez - jperez2@wpi.edu, Professor Sarah Strauss sstrauss@wpi.edu, and Professor Purvi Shah pshah@wpi.edu.

Participating in our research study allows us to collect information from the Worcester public to gauge interest and desired benefits for a mobile application to be used when attending a Worcester Red Sox game. The results of this interview will be analyzed and compared with other interviews to make personas, fictional characters that represent user types. These personas will be presented to the Worcester Red Sox team in order to facilitate the development of a mobile application. As a subject in our study, you will be interviewed anonymously to provide information based on the questions being asked.

As a participant in this study you may be at risk due to boredom or discomfort when answering questions. Some personal information in this study, including psychographic, demographic and behavioral information may cause you to feel uncomfortable as well. At any point during this interview if you feel uncomfortable or want to stop, we can with no consequences. Your safety and comfort is our number one priority.

Participating in this study will help benefit the Worcester Red Sox by helping them develop a mobile application that will best suit the users. Participating in this survey may also inspire application features to give the users all desired benefits. Another benefit is helping the Worcester Red Sox understand specific accommodations that could be made to the mobile application to better the user experience.

You will be read the consent form and sign the informed consent form, before any participation in the study. If any questions should arise, the investigators will spend as much time as needed to explain and respond to your questions. The principal investigator will retain all of the signed informed consent agreements in a secure location for a minimum of three years.

The information collected during these studies will remain completely anonymous. The WPI students completing this study, their professor advisors and the Worcester Red Sox company will also have access to records. These may include audio recordings, or video recordings from your interviews. Records of your participation in this study will be held confidential so far as

permitted by law. However, the study investigators, the sponsor or its designer and, under certain circumstances, the Worcester Polytechnic Institute Institutional Review Board (WPI IRB) will be able to inspect and have access to confidential data that identify you by name. Any publication or presentation of the data will not identify you.”

Participants do not give up any of their legal rights by signing this statement. There will be no harm if subjects decide not to participate.

**For more information about this research or about the rights of research participants, or in case of research-related injury, contact:** The investigators previously mentioned, or IRB Manager (Ruth McKeogh, Tel. 508 831- 6699, Email: irb@wpi.edu) or the Human Protection Administrator (Gabriel Johnson, Tel. 508-831-4989, Email: gjohnson@wpi.edu).

Participating in our research is voluntary. Your refusal to participate will not result in any penalty to you or any loss of benefits to which you may otherwise be entitled. You may decide to stop participating in the research at any time without penalty or loss of other benefits. The project investigators retain the right to cancel or postpone the experimental procedures at any time they see fit.

By signing below, you acknowledge that you have been informed about and consent to be a participant in the study described above. By signing, you also give consent to have the interview audio recorded. Make sure that your questions are answered to your satisfaction before signing. You are entitled to retain a copy of this consent agreement.

Do you want to participate in this study?

Study Participant Signature

\_\_\_\_\_

Study Participant Name (Please print)

\_\_\_\_\_

Date: \_\_\_\_\_

Signature of Person who explained this study

Date: \_\_\_\_\_

## ***Appendix E. Interview Participants' Recruitment Email***

Hi (name of potential interviewee),

My name is (insert name). I am a junior at WPI, and a member of the Worcester Red Sox IQP team. My team and I are working with the Worcester Red Sox to see how to provide the best possible user experience for the widest range of folks at the new Polar Park. We are interested in determining what kinds of services or application features might help the Park be accessible to all.

If you are interested, we would like to interview you later this week or next week via Zoom, phone or email (whatever is most convenient for you). We are available this week: (insert times and dates)). Please let us know an hour time slot that works best for you. The interview should last about 45 minutes.

Thank you for your consideration and we look forward to connecting with you!

## ***Appendix F. Survey Questions***

\*Note this is only a brief representation of the survey, the complete survey contains 81 questions. Sample questions from each category of the survey can be seen below. The complete survey can be accessed here: [http://wpi.qualtrics.com/jfe/form/SV\\_1H6Zk680oBOjnM1](http://wpi.qualtrics.com/jfe/form/SV_1H6Zk680oBOjnM1)

### **Introduction:**

Thank you for agreeing to complete this survey.

