

# Promoting Visitation and Commerce in the Shoulder Season



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*This report represents the work of WPI undergraduate students submitted to the faculty as evidence of completion of a degree requirement. WPI routinely publishes these reports on its website without editorial or peer review. For more information about the projects program at WPI, please see <http://www.wpi.edu/academics/ugradstudies/project-learning.html>*

## Abstract

As a resort community, Nantucket experiences enormous seasonal fluctuations in population and business activity. The goal of this project was to aid the Nantucket Island Chamber of Commerce (NICC) in encouraging businesses to remain open and determine ways to increase visitation during the shoulder season. Through an iterative process with stakeholders, we developed an app and website that provides a business calendar, shows events and promotions, a business directory, and an interactive map among other features. Interviews and a survey indicated that there is strong support for such an app within the business community, but the Chamber will need to market the app effectively and encourage businesses to update their information regularly to ensure the app's success.

## Acknowledgements

Thank you to our sponsors, the Nantucket Island Chamber of Commerce, specifically David Martin and Kristie Ferrantella for their guidance. We would also like to thank Young's Bicycle Shop for providing us with bicycles during our project. We would like to thank ReMain for providing not only our group, but all the teams a great orientation to the island as well as providing everyone a generous welcome gift. We would also like to thank the Nantucket Yacht Club for providing everyone housing on island. Thank you to everyone who participated in our interviews and beta tests. A special thanks to Jason Bridges for his advice on our presentation and application designs. Finally, we want to thank our advisor Dominic Golding for his support throughout the project.

## Executive Summary

Following the demise of the whaling industry, Nantucket has refashioned itself as a premier summer resort by promoting its beaches, golf courses, historic sites, and scenery. Visitation to Nantucket is characterized by a peak season in late spring through late summer (mid-June through mid-September), two shoulder seasons (one April-June and one October-December), and an off season the rest of the year (January-March). To some extent the island has been a victim of its own success and the population typically swells from about 17,000 in February to more than 50,000 at the height of summer in July. In consort with the town and the business community, the Nantucket Island Chamber of Commerce has introduced special events like the Daffodil Festival and Christmas Stroll to encourage more economic activity in the shoulder and off seasons. These events have been very successful, but the Chamber believes much more remains to be done.

### Project Goals:

The overall goal of this project was to aid the Nantucket Island Chamber of Commerce in encouraging businesses to remain open longer and determine ways to increase visitation to Nantucket during the shoulder seasons. To achieve this goal, we:

1. Surveyed the business community to determine what factors influence businesses to open and close for the season, and what the Nantucket Island Chamber of Commerce might do to extend the shoulder season.
2. Created a website and mobile application to display business information.
3. Developed and delivered a set of training videos and materials for key constituents using the app.

### Interviews with Local Businesses:

We conducted interviews with 19 business owners to gauge the level of support for an events/calendar app and to clarify what features should be included. The consensus among interviewees was an application that could connect businesses with tourists and residents who frequent the island during the summer and who live on the island would help increase traffic to the island during the shoulder season. Features that business thought would be most useful included an integrated events calendar from the Nantucket Island Chamber of Commerce (NICC)

website, a page that shows current business promotions and a way that consumers and tourists alike can purchase products through the application.

### Survey of Local Businesses:

We received 134 completed surveys, including 87 (64.9%) from businesses that are open year-round, and 45 (33.5%) from businesses that are open seasonally. We recognize that our respondent sample may not accurately reflect the entire business community on Nantucket because we conducted this survey during the off season. Nevertheless, we were delighted that one third of our sample comprised respondents that operate seasonally. The survey revealed key points including when businesses are open and closed, what features to include, and ideas to promote the shoulder season among other insights.

### Iterative Application Design and Development Process:

To create an application that is effective for all of the involved parties, we employed an iterative design process that solicited feedback from businesses, the Chamber, and other stakeholders. We also consulted with the NICC regarding the target audiences, updating and maintenance of the applications, their preferred platforms or software, as well as the final deliverables.

Based on our initial conversations with the Chamber and our background research, we proposed two separate applications, a business-facing and tourist-facing web application which would allow businesses to enter info and tourists to view it, and a tourist-facing mobile application that would allow tourists to view the information.

Our initial conception of the mobile application included an events tab (scraped from the NICC website), a business directory with search capability for users to easily access information about the Chamber's members, a virtual map of the island with overlays for upcoming events and businesses. It also includes a promotions tab where residents can find deals on the island. Once the first iteration of our website and application were completed, we contacted business owners to participate in beta tests and made changes to the application and website based on their feedback.

## Conclusions

Conducting business interviews and beta tests as well as a survey with business owners revealed items the Nantucket Island Chamber of Commerce should focus on in the future. It is clear after interviewing business on the island that the summer months exhaust business owners' time and resources due to the large influx of people. By contrast some businesses view the shoulder season as an another opportunity to increase sales. We took both of these positions into consideration and have designed the applications to not only attract more consumers to the island for businesses that want more activity, but also added features that residents can utilize on a daily basis.

A recurring issue that our team observed throughout our project was keeping the data on the application and website current. If business hours or promotions are not up to date, it would drive away users from the applications.

When we discussed the development of a mobile application and website with business owners, almost all interviewees said that the product would have to be marketed aggressively in order to be successful. Regardless of the features of the application, the product will not simply fall into the hands of the consumers without proper marketing. Therefore, efforts must be applied towards marketing the application by the NICC and other stakeholders.

Our business interviews also highlighted that marketing should target two target audiences, businesses and consumers. Marketing efforts directed at business owners, however, will be different than the marketing efforts for consumers and tourists who use the mobile application.

Our last conclusion is that business owners may be intimidated by the maintenance they have to perform, namely updating hours, promotions, and business information. Therefore, it was clear that we had to design the application so that it is intuitive to use. The project would also benefit from the design of training videos that the NICC could use to instruct business owners on how to use the business-facing portion of the website.

## Events

Our first recommendation is that the NICC takes into consideration how many events they schedule throughout the shoulder seasons as well as the off season. They should also gauge the popularity of each event before advertising the events to the public. We also recommend that

the Chamber encourage businesses to work together and network more. We have also observed that businesses close for a variety of reasons and often without much notice.

### Keeping the Application Relevant

The Nantucket Island Chamber of Commerce should encourage businesses to update their hours months in advance on the application in order to ensure tourists can plan trips effectively. Our fear is that if a consumer or tourist opens the application on their phone to check hours for a business only to find out that the information is inaccurate then they will not use the application in the future. Therefore, it is strongly recommended that the Chamber remind businesses as much as they can to update their information regularly. They can do this with email reminders, at business after hours events, board meetings or a combination of all these.

### Marketing to Businesses

Through business interviews our team learned that the success of the mobile application and website depends largely on how it is marketed. We recommend that the NICC first market to business owners so that they can load relevant and accurate data before consumers download the application on their phones. One way that the Chamber can market to business owners is through sponsored events such as business after hours. During this event the NICC can introduce the application and website to business owners as well as show them how to load information into the applications. It is also important to consider when the website and mobile application should be released to the public. The website will be first released by the Chamber to business owners. Then, the mobile application will be released to consumers and tourists.

### Marketing to Consumers

After marketing to businesses and ensuring that sufficient current information about business hours, events, and promotions is loaded on the application the Chamber should then begin marketing to consumers. The NICC can market the application to consumers and tourists through digital advertisement on the ferries and airlines, on commercials at Dreamland movie theater, through the Chamber's website, and through advertisements in newspapers such as, *Yesterday's Island*. The Chamber should also consider marketing through the network of tourist

information centers throughout the state. Developing a rack card about the app and distributing it widely on and off the island, might be an effective option also.

### Training Materials

It is clear from beta test and interviews that business owners may be hesitant about using the applications to advertise their business on if they do not fully understand how it works. Therefore, we recommend that the Chamber inform business owners on how to navigate the website and update their business information. We opted to make training materials for the Chamber that consists of three training videos that outline specific features that businesses would have to use on the website. The topics for these videos are how to edit business details, edit promotions, and how to add business hours.

### Future Iterations of the Smartphone Application

Despite having produced a finished smartphone application and website for the Nantucket Island Chamber of Commerce there is always more that can be done to make it better. In order to improve and maintain the applications and website the Chamber should hire a design and development agency for fixing bugs, adding new features, and optimizing the app.

## Authorship

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2.0	GR	JG
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2.3	GR	JG, NK
2.4	JG	GR, NK
2.5	SG	All
2.5.1	SG	All
2.5.2	SG	All
2.5.3	SG	All
2.5.4	SG	All
2.6	NK, GR	JG
3.0	JG	GR
3.1	NK	GR
3.1.1	NK	GR
3.1.2	NK	GR
3.1.3	NK	GR
3.2	NK	GR
3.3	SG	JG
3.3.1	SG	JG
3.3.2	JG	GR

3.4	GR	NK, JG
4.0	GR	NK
4.1	GR	JG
4.1.1	GR, JG	NK
4.1.2	JG	NK
4.1.3	GR, JG	NK
4.1.4	GR, JG	NK
4.1.5	JG	NK
4.1.6	JG	NK
4.1.7	JG	NK
4.1.8	JG	NK
4.2	GR	JG, NK
4.3	SG	All
4.3.1	SG	All
4.3.2	SG	All
4.3.3	SG	All
4.3.4	SG	All
4.3.5	GR	JG, NK
5.0	NK	All
6.0	NK	All
6.1	NK	GR
6.2	NK	All
6.3	NK	All
6.4	NK	GR
6.5	NK	All
6.6	NK	All

6.7	NK	All
Appendix A	JG, GR, NK	N/A
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Appendix C	JG	N/A
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## 1.0 Introduction

For many communities in the United States, tourism is a mainstay of the local economy. In 2017, tourism supported approximately 7.8 million jobs, and contributed \$1.62 billion to the United States economy (Travel Trade, 2017). Unfortunately, the tourism industry is notoriously seasonal. People flock to beach resorts in the summer and ski resorts in the winter. This seasonal flux creates myriad problems for resort communities. Resort communities struggle to build and maintain the infrastructure (parking, policing, and sanitation), and services (accommodations, retail outlets, and restaurants), to support the influx of visitors during the peak season. In the off-season, businesses may close, infrastructure is underutilized, and both the public and private sectors may be forced to lay off workers. Given these problems, many communities in the United States are exploring ways to extend and promote tourism in the shoulder season.

Following the demise of the whaling industry, Nantucket has refashioned itself as a premier summer resort by promoting its beaches, golf courses, historic sites, and scenery. Visitation to Nantucket is characterized by a peak season in late spring through late summer (mid-June through mid-September), two shoulder seasons (one April-June and one October-December), and an off season the rest of the year (January-March). To some extent the island has been a victim of its own success and the population typically swells from about 17,000 in February to more than 50,000 at the height of summer in July. In consort with the town and the business community, the Nantucket Island Chamber of Commerce has introduced special events like the Daffodil Festival and Christmas Stroll to encourage more economic activity in the shoulder and off seasons. These events have been very successful, but the Chamber believes much more remains to be done.

Accordingly, the overall goal of this project was to aid the Nantucket Island Chamber of Commerce in encouraging businesses to remain open longer and determine ways to increase visitation to Nantucket during the shoulder seasons. To achieve this goal, we:

1. Surveyed the business community to determine what factors influence businesses to open and close for the season, and what the Nantucket Island Chamber of Commerce might do to extend the shoulder season.
2. Created a website and mobile application to display business information.

3. Developed and delivered a set of training videos and materials for key constituents using the app.

We found the business community largely supported more marketing efforts, whether that be better marketing of existing events, businesses posting promotions and advertisements to social media, or increasing the marketing of the island as a whole. Many businesses were in favor of new events, such as oyster festivals, music festivals, and more conferences. Most of the businesses we encountered were in favor of the application we developed, as it would help connect tourists, residents, and businesses together. The major features of the application showcased business' opening and closing hours, promotions, and events.

## 2.0 Background

In this section, we review the development of Nantucket as a resort economy, the problems associated with seasonal tourism, and approaches implemented in Nantucket and elsewhere in the world to try to address these problems.

### 2.1 Tourism as an Industry

Tourism is a major contributor to the United States and Massachusetts economies. The US tourist sector generated \$1.6 trillion (2.8% GDP) in 2017 and supported 7.8 million jobs (Travel Trade, 2017). In Massachusetts the tourist sector generated, “\$22.9 billion in direct spending, and supported 149,400 jobs in 2017 and \$5.4 billion in wages and salaries.” (“2018 Annual Report”, 2019). As elsewhere, tourism in Massachusetts is seasonal in nature. For example, of the 24.2 million visitors in 2017, “16% of domestic visitors came in Q1, 26% during Q2, 35% during Q3 and 23% during Q4.” (“2018 Annual Report”, 2019). While there are no official statistics for Nantucket, tourism is a major contributor to the economy, but visitation varies greatly by season.

### 2.2 The Origins of Tourism in Nantucket

Starting from humble beginnings as a farming and later a whaling community, Nantucket has grown into an extremely popular tourist destination. Following the collapse of the whaling industry in the 19th century, the population of Nantucket had declined from around 10,000 to a low of 3,000 (Seegers and Giordano, 2015). Early in the 20<sup>th</sup> century a small number of artists and summer visitors ‘discovered’ the island, attracted by the historic buildings and natural resources. The number of visitors began to grow through the 1950s when a developer, Walter Beinecke, realized the tremendous potential of the island as a high-end resort destination. Beinecke began to acquire properties around the harbor and developed long-term plans to redevelop the waterfront. In 1961, Beinecke founded the Nantucket Historic Trust as a vehicle to purchase, restore, and protect the many historic buildings in the downtown area. At the same time, island residents feared that development might destroy the historic charm of Nantucket and in 1955 designated downtown as a historic district, the first such designation in the US. The historic district was extended to incorporate the entire island in 1966 (Seegers and Giordano, 2015). Subsequently, the Nantucket Conservation Foundation was formed in 1965 and the

Nantucket Land Bank in 1984 (Seegers and Giordano, 2015). As a result of these actions, more than 50% of the island is now protected as conservation lands that are accessible to the public, and the architectural history and aesthetics are preserved for future generations. These unique island resources are the major reasons so many people are attracted to Nantucket.