The Worcester Red Sox, a professional Minor League Baseball team, are scheduled to begin playing in Worcester in the Spring of 2021. They were recently known as the Pawtucket Red Sox until their relocation into the Canal District of Worcester. The team is a Triple-A affiliate of the Boston Red Sox and will house potential future MLB players.

We are students from Worcester Polytechnic Institute (WPI), working side-by-side with the Worcester Red Sox in order to create a mobile application for Polar Park.

By completing this voluntary survey, you are giving the team full consent to use your anonymous responses in our report.

For more information about this research or about the rights of research participants, please contact: WPI's IRB Manager (Ruth McKeogh, Tel. 508 831- 6699, Email: [irb@wpi.edu](mailto:irb@wpi.edu)) or the Human Protection Administrator (Gabriel Johnson, Tel. 508-831-4989, Email: [gjohnson@wpi.edu](mailto:gjohnson@wpi.edu)).

If you are willing to participate, please begin the survey by clicking the next button at the bottom right of this page.

### **Leisure Activities**

1. Please tell us about what you do in your free or leisure time. (Select all that apply.)

- Play Sports
- Watch Sports
- Exercise/Workout
- Attend Entertainment Events (e.g., concerts, movies, etc....)
- Shopping
- Baking/Cooking
- Arts/Crafts
- Video Gaming
- Reading
- Fishing
- Gardening
- Listening to music
- Traveling

- Volunteer work
- Going to bars
- Going out to eat
- Other (Please state in the given text box.)

2. How much time on an average do you spend doing leisure activities every week?

- 0 hrs.
- 1 hr.
- 1-2 hrs.
- 2-3 hrs.
- 3-4 hrs.
- 4-5 hrs.
- 5+ hrs.

### **Technology and Mobile Devices**

1. How do you stay in touch with information, updates, and news in general? (Select all that apply.)

- Newspaper (Paper or Online)
- Television
- Mobile Application
- Radio
- Social Media
- Other (Please state in the given text box.)

2. Do you use a smart phone?

- Yes
- No

3. Are you present on any social media platforms?

- Yes
- No

4. Do you make purchases online?

- Yes
- No

### **Polar Park**

1. Do you currently attend any of the following baseball team games? (Select all that apply.)

- Red Sox
- Paw Sox
- Worcester Bravehearts
- Other Minor League baseball teams (Please state in given text box.)
- Other teams (Please state in the given text box.)

2. How many other people attend the games with you generally?

- 0

- 1
- 2-4
- 5-10
- 10+

### **Individuals with Disabilities**

1. Do you have any long-standing illness, disability or infirmity? (Long-standing means anything that has troubled you over a period of time or that is likely to affect you over a period of time)?

- Yes
- No

2. Do you have anyone in your family who has any long-standing illness, disability or infirmity? (Long-standing means anything that has troubled you over a period of time or that is likely to affect you over a period of time)?

- Yes (Please state their age and relationship with you in the given text box.)
- No

### **Demographics**

1. How old are you?

- 18-29 years
- 30-39 years
- 40-49 years
- 50-59 years
- 60-69 years
- 70+ years
- Prefer not to answer.

2. What do you identify as?

- Male
- Female
- Other
- Prefer not to answer.

3. Please state your residential zip code.

### **Thank you**

Thank you for completing this survey. Please click on the next button at the bottom right of the screen to submit your responses.

## ***Appendix G. Graphical Report***

<https://www.dropbox.com/s/w33od74hk8az882/WOO%20Report%201.pdf?dl=0>

This link will take you to the full graphical report produced from our survey. This report was generated by Qualtrics and provides us with a visual representation of the responses from each survey question.

## Appendix H. Persona Infographics

### Jeffrey Davis - The Worcester Student



Age: 21  
Occupation: Student  
Marital Status: Single  
Location: Worcester

#### Communication Mediums

- Email
- Text messaging
- Phone calls
- Social Media

#### Bio

Jeffrey Davis is a 21 year old student from Worcester Polytechnic Institute. He enjoys going to baseball games for the social aspect as he expects to go to these events with friends among his age. He and his friends walk to the ballpark most of the time but will occasionally use Uber, Lyft, etc. Jeffrey wants to have a mobile application that will make his purchasing, navigation, and entertainment aspects easier and interesting.

#### Technological Abilities

- Tech-Savvy - Mobile applications and e-commerce/m-commerce purchases

#### Apps

- Uber
- Seatgeek
- Lyft

#### Event Frustrations

- Difficult navigation (inside and outside of the park)
- High price
- Socialization

#### Benefits/Goals

- Ticket purchase and resell ability
- Navigate ballpark easily
- Mobile ordering of food and souvenirs
- Sports betting

#### Online Shopping Frustrations

- Expensive shipping
- Delay in delivery
- Inaccurate website description
- Unclear return policies

### Joe Smith - The Head of Family



Age: 36  
Occupation: Consultant  
Marital Status: Married, 3 kids  
Location: Worcester

#### Communication Mediums

- Email
- Text messaging
- Phone calls
- Social Media

#### Bio

Joe Smith is a 36 year old family man who lives with his wife and three kids. He and his wife are hard workers because they need to provide for their family. Joe would like to see the Worcester Red Sox mobile application have a point system where the more he spends, the more rewards he gets because high prices can be difficult for him and his family. In a mobile application, he would like to have the ability to see availability for parking alongside the distance from the stadium. Last but not least, he would like a feature that would entertain his kids during the game.

#### Technological Abilities

Tech-Savvy - Mobile applications and e-commerce/m-commerce purchases.

#### Apps

- Baseball Trivia

#### Event Frustrations

- Difficult navigation (inside and outside of the park)
- Difficulty in parking
- High price
- Entertainment for children

#### Benefits/Goals

- Parking/Distance to ballpark
- Mobile ordering of food and souvenirs
- Rewards, Promotions
- Entertainment and games

#### Online Shopping Frustrations

- Expensive shipping
- Payment frauds
- Unclear return policies

## Angel Ortiz - The Die Hard Fan



Age: 58  
Occupation: Engineer  
Marital Status: Single  
Location: Pawtucket

### Communication Mediums

- Email
- Text messaging
- Phone calls

### Bio

Angel Ortiz is a 58 year old engineer who lives in Pawtucket. He is a die-hard baseball fan of the Red Sox and Paw Sox teams and never misses a game. Angel would like to see an application that has parking, ticket, and concession stands related features. He feels super frustrated to have a phone full of mobile applications with each one of them serving a different purpose.

### Technological Abilities

High - Familiarity with mobile applications and e-commerce/m-commerce purchases.

### Apps

- Worcester Red Sox Booster Club
- ParkMobile

### Event Frustrations

- Difficult navigation (inside and outside of the park)
- Difficulty in parking
- Multiple applications

### Benefits/Goals

- Navigate ballpark with ease
- Mobile ordering of food and souvenirs
- Parking spot with ticket purchase
- All in one app

### Online Shopping Frustrations

- Defective item
- Non-User friendly website
- Unclear return policies

## Alexandra White - The Single Worker



Age: 42  
Occupation: Nurse  
Marital Status: Single  
Location: Worcester

### Communication Mediums

- Email
- Text messaging
- Phone calls
- Social Media

### Bio

Alexandra White is 42 years old and is currently living and working in Worcester. She spends most of her time at work and does not have a significant other. Alexandra loves going out to events because of the socialization aspect. There's nothing better than going out to a game with her best friends and having food and beverages while enjoying something that they don't get to enjoy typically.

### Technological Abilities

- Tech-Savvy - mobile applications and e-commerce/m-commerce purchases.