### 2.3 Seasonal Population and Businesses of Nantucket

Keeping track of Nantucket’s population during the summer is a difficult task. Airline companies know how many people board their planes each day and ferries companies similarly know how many people board their boats. The challenge is determining who decides to stay for the day and who decides to stay for the week. The fluctuation of this data can be easily seen in Figure 1. The radial graph shows that there are approximately 17,000 people on the island in February, these being nearly all year-round residents of the island. The population then rises substantially during the summer season (June to September), with spikes on some occasions during July and August of about 50,000 people. Figure 1 illustrates not only the weekly rise and fall in population throughout the year, but also especially the dramatic impact of ‘hallmark events’, such as Stroll weekend, Figawi, and the 4th of July (“Effective Population”, 2017).

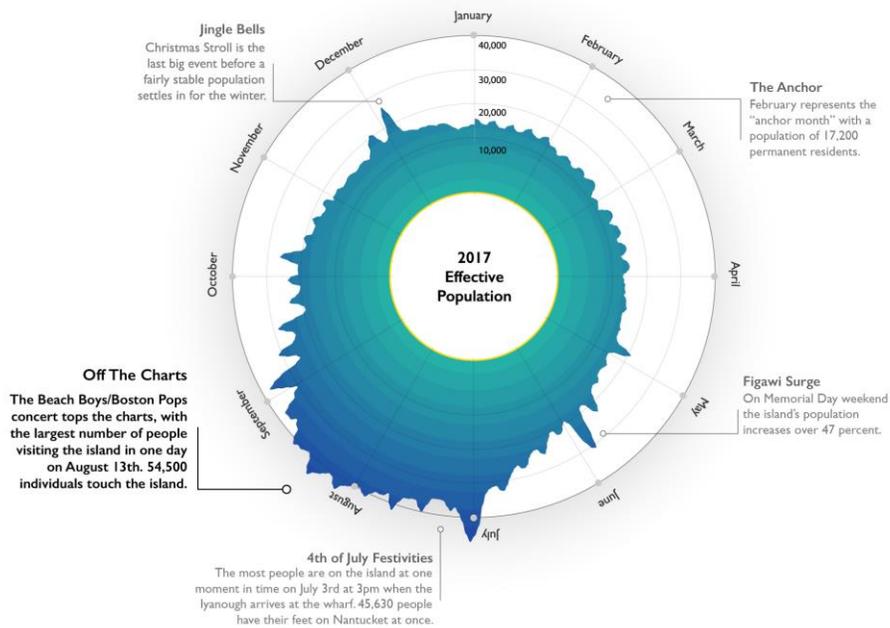


Figure 1. Effective population in Nantucket (“Effective Population”, n.d.).

While the extreme seasonality of visitation presents enormous problems for businesses and local governments, tourism remains a mainstay of the economy. For example, in 2012, (the most recent data available), Nantucket generated \$120 million from just food and accommodations, and more than \$300 million in retail sales (“Nantucket County Massachusetts”, 2012). To accommodate the surge in population and economic activities in the summer, businesses and town government hire large numbers of seasonal or temporary workers. For example, Figure 2 shows that the number of people employed doubled from 5,000 in the off-season to 10,000 in the summer in 2018. It is quite likely that this data underestimates the true size of the workforce in the summer, since many are casual laborers (short term temporary workers). In 2017, out of the roughly 4,479 people employed on the island, 15.7% work in the retail business (the largest industry on Nantucket according to the article), and roughly 6.25% work in the restaurant industry (“Nantucket, MA”, 2017). Figure 3 shows that roughly half of the business on island close during the off-season. Unfortunately, the closing of some businesses may exacerbate the propensity of others to close: visitors are less likely to come to Nantucket when fewer businesses are open, and the reduced visitor traffic forces other businesses to close also.

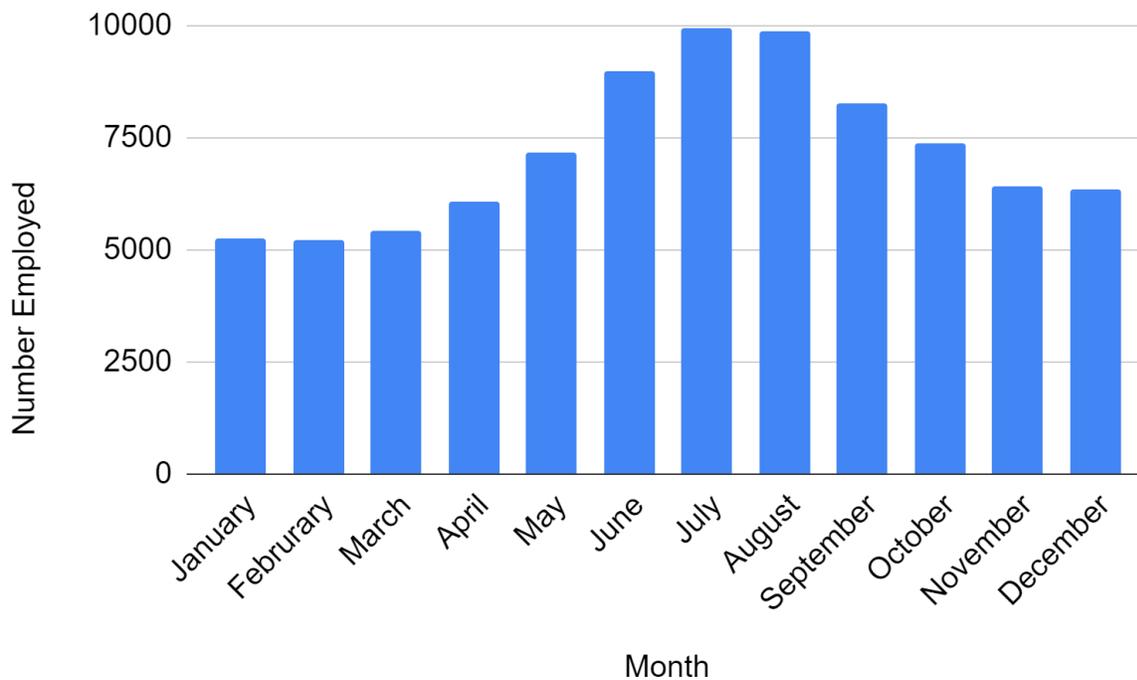


Figure 2. Employment Data about Nantucket in 2018 (“Labor Force and Unemployment Data: Nantucket”, n.d.).

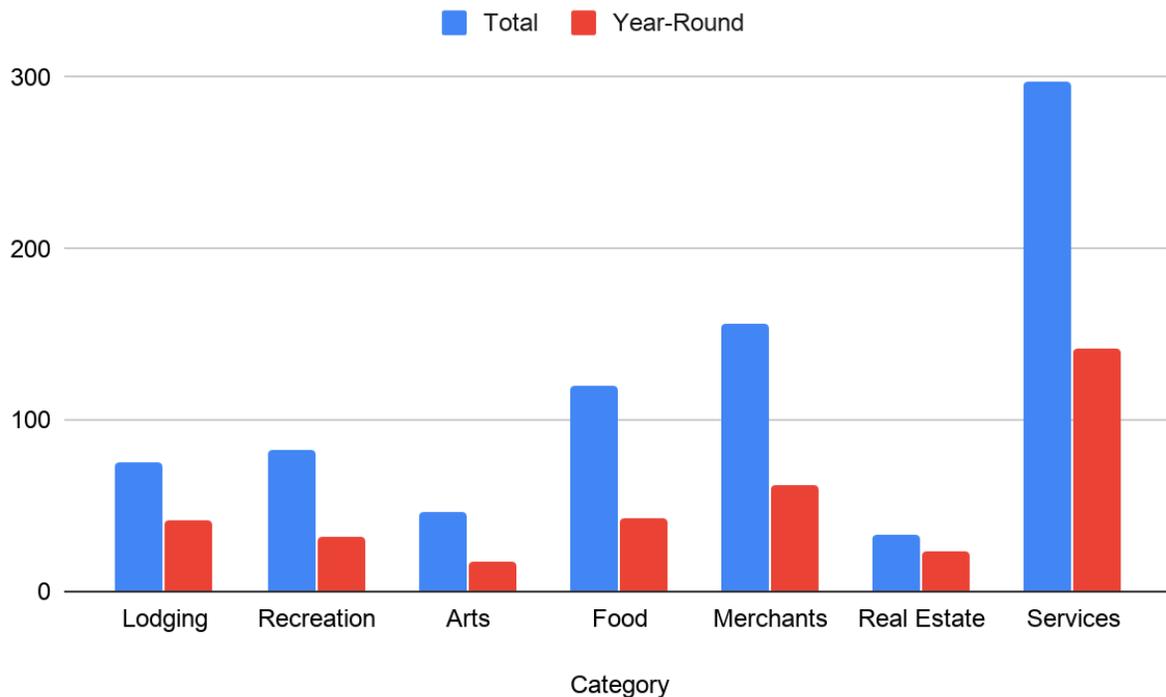


Figure 3. Businesses that are open year-round versus the total number of businesses (“Nantucket 2019-20 Official Guide”, 2019).

This wave of traffic in the summer months and lack of business in the shoulder season and off-season causes strain on businesses and local government agencies that are problems suffered by all seasonal communities.

## 2.4 Seasonality in Tourism

Nantucket is not alone in experiencing wide seasonal fluctuation in visitation and economic activity. Other communities such as, ski and beach resorts, experience the same wide swings in population. Butler (2001, p.5) defines seasonality as “a temporal imbalance in the phenomenon of tourism, which may be expressed in terms of dimensions of such elements as numbers of visitors, expenditure of visitors, traffic on highways, and other forms of transportation, employment and admissions to attractions.” The two main causes of seasonal tourism are climatic seasons and the school and holiday calendar (Koenig and Lewis, 2005). Seasonal changes in the weather affect ski and coastal resorts in particular (Koenig and Lewis,

2005). Other tourist destinations may be affected more by certain holidays or events such as spring break or Halloween. Some may be affected by a combination of both, such as school holidays and holiday weekends that occur during the peak season (Butler, 2001, p5-7). In seasonal tourist communities, the year tends to be split into four different periods: the high season, the off-season, and two shoulder seasons (typically spring and fall). The ebb and flow of tourists creates different kinds of problems at different times of the year that seasonal communities must address.

Seasonal tourist communities face a host of problems related to employment, provision of infrastructure, and the environment (Chung, 2009). Hotels, restaurants, retailers, and other businesses that cater to tourists, must hire additional staff during peak season and lay them off during the off-season. Similarly, state and local government must hire additional staff, such as police cadets, lifeguards, and sanitation workers to handle the demands of tourism. This fluctuation in employment is an enormous burden for both public and private employers and a tremendous strain on temporary employees especially. The seasonal fluctuation in population also places an inordinate strain on community infrastructure. Cities and towns must build and maintain infrastructure, such as roads, parking, sewers, and water supplies, sufficient to manage peak demands, while for much of the rest of the year, the infrastructure is under used. The off-season may, however, offer some respite to local residents, since traffic congestion, noise, pollution, and crime may decline. The off-season may also allow parks and conservation areas to recover following overuse during peak periods (Chung, 2009).

## 2.5 Potential Solutions to the Problems of Seasonal Tourism

There are different opinions about potential solutions to the problems of seasonal tourism. Indeed, some business owners may not even see seasonality as a problem in need of solutions (Koenig-Lewis and Bischoff, 2010, p. 396-397). “Although seasonality is perceived as a salient issue for the sector itself, it is not universally perceived to be inherently problematic from the perspective of the individual business operator” (Duval, 2005, p. 325). Duval finds that while some businesses want to increase their off-season visitation, others see it as a break from the busier seasons (Duval, 2004). According to Weaver and Oppermann, relevant strategies

include increasing demand in the off-seasons, redistributing demand from the peak season to the off-seasons, and increasing supply in the peak season (Weaver and Oppermann, 2000, p. 210-211). Like Weaver and Oppermann, Getz and Nilsson (2004) distinguish among three strategies that they call *coping* (i.e., increasing demand in the peak season), *combating* (i.e., redistributing demand from peak seasons to off-seasons) and *capitulating* (i.e. closing the business temporarily or permanently) (Getz and Nilsson, 2004). Both strategies allow analysts to determine what businesses have adapted to be performant in off-seasons and which struggle (Koenig-Lewis and Bischoff, 2010, p. 396-397). For those that choose to “combat” the adverse effects of seasonality, many have implemented several strategies to promote more economic activity in the shoulder seasons. Communities and businesses have explored a variety of approaches to promote activity in the shoulder and off-seasons, with so-called ‘hallmark events’ being the most popular solution (Koenig-Lewis and Bischoff, 2005, p. 201, 204, 211, 213-214).

### 2.5.1 Hallmark Events

One of the solutions that seasonal resorts and communities explore is creating ‘hallmark events,’ which are defined as “major one-time or recurring events of limited duration, developed primarily to enhance the awareness, appeal, and profitability of a tourism destination in the short and/or long term” (Hall, 1989, p. 265). Examples of hallmark events include internationally recognized events like the Olympics, national events such as the Monaco Grand Prix, regional events similar to the Festival of Perth, and local events like the Wellesley Apple and Butter Festival (Hall, 1989, p. 266). These events are designed to boost activities and revenues, especially in the shoulder or off-seasons in seasonal tourist communities (Hall, 1989, p. 263). The impact of these events on the tourist economy depends on a number of factors such as, the size of the event and the level of financial support from the community (Hall, 1989, p. 265). Ritchie (2010) examined the economic impacts of the Quebec Winter Carnival, an event that began in 1894 (“Carnival De Quebec”, n.d). His two primary conclusions were that: “Such events can contribute significantly to the offsetting cyclical lack of demand in the travel market” and “The long run or secondary impact of hallmark events on tourism is real but difficult to measure.” (Ritchie, 2010, p18).

## 2.5.2 Marketing

Many parties engage in efforts to promote tourism through a variety of marketing strategies. These include the businesses themselves aiming to stay open longer and make more profits, Chambers of commerce, rotary clubs, cultural councils, and other tourism-oriented public-sector offices. The goal of these entities is to draw tourists to their respective resort communities and to generate more business activity and revenue. A few marketing strategies that these destinations employ are pricing changes (Chung, p. 89) and online communication (Allesandro, p. 565). The latter, and its subsection, e-marketing and e-tourism, are growing solutions as well (Buhalis, 2008, p. 609). In addition, Baum (1999) explores examples of entities adding value to their destinations, varying their offerings, and pricing incentives. Florida, the Caribbean islands, and Hawaii have all had success using these approaches to attract Europeans and developing year-round attractions (Baum, 1989, p. 7). Northern destinations like Prince Edward Island have marketed culture and sport-based offerings in order to extend their shoulder season, as well as utilizing the aforementioned hallmark events (Baum, 1989, p. 7).

## 2.5.3 Sales and Pricing Changes

Promotions are a standard practice for driving traffic to a business. In the case of seasonal tourism, this may manifest as a way to drive additional traffic during the off-seasons (Chung, p. 89). Butler (2001) found that price reductions, discounts for repeat visits, and package deals were the most effective incentives offered by hotels (Butler, 2001, p. 137). These package deals can include free stays, other assorted gifts, and combination deals with other businesses (Butler, 2001, p. 138).

## 2.5.4 E-Tourism

A modern marketing solution being used by businesses and communities is e-tourism. This term, also known as e-travel, is the connection of businesses and the tourists they serve through the internet as a way to innovate in the tourism industry (Pan, 2015, p. 2). Pan elaborates on different kinds of e-tourist technologies, such as online restaurant bookings and hotel reservations, commerce tools for online shopping, and consumer platforms for information and planning trips (Pan, 2015, p. 3). Four billion people are connected to the internet and almost four billion people have smartphones (“Mobile Internet Usage Worldwide”, n.d.), and this number is

rising. By combining promotions and hallmark events with the concept of e-tourism, including functionality like calendars, trip planners, online bookings and reservations, devices become a powerful channel for advertising and attracting consumers, extending the shoulder seasons.

## 2.6 Efforts to Promote the Shoulder Season on Nantucket

The business community, Nantucket Island Chamber of Commerce, Department of Culture and Tourism, Massachusetts Office of Travel and Tourism, ReMain Nantucket, and others are all working together to determine how Nantucket can best deal with the problems posed by seasonal variations in population. In particular they have collaborated in various ways to encourage greater commerce in the shoulder and off-seasons. These efforts include marketing on and off island, the designation of the Cultural District, and the creation of a variety of ‘hallmark’ events, such as Figawi, the Fourth of July fireworks, and the Nantucket Film Festival. The NICC has been instrumental in all these efforts, but in particular it has taken lead responsibility in creating and implementing the Daffodil Festival and the Nantucket Noel, colloquially known as Christmas Stroll.



Figure 4. Christmas Caroling during Christmas Stroll (Duncan, 2017).



Figure 5. Crowds in Nantucket during Christmas Stroll (Nantucket Island Chamber of Commerce, 2017).

For the entirety of the month of December, the Nantucket Chamber of Commerce puts on the Nantucket Noel. There are multiple events within this month-long event including Stroll Weekend, Red Ticket Drawing, and the Nantucket New Year's ("Nantucket Island Chamber of Commerce", 2019). During this NICC sponsored event, the population on the island spikes to around 25,000 people ("Nantucket Island Chamber of Commerce", 2019). For the past 45 years, the NICC has also promoted the annual Daffodil Festival, which occurs on the last weekend in April. The festival includes art shows, parades, and of course daffodils. During this event, the population on the island jumps up to roughly 20,000 people ("Nantucket Island Chamber of Commerce", 2019). These events during the shoulder season help the island of Nantucket prosper in many ways, as restaurants reopen for these events, hotels and inns are needed to house the spikes in tourism, and the island gets more exposure during months it normally would not. Marketing becomes a key to making people aware of these off-season events. The NICC primarily advertises these events through print media, online advertising, rack cards, and a calendar online ("Nantucket Island Chamber of Commerce", 2019).



Figure 6. Storefront decorated for Daffodil Festival (Nantucket Island Chamber of Commerce, 2019)



Figure 7. Visitors in Nantucket during Daffodil Festival (Nantucket Island Chamber of Commerce, 2019).

The Department of Culture and Tourism's main objective is to stimulate the economy of Nantucket by offering visitor services in the hopes that this will create a more vibrant downtown. They serve tourists by advertising events on island, opening and closing hours of businesses and much more for visitors on their website ("About Us: Town of Nantucket Culture & Tourism", 2018). This website serves as a central hub for visitors of the island. For example, their website shows hotel availability on the island for the current day. This would be useful knowledge to someone who wanted to plan a trip to Nantucket. The website also advertises various ways of getting around the island. This includes everything from public transportation to popular bike paths to explore. The Department of Culture and Tourism wants to aid in visitation to the island, but in a way that also preserves the unique culture that has developed in Nantucket.

Similarly, the Nantucket Cultural District promotes the livelihood of arts and culture to visitors of the island and emphasizes the role of Nantucket's culture in the success of businesses. Their mission is to promote the role that art and culture play in making the community of Nantucket enjoyable. Their goals are to increase visitor interest in activities involving the culture of Nantucket, to increase partnership between businesses and culture centered organizations, to increase economic success of businesses and cultural organizations and to bolster learning experience of the history of Nantucket (Nantucket Cultural District, 2018). One example of this is the Nantucket Arts Festival that the cultural district organizes every year with the Nantucket Arts Council. This event is intended to promote local art and culture, the Nantucket Cultural District's main mission.

Despite all the efforts of the Chamber, local government, businesses, and other organizations to promote year-round activity on Nantucket, much remains to be done to promote business activity and visitation in the shoulder and off-seasons. In this project, we conducted a survey of business owners to understand how they decide whether to remain open in the shoulder-season. We also developed an app that allows businesses, residents, and visitors to see more easily what business are open when, what specials are offered, and what activities and events are upcoming. In the next section we describe how we developed the survey and app.

### 3.0 Methodology

The purpose of this project is to aid the Nantucket Island Chamber of Commerce in encouraging businesses to remain open longer and determine ways to increase traffic to Nantucket during the shoulder season. To accomplish our purpose, we identified three major objectives.

1. Determine what factors influence when businesses open and close for the season and what the Chamber might do to extend the shoulder season.
2. Create a web and mobile app to monitor and display business openings and activities on Nantucket.
3. Develop and deliver a set of training videos for key constituents.

Figure 8 shows the major tasks associated with each objective that we discuss in more detail below.

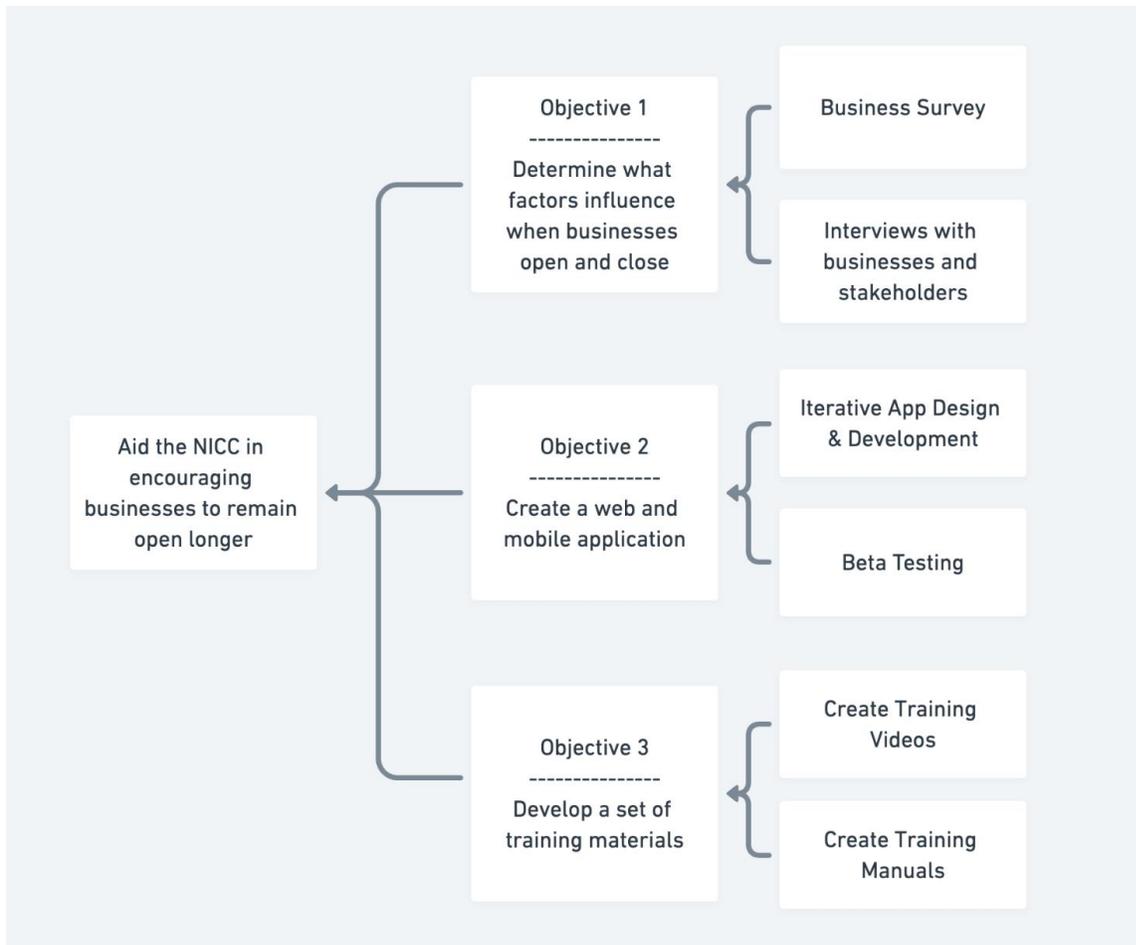


Figure 8. Flowchart Representation of Objectives and Tasks

### 3.1 Determine Factors That Influence Business

To determine what factors affect the operating hours of businesses during the shoulder season, we have conducted a survey of business owners on Nantucket, supplemented by in depth interviews with business community stakeholders.

#### 3.1.1 Business Survey

We developed and refined a survey that went through multiple iterations with constant feedback given to us by the president and vice president of the Nantucket Island Chamber of Commerce. Once the final iteration of the survey was developed, it was sent out to the business community of Nantucket. The business survey was designed to reveal the reasons why businesses on Nantucket decide to stay open or closed during the shoulder season. We also used the survey to identify business owners who were willing to participate in follow up, in-depth, face-to-face interviews. A copy of the final version of the survey is presented in Appendix A.

#### 3.1.2 Survey Delivery Mechanism

The business survey was distributed to NICC members through an email sent by the Nantucket Island Chamber of Commerce. The initial email for the link to our survey was sent out by the vice president of the NICC on October 31st, 2019. A follow up email was sent out as a reminder to fill the business survey out on November 7th, 2019. The reminder email was sent out as an attachment to the NICC's weekly newsletter. The email included a brief description of our project goal as well as the survey itself. Sending the survey through the NICC ensured that it was anonymous and confidential, as the NICC held a raffle on our behalf as a thank you for completing our survey. We anticipated that there will be a small number of responses from business owners, therefore the decision to provide an incentive to recipients of the survey increased the response rate.

#### 3.1.3 Analytics

Once we received feedback from the business survey, we analyzed what we thought each piece of information meant. This was a much longer process because each of the free response answers were open for interpretation. To make things easier on ourselves, we decided to code

each free response with a numbering system. For example, for one of the free response questions, we had four different response codes; other, nothing, marketing, or new events. Each response fell into one of these categories, and graphs were acquired as a result of this data. For the non-free response questions, graphs were immediately developed to illustrate trends in our business survey data.

### 3.2 Business Interviews

We conducted 19 interviews with local businesses on the island to gain their perspectives on the shoulder season. The advantages of having meetings with business owners is so one can have a better understanding of what the business owner is trying to convey through more in-depth explanations and body language. These businesses were identified by walking around Town, referrals by the NICC, and positive responses to the business survey. Before the interviews began we provided the business owner with a preamble that outlined how long the interview would take (15 minutes or so), how the information was recorded, where it was used, and whether we had permission to use their responses outside of the interview. The questions on our interview script were not discussed with the participant before the interview so that we received the most unbiased answer. Questions asked during the interview were pertaining to the project goal and drew usable information for a solution (Palmquist, 2018). Reflecting questions from the business survey, interviews conducted before the survey was sent out were more focused on determining when businesses open and close, what does the business and the NICC do that extends the shoulder season, and if they could think of any potential solutions to get more visitor traffic on the island. Interviews that were conducted after the business survey was sent were more geared towards what features would be advantageous in our application, and what strategies for marketing have you employed for your business. In addition, we had the application downloaded to our phones so the business owners we interviewed could use the application and say what they liked and disliked. A copy of the interview script can be seen in Appendix B.

### 3.3 Create a Web and Mobile App to Monitor and Display Business Openings and Activities on Nantucket

The Nantucket Island Chamber of Commerce wants a web-based and mobile application that allows for businesses to collaborate with each other regarding their dates of operation, as

well as inform tourists when businesses are open and if any businesses are running any promotions at the time. The Chamber thinks that providing tourists and businesses with these tools will both aid businesses in making the decision to stay open longer and extend the shoulder season by bringing more tourists to the island during these non-peak times.

### 3.3.1 Research and the Iterative Process

To create an application that is effective for all the involved parties, we employed an iterative design process that solicited feedback from businesses, the Chamber, and other stakeholders. We also consulted with the NICC regarding the target audiences, updating and maintenance of the applications, their preferred platforms or software, as well as the final deliverables. We believed we would have the time and ability to deliver a fully working app. In the event that we could not deliver a working app, the Chamber would have to consult with a third-party development firm to complete the development process.

We also evaluated what types of applications exist and what features they offered. Based on our initial conversations with the Chamber and our background research, we proposed two separate applications, a business-facing and tourist-facing web application which would allow businesses to enter info and tourists to view it, and a tourist-facing mobile application that would allow tourists to view the information.

Our initial conception of the mobile application included an events tab (scraped from the NICC website), a business directory with search capability for users to easily access information about the Chamber's members, a virtual map of the island with overlays for upcoming events and businesses. It also includes a promotions tab where residents can find deals on the island. Once the first iteration of our website and application were completed, we contacted business owners to participate in beta tests and made changes to the application and website based on their feedback.

### 3.3.2 Beta Testing

Incorporating feedback from the business survey, interviews, and feedback from our sponsor throughout the application design process was essential in ensuring our final application was usable, intuitive, and addresses the concerns of its users. Beta testing was used to target the primary users of the application, those being business owners and other stakeholders, and

consisted of a few participants per test, since smaller groups will be more manageable, especially for this kind of design feedback (Krueger & Casey, 2014). Our group recruited participants through the business survey and through interviews. For the beta tests we developed a script with a set of instructions and questions for the participants. These questions and instructions were made so we could gauge the participants on certain consistent metrics such as how long it took them to do certain tasks and how easy they thought it was. Once the instructions were read out to the participants, they were given the application and website to use. First, they were asked to find the business hours of the Chamber of Commerce and then to enter their business data into the website, during both tasks the amount of time it took and if they had to ask for any guidance was recorded. Afterwards they had time to experiment with the application and were asked some questions about their thoughts on it. Appendix C includes a script of questions and tasks that were asked to participants. After each beta test, we debriefed with our group to identify ways to improve the application.