### Apps

- Facebook
- Twitter
- Instagram

### Event Frustrations

- Transportation issues to reach the park
- Lack of entertainment options in park
- High price

### Benefits/Goals

- Park layout
- Bus Schedule
- Rewards, Promotions
- Mobile ordering of food and souvenirs
- Team statistics

### Online Shopping Frustrations

- Delay in delivery
- Unclear return policies
- Expensive shipping

## Patricia DeMaury - The Empty Nester



**Age:** 68  
**Occupation:** Retired  
**Marital Status:** Married, 2 kids  
**Location:** Boston

### Communication Mediums

- Email
- Phone calls

### Bio

Patricia DeMaury is a 68 year old woman who lives with her husband. After her kids left home, her husband and she found pleasure in watching the television or taking walks around the neighborhood. They occasionally find themselves taking a trip to sporting events since they grew up loving baseball. As she is growing older, she would like to have a mobile application that would offer live broadcasting of a game commentary. Additionally, an easy ticket purchase process is very important to her since technology can be difficult for her.

### Technological Abilities

Medium - Familiarity with mobile applications and e-commerce/m-commerce purchases and navigation apps.

### Apps

- Ticketmaster

### Event Frustrations

- Difficult navigation (inside and outside of the park)
- Lack of commentary
- Confusing ticket purchase process

### Benefits/Goals

- Navigate ballpark with ease
- Parking spot with ticket purchase
- A list of nearby restaurants

### Online Shopping Frustrations

- Wrong item shipped
- Payment frauds
- Item lost in transition
- Non-User friendly website

## Susan Margaret Hillard - The Physically Challenged



**Age:** 63  
**Occupation:** Retired  
**Marital Status:** Married, 3 kids  
**Location:** Pawtucket

### Communication Mediums

- Email
- Text messaging
- Phone calls

### Bio

Susan Margaret Hillard is 63 years old and is a physically disabled person. Her disability causes her to live a life that is different, and so the benefits she seeks from a stadium app are according to that of certain experiences. Susan needs a virtual map of the physical accommodations in the stadium. Furthermore, an easy to read menu on the application for concession stand items alongside delivery of those items to her seat would be very beneficial.

### Technological Abilities

Medium - Familiarity with navigation apps, mobile applications, and e-commerce/m-commerce purchases.

### Apps

- Wheel map
- Access Earth

### Event Frustrations

- Difficulty navigating to parking
- Lack of extra seating space
- Lack of service dog resting space

### Benefits/Goals

- Virtual map of stadium
- Handicap routes
- Mobile ordering of food and souvenirs
- User-friendly menu

### Online Shopping Frustrations

- Delay in delivery
- Inaccurate website description
- Non-User friendly website

## Barbara West - The Caretaker



Age: 45

Occupation: Supervisor

Marital Status: Married, 2 kids

Location: Auburn

### Communication Mediums

- Email
- Text messaging
- Phone calls

### Bio

Barbara West is 45 years old and she is Matthew West's primary care taker. Matthew is on the autism spectrum and is nonverbal. Her son really enjoys sporting events and is looking forward to attending the Worcester Red Sox games. One thing that is extremely important to her family is making sure locations are accessible for Matthew. Barbara's son struggles when walking on uneven surfaces and can not make it through the tight rows of the bleachers. She would like an option for the mobile application to purchase premium seating, with extra comfortable seats or added cushion pads, that would help keep Matthew in his seat and focused on the game.

### Technological Abilities

High - Familiarity with mobile applications and e-commerce/m-commerce purchases.

### Apps

- Auto Verbal Pro

### Event Frustrations

- Difficult navigation (inside and outside of the park)
- Loud noises
- Sun exposure
- Uneven surfaces