### 3.4 Develop a Set of Training Materials for Key Constituents

Once the final iteration of our application was completed, we developed training materials, which included step-by-step instructions for businesses to enter in information, and a video tutorial illustrating key parts of the website and application for the NICC staff and members of the business community. For members of the NICC, we also explained how to maintain the application, how to potentially link it to their already existing website, and what possible errors may occur. These training materials also garnered the opportunity for business owners to get answers to questions they may have had while first using our website and application.

## 4.0 Findings

In this section, we first discuss the results and findings from the business survey and the business interviews that were conducted and explain in detail how they influenced group decisions about the design of the app. Second, we explain how data from each graph influenced our decisions to add specific features to the smartphone application and website. Finally, we explain how the website and mobile application evolved over the course of multiple iterations with beta test feedback. The instructions for the maintenance of the website and mobile application as well as associated costs can be found in Appendix D.

### 4.1 Business Survey Results

Through the business survey, we were able to develop a better understanding of why businesses open and close with the seasons, and solicit business owners' opinions about the value and features of the proposed app. As noted previously, we received 134 completed surveys, including 87 (64.9%) from businesses that are open year-round, and 45 (33.5%) from businesses that are open seasonally. Two respondents did not indicate in which seasons they operate. We recognize that our respondent sample may not accurately reflect the entire business community on Nantucket because we conducted this survey during the off season. Nevertheless, we were delighted that one third of our sample comprised respondents that operate seasonally. Some respondents skipped some questions, so the number of respondents on particular questions discussed below do not always add up to 134. Our major takeaways from this survey are as follows:

#### 4.1.1 Variation of Staff Size with Season

Figure 9 shows that the majority of respondents are small businesses that employ 1-3 staff members in the peak and shoulder seasons. This figure also shows that the number of businesses with 25 or more staff declines from 21 in the peak season to 10 in the shoulder season. Curiously, the figure indicates that the number of businesses with 1-3 staff members increases in the shoulder season, which seems counter-intuitive. We infer that businesses with large numbers of staff during the peak season, reduce staff in the shoulder season, which accounts for this apparent increase in businesses with smaller staffs during the shoulder season.

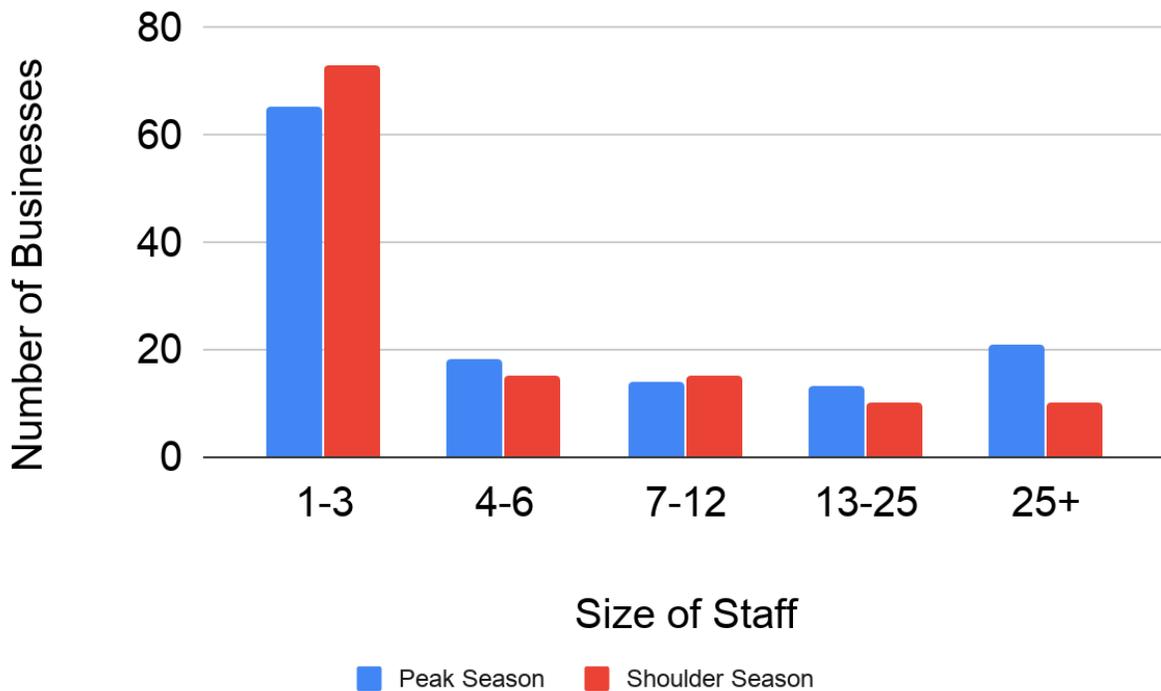


Figure 9. Variations of Staff Size with Season (n = 131).

#### 4.1.2 Importance of Marketing, Online Retail, and Specials and Deals in regard the Shoulder Season.

The challenges presented by the shoulder season requires businesses to do more to get customers in the door. Figure 10 shows that 77% of businesses thought marketing was an important or very important factor in increasing business. Online retail was considered important or very important by only 30% of businesses, but this may be explained by the type of businesses. For example, it is difficult for some types of businesses, such as accommodations and services, to offer products online. Not surprisingly, a lot of the respondents indicating online retail as important or very important were retail shops.

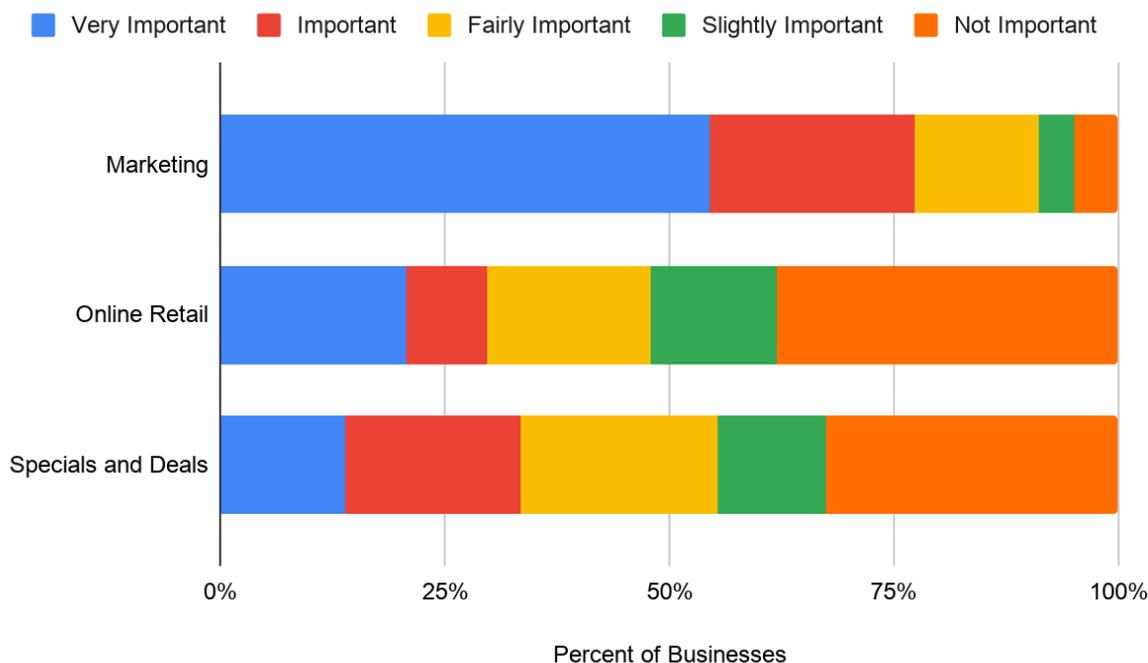


Figure 10. Importance of marketing, online retail, and specials and deals during the shoulder season (n = 123).

### 4.1.3 Businesses Openings by Month During the Year

Figure 11 shows that 87 of the responding businesses are open year-round and 45 were open seasonally. While this sample may not represent the entire business community on the island due to sampling bias at the time the survey was conducted, the graph clearly illustrates that seasonal businesses start to open again around March and April and begin closing in October. Clearly, more seasonal businesses remain open in November and December than in the winter and this may reflect the impact of Thanksgiving and Christmas Stroll.

Figure 12 displays what months businesses are open by business type. Retail businesses are affected very strongly by seasonality as shown by the major spike in the number of businesses open from March to April. Most other business types are affected less strongly by seasonality with there being a slight upward curve but not a major spike. The other types of businesses have an inverse trend with more closing down during the peak season because certain types of businesses such as construction companies do not operate as much during the peak season. There is probably an under representation of seasonal businesses in our results as many seasonal businesses that are fully closed are not checking their emails, therefore, the curve is less distinct than it may be.

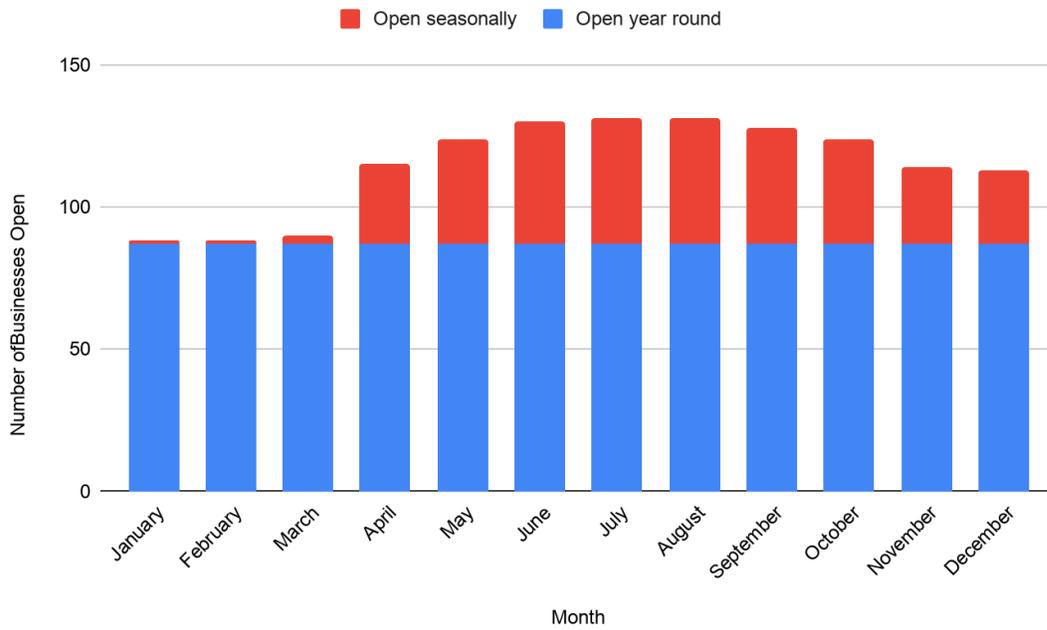


Figure 11. Businesses open by month (n = 131).

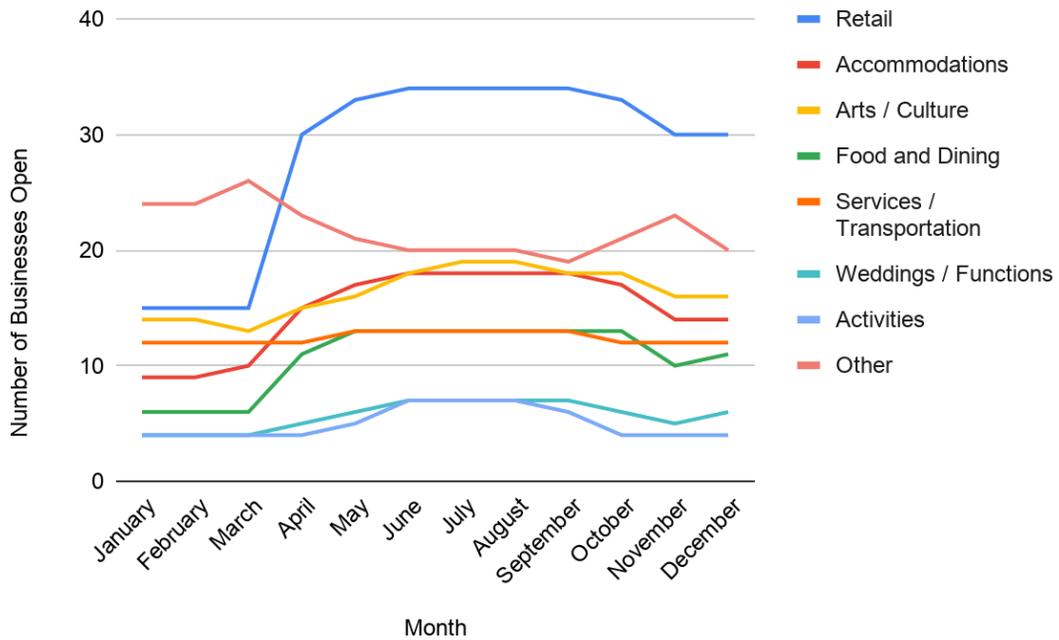


Figure 12. Number of businesses open by month and type (n = 131).

### 4.1.4 Application Usage

In advance of the project, we were not sure how many people might use the website and app we developed, so we asked business owners to estimate what proportion of their customers might be likely to use such an app. Figure 13 indicates a substantial number of business owners (30%) think 50-75% of their customers would use the app. Furthermore, approximately 26% of respondents to this question believe 25-50% would use our application. One caveat is that the data presented in this graph is based on owners and managers opinions about their likely customer usage. Actual uptake and usage may be substantially different. The actual usage of the application will depend strongly on marketing and the ability of the app to meet customer needs.

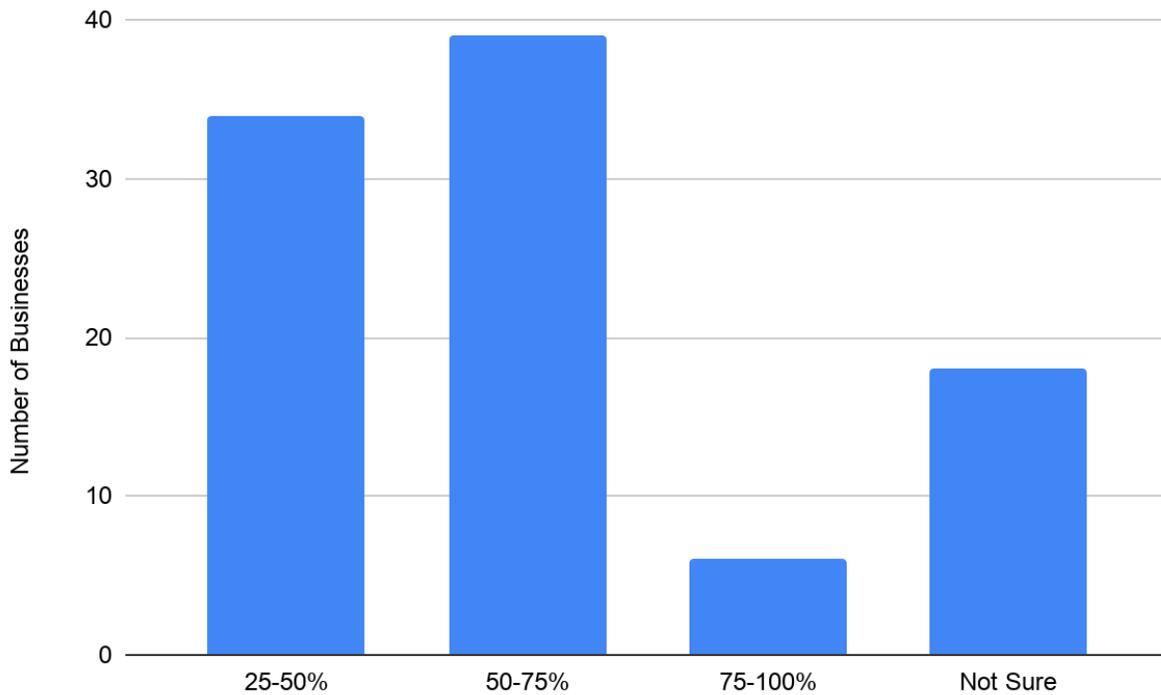


Figure 13. Percentage of customers that businesses think would use the application (n = 130).

### 4.1.5 Application Features

Figure 14 shows that all the features we built into the app were considered important or very important by more than 69% of all respondents, from this we can assume that we selected the most desirable features for the application. The calendar of events and detailed up-to-date business hours were ranked some of the most important features for businesses, so we tried to improve those features the most. Information on promotions, a searchable map, and searchable

directory were all also important to businesses, so we tried to polish these features up as well. We did not ask directly what other features might be desirable, so it is possible that other features should be added to the app in the future.

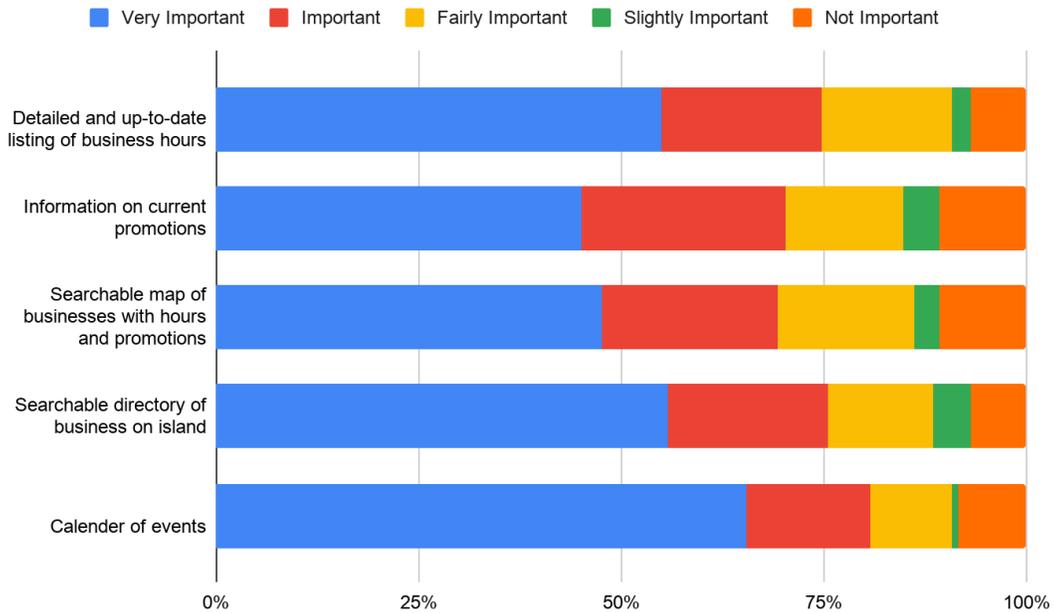


Figure 14. Importance of different features in the application (n = 131).

#### 4.1.6 Ideas to Promote the Shoulder Season

We asked respondents what new events or promotions would increase business in general during the shoulder season. Figure 15 indicates that a majority (52%) of businesses want new events or more events to promote business in the shoulder season. Several (14.5%) emphasized the need for more promotions and 7% emphasized more marketing for current events. A sizeable proportion (19%) stressed no additional effort was required. Several (17%) of respondents suggested the same new events such as scallop-fest/oyster-fest or a music festival. Please note that this graph was based from an open response question with only 69 respondents. The question might have been a bit suggestive leading people to answer new events more frequently.



Figure 15. Business ideas of new events to promote the shoulder season (n = 69).

#### 4.1.7 Business in the Shoulder Season

We asked respondents what other things their businesses do in the shoulder season to increase business, separate from the previous question about new events in general. Figure 16 shows that most businesses focused on promotion or marketing to help in the shoulder season. A substantial number of respondents thought things such as social media marketing, lower prices for products, consistent hours, promotions on products, and combo packages were all important tools for businesses to use. Our application will be able to help with some of these efforts by providing another avenue to market events and promotions, increase awareness about businesses still open during the shoulder season and providing up to date business hours. Please note that this graph is based on only 57 responses to an open response question.

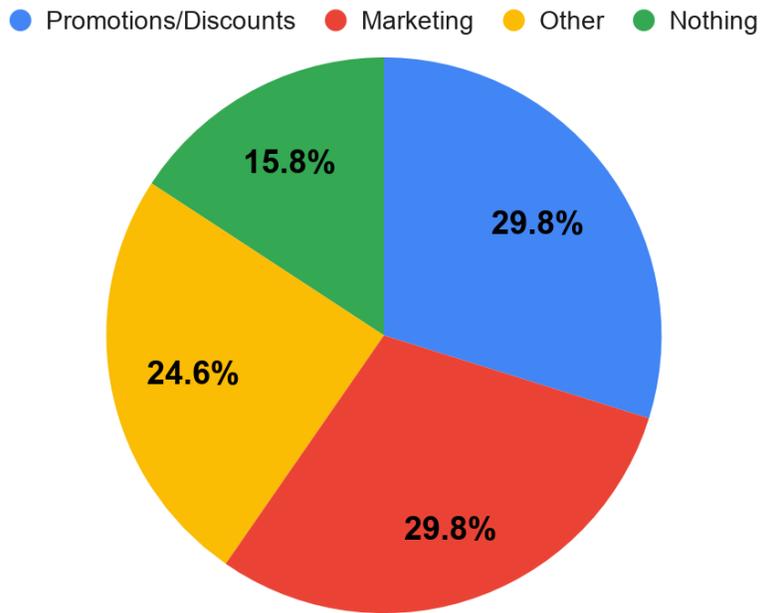


Figure 16. Other things businesses do to increase business during the shoulder season (n = 57).

#### 4.1.8 Chamber of Commerce Suggestions

We asked businesses what they think the Chamber of Commerce should do to promote the shoulder season. Figure 17 shows that most businesses want some form of action to be taken by the Chamber whether that be new events (24.4%), marketing (30.8%), or something else (24.4%). Some specific examples that businesses want the Chamber to do is promote existing events better, concentrate on other parts of the island other than downtown, and advertise that the island still has businesses open. A sizeable number of businesses (20.5%), however, suggest the Chamber does enough already and does not need to do any additional events or marketing.

● New Events/More Events ● More Marketing ● Other ● Nothing

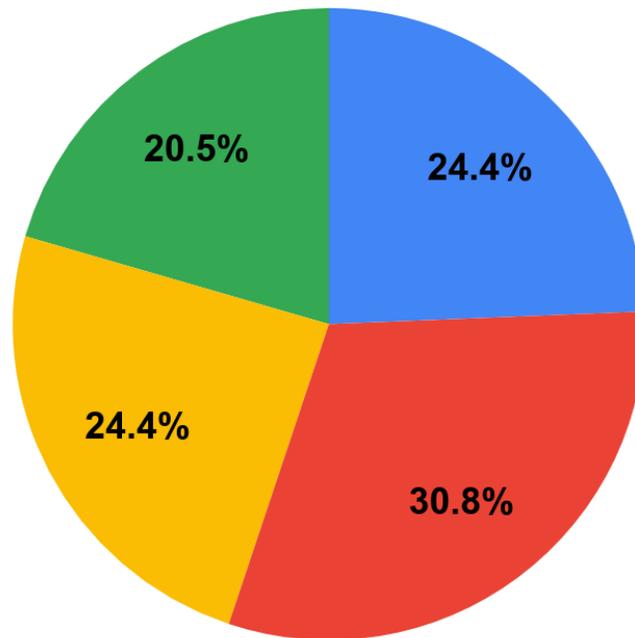


Figure 17. What the Chamber should do to promote the shoulder season (n = 78).

## 4.2 Business Interviews

We conducted interviews with 19 business owners to gauge the level of support for an events/calendar app and to clarify what features to include. The consensus among interviewees was an application that would connect businesses with tourists and consumers who frequent the island during the summer and who live on the island would help increase traffic to Nantucket during the shoulder season. Features that business thought would be most useful included: an integrated events calendar from the Nantucket Island Chamber of Commerce website, a page that shows current promotions that businesses are running and a way that consumers and tourists alike can purchase products through the application. We incorporated an events calendar and a promotions page in the app but found that including a point of sale system (POS) applicable to all businesses was not feasible due to the diversity of POS systems in use. Interviewees emphasized that effective marketing by the Chamber will be key to the success of the application and website in the future. Many business owners noted that previous apps had failed to reach their potential as a result of inadequate marketing and promotion.

### 4.3 Web and Mobile Application

The features included on the website and mobile application were influenced by the data that the group collected in the business survey and through the business interviews conducted on the island.

A diagram of the system is shown in Figure 18. These different applications are marked in red, and the entities that utilize the applications are marked in yellow. An application with a number of moving parts has the ability to become complicated. The Nantucket Island Chamber of Commerce will be able to manage which businesses have access to the web-based “admin” application. The businesses will then be able to access the same panel to manage their business and only their business. The data from both the Chamber and businesses are sent to Firebase. The public-facing tourist application takes the appropriate data and displays it to tourists through the web application and the mobile application.

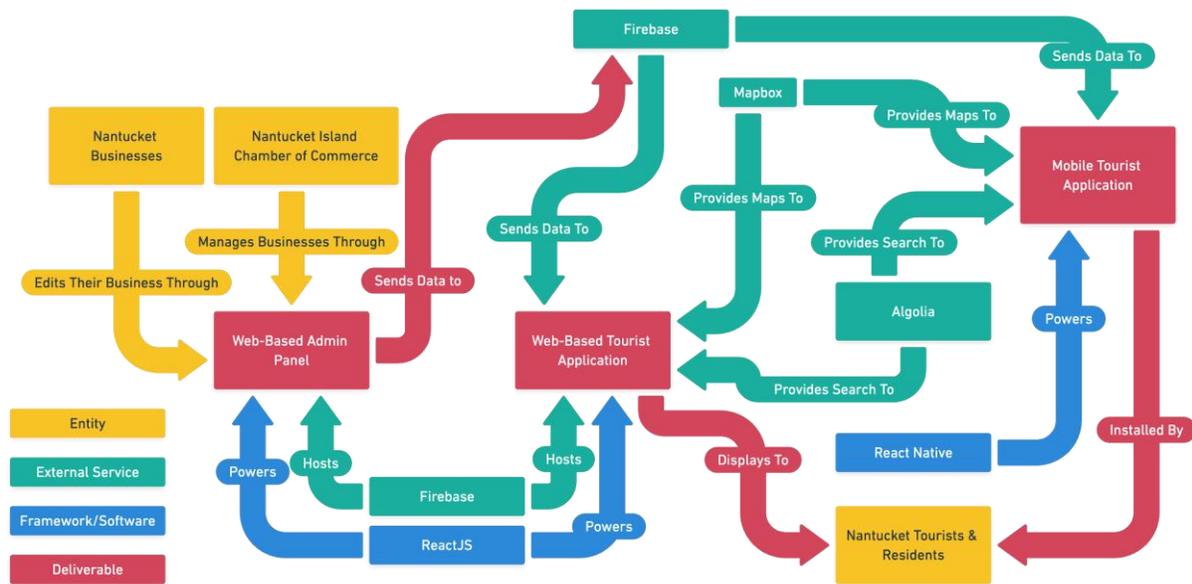


Figure 18. Flowchart of system interactions in the application

#### 4.3.1 Application Design & Features

Regarding the application’s look, feel, and features, we wanted to create an experience that was easy to use, and covered all the tourist’s and resident’s needs and requests. To provide the best experience for the mobile application we created a simple design that uses a dark blue

background with contrasting white block as shown in Figure 19, and for the website we went with a light white theme.