### Benefits/Goals

- Virtual map of stadium
- Premium seats
- Handicap routes

### Online Shopping Frustrations

- Expensive shipping
- Delay in delivery
- Inaccurate website description

# Appendix I. Benefit/Feature Infographic

 <h2>Execution of Each Persona Benefit as a Mobile Application Feature</h2> <p>Designed By: Billy Duulal, Abby O'Sullivan, and Jerry Perez</p> 	<h3>INTERACTIVE PARK MAP</h3> <p><b>BENEFITS:</b></p> <ul style="list-style-type: none"> <li>• Easy park navigation</li> <li>• Access to accommodation-friendly routes</li> <li>• Access to special areas around the park (reduced noise areas, shade areas, service pet relief areas, etc.)</li> </ul> <p><b>FEATURES:</b></p> <ul style="list-style-type: none"> <li>• Mobile interactive map with "You Are Here" feature</li> <li>• Handicap friendly routes displayed</li> <li>• Location of special areas (reduced noise areas, shade areas, service pet relief areas, etc.)</li> </ul>
<h3>TICKET PURCHASE</h3> <p><b>BENEFITS:</b></p> <ul style="list-style-type: none"> <li>• Easy and secure ticket purchase</li> <li>• Fair return policy</li> <li>• Premium seating upgrades</li> </ul> <p><b>FEATURES:</b></p> <ul style="list-style-type: none"> <li>• Mobile ticket purchase selection with seating map</li> <li>• Mobile ticket scanning</li> </ul>	<h3>ENTERTAINMENT</h3> <p><b>BENEFITS:</b></p> <ul style="list-style-type: none"> <li>• Sports gaming</li> <li>• Betting</li> <li>• Child entertainment</li> </ul> <p><b>FEATURES:</b></p> <ul style="list-style-type: none"> <li>• Woo Sox related mini-games</li> <li>• Card-collection</li> <li>• Fantasy type games</li> <li>• Betting (similar to MyBookie/DraftKings)</li> <li>• Kid friendly games (e.g. trivia, interactive scavenger hunt around park)</li> </ul>
<h3>PARKING PURCHASE</h3> <p><b>BENEFITS:</b></p> <ul style="list-style-type: none"> <li>• Easy parking</li> <li>• Secure parking reservations</li> </ul> <p><b>FEATURES:</b></p> <ul style="list-style-type: none"> <li>• Shows parking availability</li> <li>• Reserve and pre-pay for parking spot</li> <li>• Distance and route to park displayed</li> </ul>	<h3>POST GAME RESERVATIONS</h3> <p><b>BENEFITS:</b></p> <ul style="list-style-type: none"> <li>• Nearby restaurants with ratings</li> <li>• Reservation based on when the game ends to avoid timing issues</li> </ul> <p><b>FEATURES:</b></p> <ul style="list-style-type: none"> <li>• Table reservations at local restaurants</li> </ul>
<h3>MOBILE ORDERING AND DELIVERY</h3> <p><b>BENEFITS:</b></p> <ul style="list-style-type: none"> <li>• Concession stand traffic reduction</li> <li>• Avoid missing game by not waiting in lines</li> <li>• Menu availability for allergen concerns</li> <li>• Surprising friends around the park</li> </ul> <p><b>FEATURES:</b></p> <ul style="list-style-type: none"> <li>• Mobile concession ordering</li> <li>• Digital concession stand menus</li> <li>• Mobile souvenir ordering</li> <li>• Delivery of goods directly to your seat</li> <li>• Gifting items directly to friends and family throughout park</li> </ul>	<h3>APPLICATION USER PROMOTIONS</h3> <p><b>BENEFITS:</b></p> <ul style="list-style-type: none"> <li>• Affordability</li> <li>• Socialization</li> <li>• Insider exclusives</li> </ul> <p><b>FEATURES:</b></p> <ul style="list-style-type: none"> <li>• Special prices/discounts for Polar Park Application members</li> <li>• Advertisements for promotional nights</li> </ul>
<h3>LIVE GAME STATISTICS</h3> <p><b>BENEFITS:</b></p> <ul style="list-style-type: none"> <li>• Player/Team tracking</li> <li>• Fans can follow games when not at Polar Park</li> <li>• Allows the visually impaired community to enjoy the game</li> </ul> <p><b>FEATURES:</b></p> <ul style="list-style-type: none"> <li>• Mobile schedule</li> <li>• Live player statistics</li> <li>• Live broadcasting and commentary</li> </ul>	<h3>OTHER</h3> <p><b>BENEFITS:</b></p> <ul style="list-style-type: none"> <li>• Eliminate confusion of using multiple applications</li> <li>• Accommodation planning</li> <li>• Transportation planning, location, availability, and timing (bus, Uber etc.)</li> </ul> <p><b>FEATURES:</b></p> <ul style="list-style-type: none"> <li>• All features available in one application</li> <li>• List of the accommodations Polar Park offers</li> <li>• Access to different forms of transportation and where to access them in the park</li> </ul>