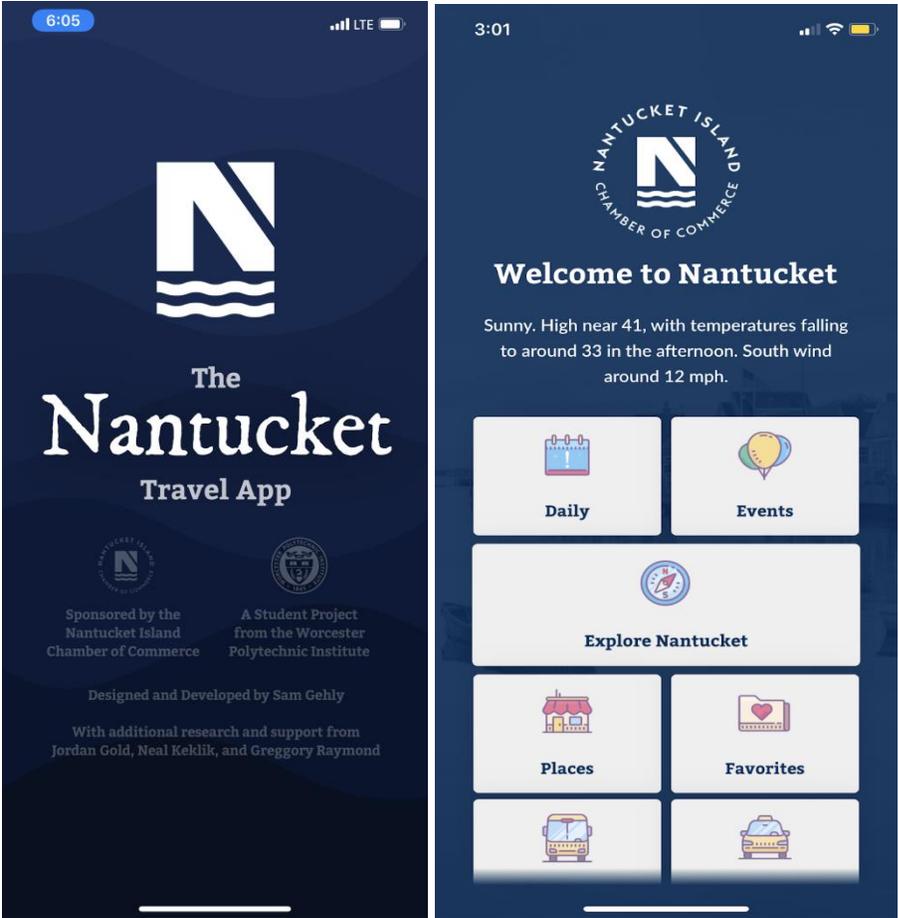


Figure 19. The mobile application splash screen and home screen.

In order to give potential visitors and residents insights into what is happening on the island on any given day, we wanted to include an overview of the events, promotions, and businesses open or running. We called this feature “Nantucket Daily”. Businesses also show current promotions that are running, links to their website, directions through Google Maps, a way to call the restaurant inside the app, and the hours of operation, as shown in Figure 20 for the mobile application and Figure 21 for the website.

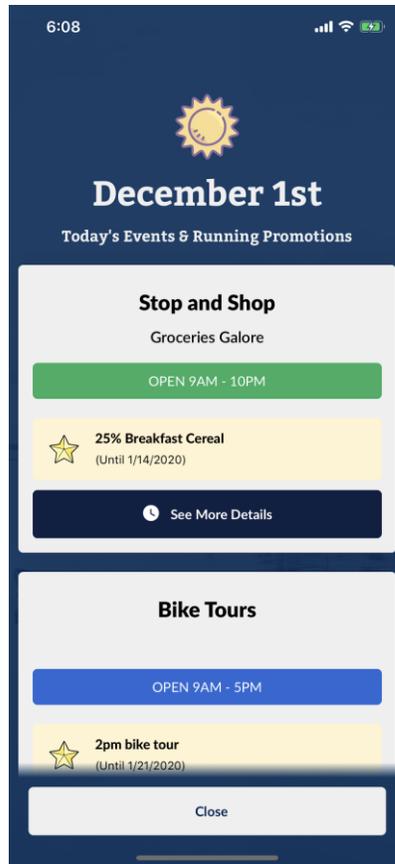


Figure 20. The “Daily” tab of the mobile application

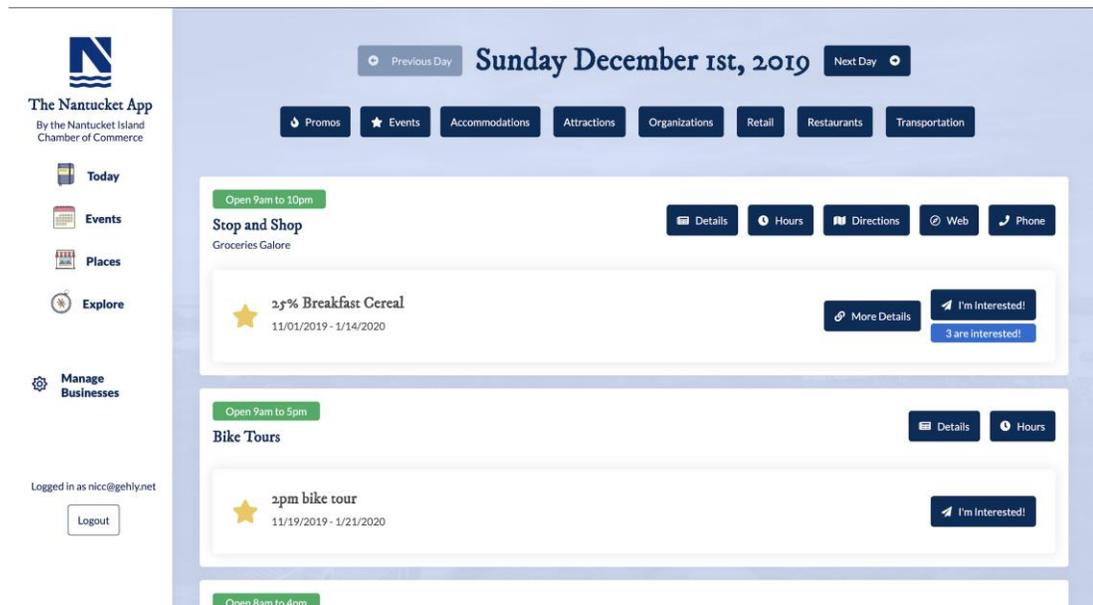


Figure 21. The “Today” tab of the website.

We also wanted a searchable directory of events in order to allow visitors and residents to discover events that interest them and add them to their trip, as shown in Figure 22 for the mobile application and Figure 23 for the website.



Figure 22. The “Events” tab of the mobile application

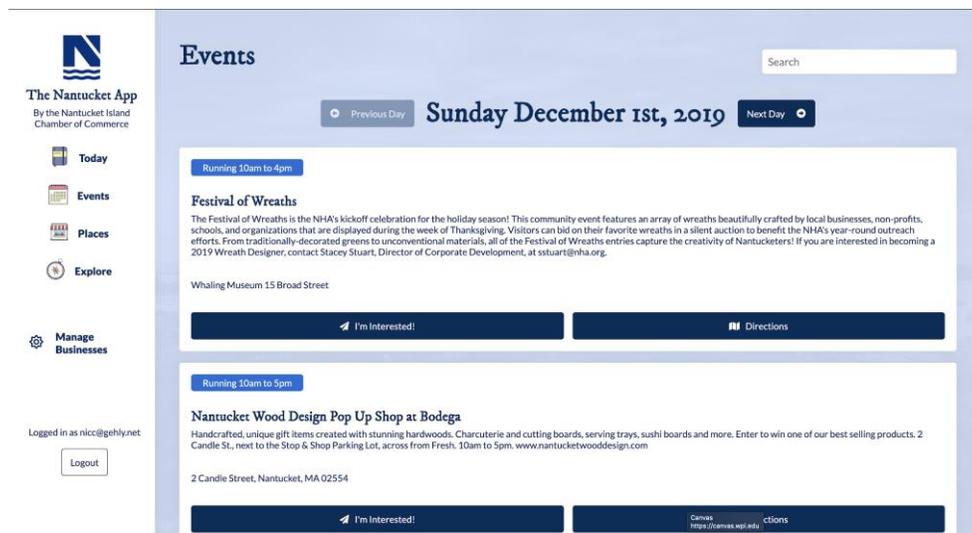


Figure 23. The “Events” tab of the website.

In order to show a lively and active island, even in the off-season, we included an interactive map that shows all of the island’s happenings to place events and businesses in the context of location as shown in Figure 24, alongside other location-based information on mobile (WAVE stops and live vehicle locations, for example) in order to fill out the map more, as shown in Figure 25.

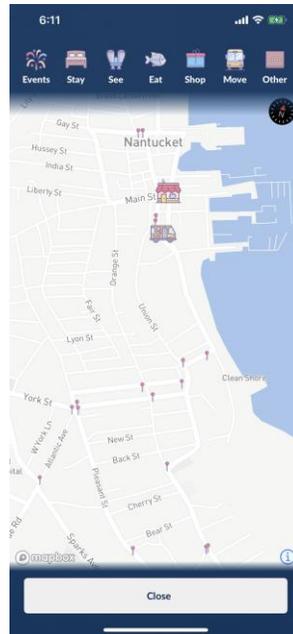


Figure 24. The “Explore” tab of the mobile application.

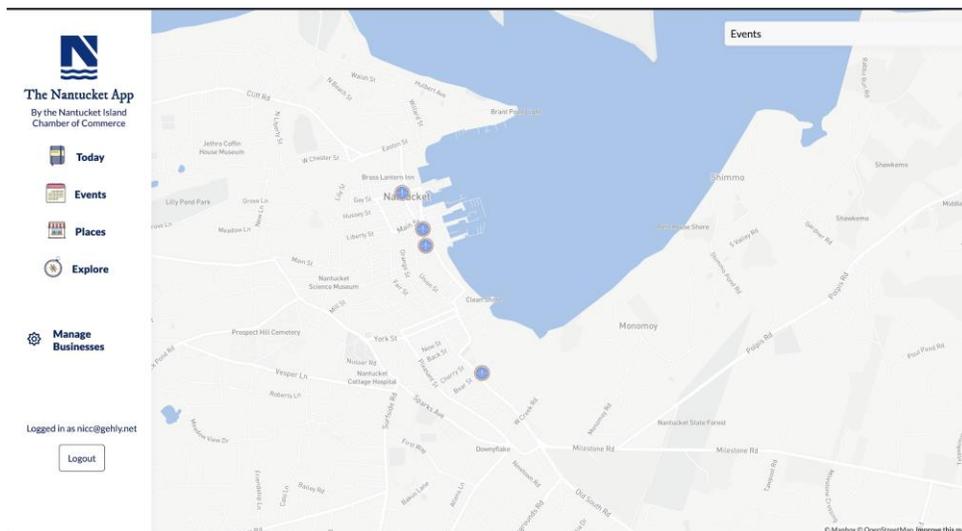


Figure 25. The “Explore” tab of the website.

Similar to events, we wanted a searchable directory of businesses so users could have easy access to specific businesses they wanted to learn more about, as shown in Figure 26 for the mobile application and Figure 27 for the website.

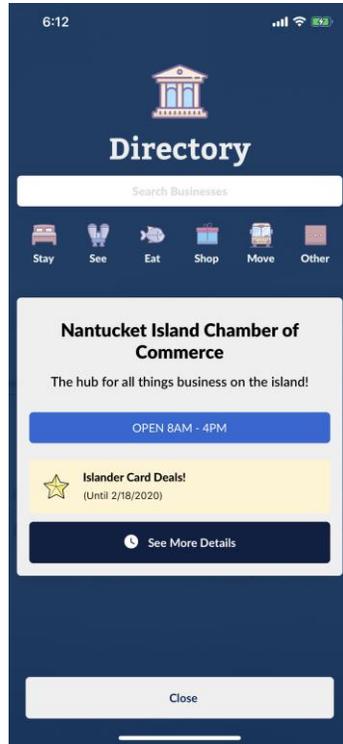


Figure 26. The “Directory” tab of the mobile application.

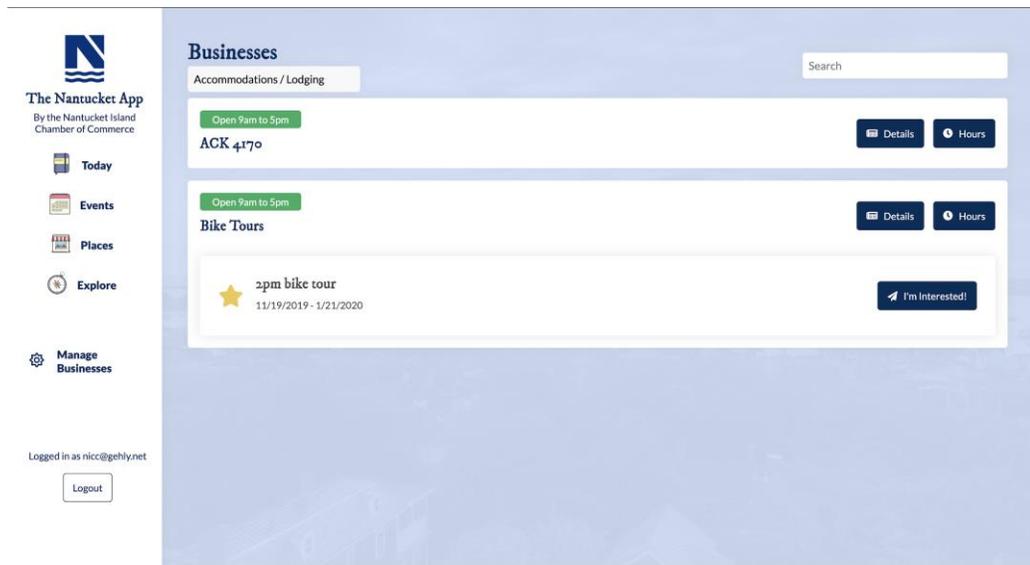


Figure 27. The “Places” tab of the website.

The last of the main features we included (on mobile only) was an interactive trip planner (called “Favorites” to appeal to residents as well) so residents and potential visitors could add things they find interesting for later reference, perhaps while on the island, as shown in Figure 28.

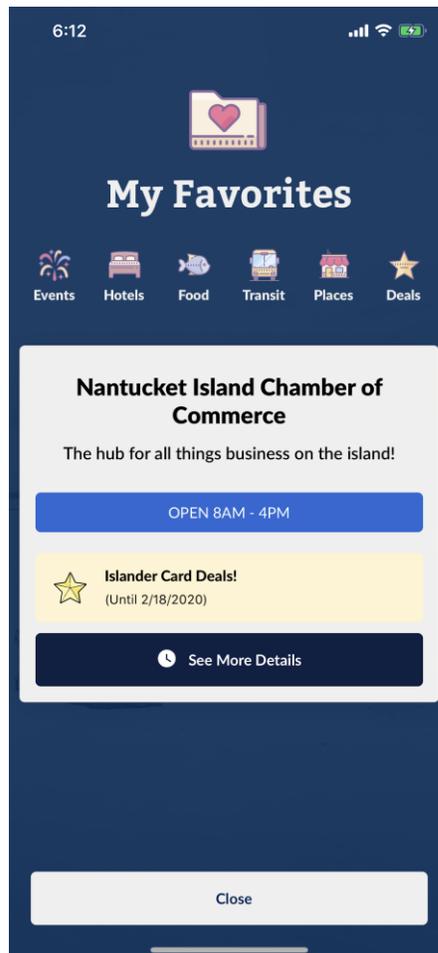


Figure 28. The “Favorites” tab of the mobile application.

A large part of our mission is to encourage business and traffic in the off-season, so we created a few features in the application that would make visiting the island easier, like the ability to book a flight or a ferry from within the app. In addition, we wanted to make the on-island experience better in the application to encourage repeat visits. We accomplished this by including a live map of the WAVE bus vehicles and upcoming stops within the app, and call a cab on the island, as shown in Figure 29.

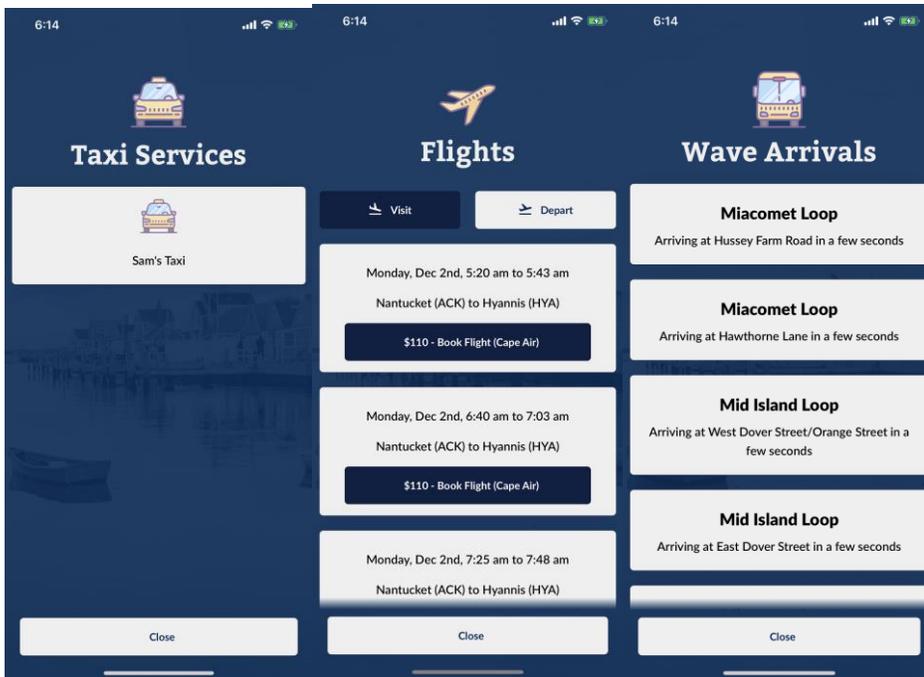


Figure 29. Location-based application features, including taxi services, flight listings, and The Wave arrival times.

We also included a virtual Islander Card, a program for Chamber members to receive discounts at select businesses on the island, as shown in Figure 30.



Figure 30. The virtual Islander Card.

In order to manage select features of the mobile application, some configuration on the part of the NICC is necessary, including keeping a list of running taxi services accurate, and keeping ferry schedules updated. While we attempted to remove the need for this manual configuration, due to the limited amount of data available on these two services, we were unable to automate the gathering of this information. In addition, we enabled push notifications on the mobile application for the NICC to use as a marketing tool for hallmark events, sales, or general updates. These push notifications can be sent out via the admin panel. The administration panel of these features can be seen in Figure 31.

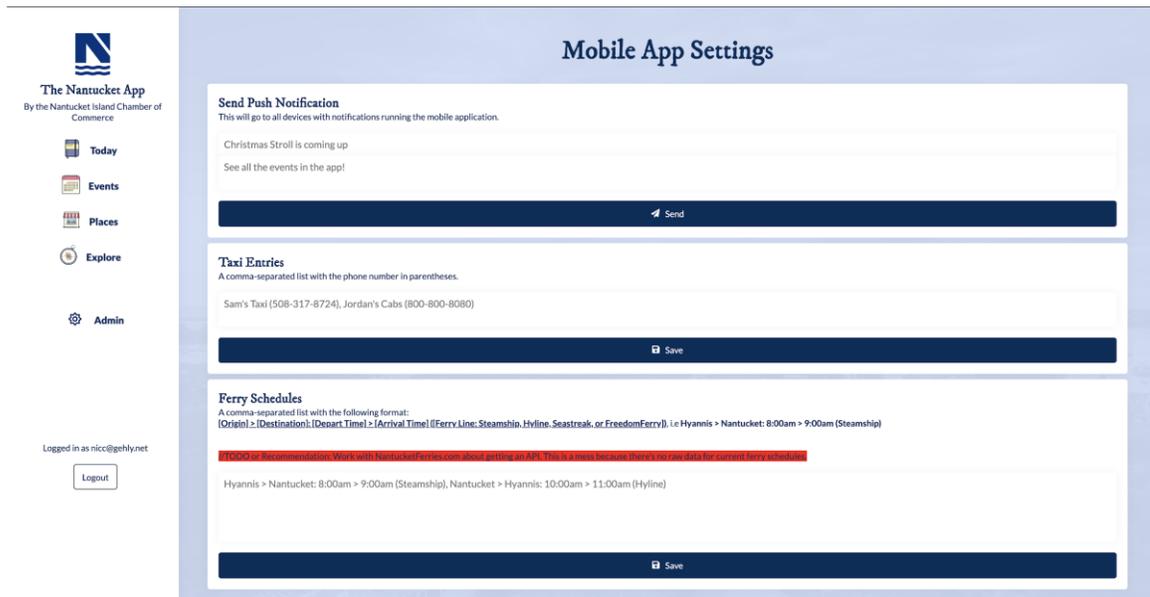


Figure 31. Settings for the mobile application managed via the website.

There is also the need to manage the content on the application by both businesses and the NICC. This involves editing business information, operating hours, and promotions. These tools can be seen in Figure 32.



Figure 32. The “Manage Businesses” screen where the NICC may add, edit, or delete businesses.

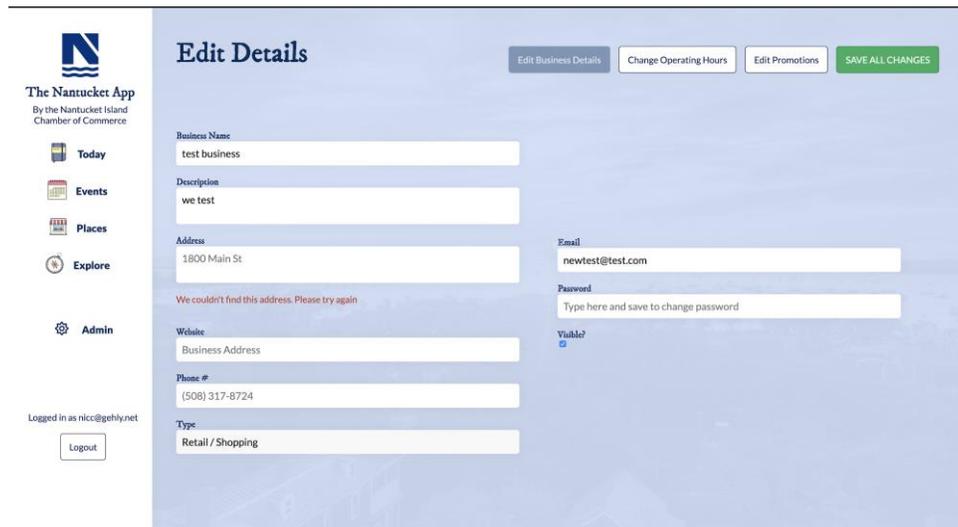


Figure 33. The “Edit Details” screen where the NICC or the business may edit details about their business, including name, description, address, website, phone number, and category.



Figure 34. The “Edit Operating Hours” screen where the NICC or the business may edit when the business is open in a calendar view.

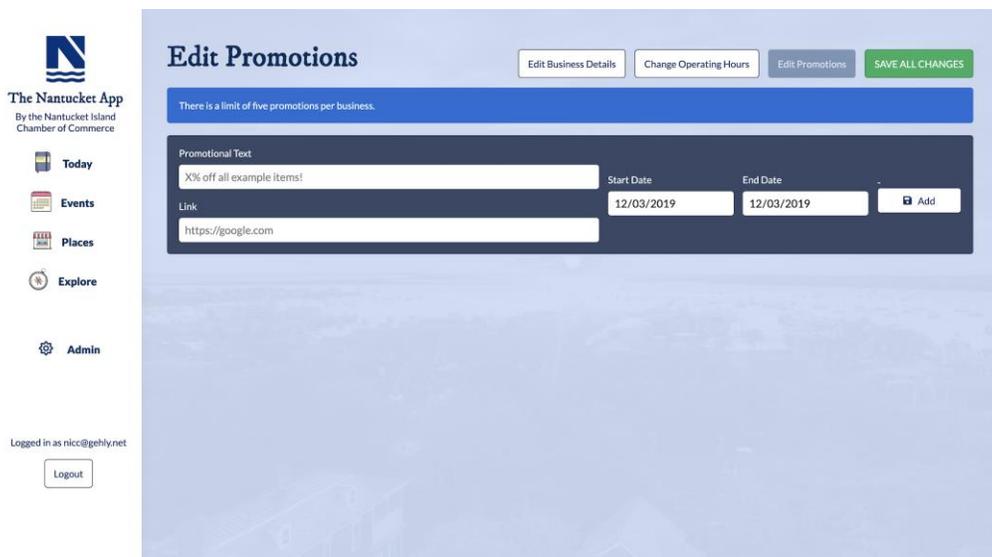


Figure 35. The “Edit Promotions” screen where the NICC or the business may add, edit, or delete promotions the business is currently running.

### 4.3.2 Design & Technical Implementation

For the design process we used an industry-standard tool Sketch to deliver web and mobile user interface (UI). We decided to use Sketch as it is trusted by companies like Apple, Facebook, and Google (“Sketch - The Digital Design Toolkit”, n.d). Said mockups covered all the included screens and will be the baseline deliverable for the NICC.

To ensure that we provided the NICC with a well-designed and robust application, the mobile portion for iOS devices followed the Apple Human Interface Guidelines, while Android devices followed the Android Design Guidelines, also known as Material Design. For the web, we used Bootstrap, a modern UI framework.

We wrote the web-based “admin” panel in React, a framework developed by Facebook. We chose React as it is used by companies all over the world like Capital One, eBay, and Netflix (“Companies that Use React.JS in the Bay Area”, 2019). Furthermore, we identified React Native as the best choice for the mobile portion given the seven-week timeframe we had to develop the application. React-Native is trusted by companies like Uber, Skype, and Pinterest (“Who’s Using React Native?”, n.d). These are marked in blue in Figure 18 and power the deliverables.

### 4.3.3 Other Services

In order to keep the application as efficient, robust, low-cost, low-maintenance, and secure as possible, Google’s Firebase was the best choice for the database and hosting needs of the applications, the data being the businesses, promotions, events, and news articles that the NICC manages through the admin panel. Firebase is used by companies like The New York Times, The Economist, and Shazam (“Firebase Use Cases”, n.d). In addition, we identified Mapbox as a suitable provider for the applications’ virtual maps, trusted by Facebook, Snapchat, and Foursquare (“Built with Mapbox”, n.d). Finally, we identified Algolia as the provider for search functionality, being used by companies like Twitch, Slack, and Birchbox (“Algolia - Fast, Reliable, and Modern Search”, n.d). We provided an analysis to the NICC that involves the cost of all of these different services in the context of this project. If assistance is needed, we encouraged them to reach out to a technical consulting firm. These services are marked green in Figure 18.

### 4.3.4 Maintenance/Cost

There may be a need for maintenance and continued development upon completion of the project before the applications are released to the public. If that is the case, there will be a need for support from a 3rd-party entity in order to complete the applications. If the application is in a state that is ready for release to the public upon completion of the project, and there is no need

for a third-party agency, maintenance would be limited to ensuring payment details are accurate on all of the aforementioned third-party services (Firebase, MapBox, and Algolia), to ensure there is no interruption of the services they provide to the application.

We discovered that pricing from Google Firebase may be a bit higher than anticipated, but not to the extent that the NICC must concern themselves with budgeting. We currently expect, with moderate traffic, the application charging the Chamber no more than \$75 per month to maintain. Of course, as the three services we employ are usage-based, this will fluctuate based on usage and popularity of the applications, most likely on the lower end.

#### 4.3.5 Beta Tests

Once the first iteration of our website and application were completed, we contacted business owners, the president, and the vice president of the NICC to participate in beta tests. We identified 11 people willing to participate in the beta tests for the website and application from among our survey respondents and interviewees, as well as talking informally with local businesses and our sponsor. We developed a set of tasks and questions for beta testing (see Appendix C). The beta tests were conducted on an in-person basis, where two to three of us went to the local business and conducted the test. During each beta test, the business owner was given a copy of the application and website from our phones and laptops. They were asked to not only critique the data entry portion, but also the usability, look, and the various features on the app. The questions were also geared towards any bugs or fixes that needed to be addressed. From the beta testing we discovered a few things to make the application and website more user friendly and efficient for businesses and tourists to use. For example, we created a more organized home page based on the comments we received from business owners. Some business owners were “intimidated” by opening the original version of the app and immediately going to the today page. They were not sure where to start and thought there was too much going on when you open the application. Now, the home page offers different tabs so the user could pick where they want to go on the app. Weather updates were also embedded into the home page instead of having a separate tab. The evolution of the home page can be clearly seen in Figure 36 and 37 below. Font and color scheme for the app was another major critique that we received, therefore, we increased the color contrast and we changed the original font to a more readable one. These changes can also be seen in the two figures below. Lastly, we received feedback on the data

entry portion of the website, especially the business calendar. Many business owners had trouble locating where to enter and set their hours. Thus, we put a greyed-out message saying “enter hours here” so it was clear where to put them in and moved the buttons to set business hours to the top of the calendar instead of the bottom.

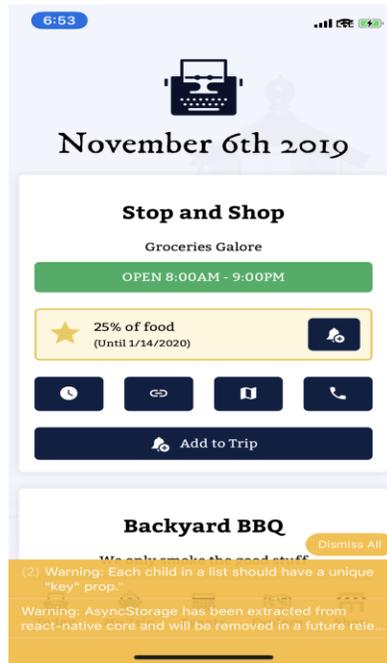


Figure 36. Lack of a home page and immediately going to the today tab.



Figure 37. The finished home page for the app.

## 5.0 Conclusions

Conducting business interviews and beta tests as well as a survey with business owners revealed items the Nantucket Island Chamber of Commerce should focus on in the future. It is clear after interviewing business on the island that the summer months exhaust business owners' time and resources due to the large influx of people. Thus, the time during the shoulder seasons are viewed as a break from the hectic summer rush. By contrast, some businesses view the shoulder season as an opportunity to increase sales and would rather see the island busier. We took both positions into consideration and have designed the applications to not only attract more consumers to the island for businesses that want more activity, but also added features that residents can utilize daily.

A recurring issue that our team observed throughout our project was keeping the data on the application and website current. If business hours or promotions on the smartphone application are not up to date, it would drive away users from the applications. Even more fatal is that presenting information that is not accurate could render the applications unreliable and thus unused in the future.

When we discussed the development of a mobile application and website with business owners almost all interviewees said that the product would have to be marketed aggressively in order to be successful. Regardless of the features of the application, the product would not simply fall into the hands of the consumers without proper marketing. Therefore, efforts must be applied towards marketing the application by the NICC and other stakeholders. This is essential because without enough marketing the application will not gain traction.

For example, one problem that the island of Nantucket faced was finding a taxi during the busy summer months when tourism was at its peak and the population of the island was highest. Uber was one company at the time that had solved this problem. However, Nantucket did not like to see business being diverted away from the taxi companies on the island to big companies like Uber and Lyft. Therefore, they wanted to create a similar smartphone application that consumers could use to order a taxi, from one of the Nantucket businesses, instead of them using Uber or Lyft to do so. The smartphone application failed because it was trying to compete for business in an area that was dominated by big name rideshare companies such as Uber and Lyft. Furthermore, our business interviews revealed that the application, tACKzee, was not properly marketed towards the consumers on Nantucket. They also revealed that the information on

tACKzee, was not up to date and therefore pushed consumers away from using the applications. Without any sufficient marketing or relevant information, the applications did not gain the proper amount of traction to compete with the big-name companies on island, such as Uber and Lyft.

Our business interviews also highlighted that marketing should target two target audiences, businesses and consumers. The first are businesses who run promotions and post their business hours on the mobile application. The second target audience are tourists and consumers who download the application. Marketing efforts directed at business owners, however, will be different than the marketing efforts for consumers and tourists who use the mobile application.

Our last conclusion is that business owners may be intimidated by the maintenance they have to perform, namely updating hours, promotions, and business information. The more frustrated they become the less they will use it. Therefore, it was clear that we had to design the application so that it is intuitive to use. The project would also benefit from the design of training videos that the NICC could use to instruct business owners on how to use the business-facing portion of the website.

## 6.0 Recommendations

In this section we will provide recommendations for the Nantucket Island Chamber of Commerce based on the previous conclusions that were made. We will explain everything from the importance of keeping information accurate, adding more events to the shoulder season, how the NICC should market the application, training materials that the NICC should use to teach businesses, and the general upkeep of the application after we leave the island.

### 6.1 Events

Our first recommendation is that the NICC takes into consideration how many events they schedule throughout the shoulder seasons as well as the off season. They should also gauge the popularity of each event before advertising the events to the public. It is hard to accommodate both opinions of businesses about events, but this should not be a deterrent for finding a compromise. We also recommend that the Chamber encourage businesses to work together and network more to help make events more of a success.

### 6.2 Keeping the Application Relevant

The Nantucket Island Chamber of Commerce should also encourage businesses to update their hours months in advance on the application in order to ensure tourists can plan trips effectively. Our fear is that if a consumer or tourist opens the application on their phone to check hours for a business only to find out that the information is inaccurate then they will not use the application in the future. Therefore, it is strongly recommended that the Chamber remind businesses as much as they can to update their information regularly. They can do this with email reminders, at business after hours, events, board meetings or a combination of all these. This is something that the Chamber should do not only before the release of the smartphone application, but throughout the life of the website and mobile application.

### 6.3 Marketing to Businesses

Through business interviews our team learned that the success of the mobile application and website depends largely on how it is marketed. We recommend that the NICC first market to business owners so that they can load relevant and accurate data before consumers download the application on their phones. If the consumer and tourists open the application to find that

business hours and promotions are not accurate, they will delete the app and it will be much more of a challenge to get them back. One way that the Chamber can market to business owners is through sponsored events such as business after hours. During this event the NICC can introduce the application and website to business owners as well as show them how to load information into the applications. Rollout of the mobile application and website is also important to consider when thinking about marketing. The website will be made public first to business owners so that they can load their business information in preparation for the release of the mobile application to consumers and tourists. The website should be public in the beginning of December and the smartphone application should be released when the Chamber thinks all businesses are sufficiently trained in how to use the website and when they think that the information on the application is accurate.

#### 6.4 Marketing to Consumers

After marketing to businesses and ensuring that sufficient current information about business hours, events, and promotions is loaded on the application the Chamber should then begin marketing to consumers. The NICC can market the application to consumers and tourists through digital advertisement on the ferries and airlines, on commercials at Dreamland movie theater, through the Chamber's website, and through advertisement in newspapers such as, *Yesterday's Island*. The Chamber should also consider marketing through the network of tourist information centers throughout the state. Developing a rack card about the app and distributing it widely on and off the island, might be an effective option also.

#### 6.5 Training Materials

It is clear from beta test and interviews that business owners may be hesitant about using the applications to advertise their business on if they do not fully understand how it works. Therefore, we recommend that the Chamber inform business owners on how to navigate the website and update their business information. This is vital to ensuring that information on the applications is accurate and more importantly ensuring that businesses have the confidence to use the application regularly. Hosting training workshops would have been an option for our team but would not allow us to reach a significant number of business owners easily. We opted

instead to make training materials for the Chamber. These training materials consist of three training videos for the Chamber of commerce that outline specific features that businesses would have to use on the website. The topics for these videos are how to edit business details, edit promotions, and how to add business hours. These videos will be made available to the Nantucket Island Chamber of Commerce when the mobile application and smartphone applications are handed over.

## 6.6 Future Iterations of the Smartphone Application

Despite having produced a finished smartphone application and website for the Nantucket Island Chamber of Commerce there is always more that can be done to make it better. In order to improve and maintain the applications and website the Chamber should hire a design and development agency for fixing bugs, adding new features, and optimizing the app. A majority of the design features described in this section are taken from beta tests but were not touched upon due to the limited amount of time on the island. The design agency should fix known bugs, including push notifications on Android and event syncing with Chamber events. They should also work with ChamberMaster to add tags to events, like “Free,” “For Kids,” “Classes,” “Workshops” and other categories. This agency could also change the icons on the map depending on category, as well as create a category on the map and create a tab that contains recreational activities like beaches, parks, etc. The next iteration would include optimized categories businesses could choose from and allow businesses to pick multiples of them if they wish. In terms of user interface, the next iteration could include turning the category buttons into a dropdown everywhere they exist. Furthermore, the Chamber should work with NantucketFerries.com to maintain an updated, relevant API for ferry schedules so that the Chamber does not need to maintain them. Lastly, the agency that the Chamber decides to pick should import “Hot Deals” as promotions from ChamberMaster if possible as well as clean up the codebase as creating three apps in five weeks produces some messy code.

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## Appendix A: Business Survey

*We are students at Worcester Polytechnic Institute conducting research in collaboration with the Nantucket Island Chamber of Commerce. We would be grateful if you would take 5 minutes to answer a few questions about conducting business in the shoulder and off-seasons. If you have any questions about the survey or our research, please contact us at gr-ACK19NCC@wpi.edu.*

*-This survey is anonymous; no personal or identifying information will be collected.*

*-This survey will only take about 5-10 minutes.*

*-Your participation in this survey is entirely voluntary.*

*-You may end your participation at any time.*

*-You can skip any questions you prefer not to answer.*

If you would like to proceed, please select 'yes' below.

(Yes no)

1. What type of business do you own/operate? (Multiple choice)

Accommodations (e.g. Hotels)

Activities (e.g. Yoga, sailing classes, etc.)

Arts / Culture (e.g. Art Gallery)

Food and Dining (e.g. Restaurants, Bars, Cafes)

Retail (e.g. Shops)

Services / Transportation (e.g. Taxi Company)

Weddings / Functions (e.g. Function Hall)

2. How many full time employees or full time equivalents do you typically employ during the peak season (July, August, September)? (Multiple choice)

1-3

4-6

7-12

13-25

25+

3. How many years has your business been operating on Nantucket? (Number)

4. What part of the island are you located? (Multiple choice)

Town / Brant Point

Mid-Island

Cisco / Hummock

Cliff / Dionis

Madaket

Monomoy / Shimmo / Shawkemo

Pocomo / Quidnet

'Sconset

Surfside / Tom Nevers

5. During what months does your business typically operate? (Multiple choice)

Year Round

January

February

March

April

May

June

July

August

September

October

November

December

6. How many full time employees or full time equivalents do you employ during the shoulder season (April, May, June, October, November, December)? (Multiple choice)

1-3

4-6

7-12

13-25

25+

7. With regard to your business, please indicate how strongly you agree/disagree with the following statements. (Group)

8. What events do you typically stay open for in the shoulder and off-seasons? (Multiple choice)

All Events

Christmas Stroll

Daffodil Festival

Cranberry Festival

Figawi Race/Memorial Day

Wine and Food Festival

Nantucket Book Festival

Nantucket New Year's

Thanksgiving Week

None

9. How strongly do you agree/disagree that more "hallmark events" (i.e. large events focused on a theme such as Christmas Stroll) would boost business during the shoulder seasons? (Opinion scale)

10. Please indicate what new events or promotions might boost business in the shoulder seasons? (Short text)

11. Please indicate how important the following are for increasing your business during the shoulder seasons? (Group)

12. Is there anything else you do to increase business in the shoulder seasons? (Short text)

13. Would knowing what other businesses are open or closed on the island influence your decision to open or close? (Yes no)

14. The Nantucket Island Chamber of Commerce is developing an app and website to promote shoulder season visitation and business. Please indicate below how important you think each potential feature in the app and website might be to you and your customers? (Statement)

15. Please indicate below how important you think each potential feature in the app and website might be to you and your customers? (Group)

16. What percent of your customers do you think would use the app and/or website? (Multiple choice)

0 - 25%

25 - 50%

50 - 75%

75 - 100%

Not sure

17. The Chamber does a lot to help with shoulder season such as Christmas Stroll. What other things do you think the NICC should do to promote the shoulder season? (Short text)

18. Would you be willing to either participate in an interview or beta testing of the application? (Yes no)

## Appendix B: Business Interview

*This interview will take approximately half an hour to complete. Your participation in this interview is completely voluntary and you may stop at any time. We shall be taking notes during our conversation and may wish to quote you in our final report. Do you mind if we quote you by name, or would you prefer we anonymize your responses? We will, of course, give you an opportunity to review any quotations prior to publication. We will also be happy to provide you with a copy of our report when it is completed. Do you have any questions before we begin? If you have any concerns or questions after the interview, you can contact us at gr-ACK19NCC@wpi.edu or our faculty advisor, Dominic Golding, at [golding@wpi.edu](mailto:golding@wpi.edu)*

1. Do you stay open during the shoulder season or off-season?
  - a. Off-season is (Jan - March), first shoulder season (April - June), peak season (July - September), second shoulder season (Oct - Dec)
2. (If yes) What motivated you to stay open during the shoulder or off-season?
3. (If yes) Do you offer any special discounts for Nantucket residents?
  - a. Are you willing to hold events during anytime of the year?
  - b. Have you held events in the past and have they been successful ?
4. (If no) Why do you close during the shoulder or off-season and what might motivate you to stay open?
  - a. If other businesses in your industry were open would this motivate you to stay open as well.
5. Has your business thought about online services?
  - a. ACKEats
6. Do you think the chamber is doing enough to promote seasonal events?
  - a. (If no) What do you think the Chamber should do to encourage more people to visit in the off-season? (Traffic)
  - b. (If yes) What are they doing well
7. Do you think an online calendar showing dates and times of when businesses are open and closed would help to encourage travel to Nantucket?
8. (If yes or strongly opinionated) Are there any potential features you think would go well with the online calendar?

9. Have you employed successful marketing ideas for your business and if so what were these strategies and could they be useful towards the marketing off a smartphone application?
10. What business analytics would be interested in looking for from a smartphone application?
11. Would you be willing to participate in a beta test for our application?
  - a. gr-ACK19NCC@wpi.edu

## Appendix C: Beta Test Questions

*Your participation in this beta test is completely voluntary and you may stop at any time. We shall be taking notes during our conversation. These notes will be kept anonymous. We will also be happy to provide you with a copy of our report when it is completed. Do you have any questions before we begin? If you have any concerns or questions after the interview, you can contact us at gr-ACK19NCC@wpi.edu*

- Have you used any other types of calendar applications for planning vacations before?

*At this point the app will be presented to the participants.*

- (Smartphone Application) Please find the business hours of the, “Nantucket Island Chamber of Commerce”?
  - *The purpose of this question is to determine how intuitive the smartphone application is*
- (Website) Please enter your business data?
  - *Again, this will gauge how intuitive the website is and how easy it for business owners to navigate the website*

*The participant will now have time to experiment and test the application out.*

- Is there a friendly user experience?
- Are there any features you can think of to add?
- Is there anything you think isn't important?
- How would you market the application to businesses?
- How would you market the application to consumers?
- Any final questions or comments about the application?

## Appendix D: Maintenance Plan and Costs

As per our recommendations, the NICC should consult with a third-party agency to further develop and maintain the application. Payment methods must be kept up to date on the aforementioned third-party services (Apple, Google, Firebase, Algolia, Mapbox, etc.) in order for the app to remain functional. Excluding the one-time or yearly fees from Apple and Google for publication of the app to their respective stores, we estimate the monthly cost to the NICC to be no more than \$100 per month, dependent on usage, with most of the cost originating from Firebase's database.