Evaluating Changes in the Venetian Retail Sector and Managing its Use of Public Space

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Abstract

The resident population is declining, and tourism is rising in Venice. At the same time, neighborhood shops are   closing, and tourist stores are opening, which impacts the local population. To analyze these changes, our team developed applications to collect, visualize and analyze data on the retail sector. Our analysis showed increasing encroachment into public space by shops' *plateatici*. To address this, we developed an online system for managing and enforcing retailers' rental of public space.

Executive Summary

Venice is a small city that spans approximately 6.3 square kilometers. Of this area only approximately 15% is available as public space and comes in the form of pedestrian walkways. These walkways are often cluttered and obstructed, however. Retailers, in particular, have consumed public space through their *plateatici, posteggi isolati,* markets, and street artists. *Plateatici*, refer to retail stores' lease of public space—for outdoor seating at cafes, signage, and displays that spill into the streets. This encroachment has caused a number of problems for the local population as it restricts traffic flow, creates noise, and obstructs views of scenic canals and historical monuments.


Plateatici / Posteggi Isolati / Market / Artist

Our study of the evolving retail sector, began with research into current Venetian demographics. The number of locals in the city peaked at about 174,000 during World War II and has dwindled to approximately 56,000 today. In addition to the declining residential population, the average age of the residents has continued to grow. While the Venetians are getting older or moving away, the number of tourists who visit the city every year continues to increase. This has led to a rise in visitor specific shops and a decrease in resident specific, neighborhood stores in Venice. Today, only a third of stores with sole-ownership are owned by Venetians. The tourist-oriented shops, such as bars and restaurants, also tend to infringe on public space since the majority of them tend to have plateatici. As local news articles, like the one shown below stating "Another mask store replaces a florist", Venetians are frustrated.

The team sought to inventory and classify the location and types of stores in one district, Cannaregio. To do this, we developed two applications: "Negozi", a mobile application for

documenting shop types and locations, and "Shopp Mapp App", a web app for visualizing and analyzing shop data collected by the team and data provided by the Chamber of Commerce.
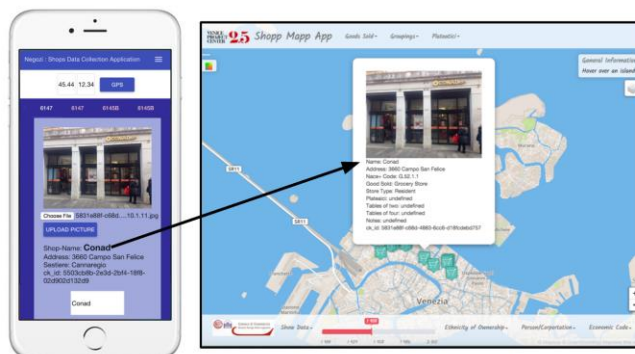
"Negozi" was loaded onto a smartphone to collect and update shop data around the sestieri of Cannaregio, home to over a thousand stores. With the mobile app in hand, our team covered the streets, recording each shop with a photo and GPS coordinates, checking the types of goods/services they sold, whether they had plateatici or not, and whether they were specific to tourists, residents, or both.

Since the results of this project are relevant and important to the local population, the team created Venepedia pages (Wiki-style pages on the VPC website) to make all of our data on the city shops publicly available.

This data was fed directly into another app we created, "Shopp Mapp App", that can visualize store and other data such as island demographics, on a map. It can facilitate analysis by allowing a user to relate variables such as hotels on an island to the types of stores located there. Or, by selecting for only the tourist-oriented stores on the map, the user can see that the vast majority of these types of businesses are located around major streets and entry points into the city, such as the train station and boat stops. In addition to filtering Venetian businesses by whether they are tourist specific, resident specific, or mixed, the application can also display stores by their goods sold—for example, it can show how many bars are in an area versus clothing stores. The map below shows all active stores on record with the Chamber of Commerce.
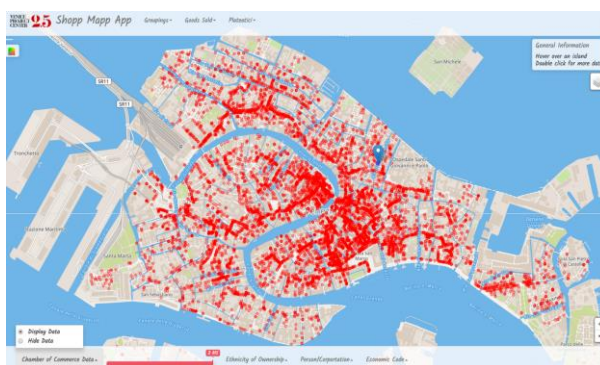

We also received and loaded into our app historical data on the Venetian retail sector from the Venice Chamber of Commerce. These records contain over 30,000 entries and go as far back

1924. However, since businesses were not required to register with the Chamber of Commerce prior to 1996, the entries before this year are not as accurate or complete. The team looked for obviously erroneous entries, like a store with a closing date of 2204, and removed them from consideration. The "Shopp Mapp App" can also display Venice Chamber of Commerce records by the year the business was active, ethnicity of ownership, economic code (a more general code than the one used by the Venice Project Center), and whether they are sole proprietor or corporate owned.

Analysis of these data in our app showed that the number of active businesses in the city is rising steadily, but does fluctuate with the number of tourists who visit the city, as shown below. This suggests that many stores in Venice may be dependent on or perhaps established in response to the rising tourist population.
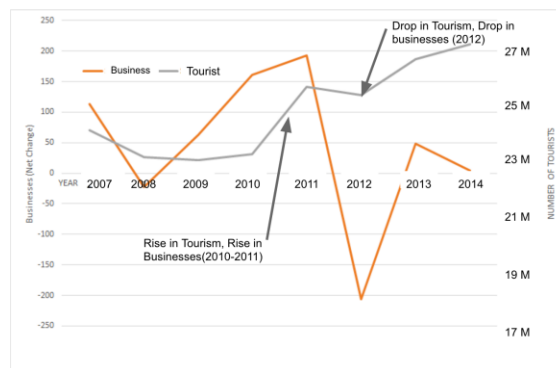
During our study, we found 257 resident stores, 220 tourist stores, and 332 mixed stores in Cannaregio. The majority of these stores are located along Strada Nuova, the main tourist route from the train station to the Rialto bridge. The data also showed that while the number of residents is going down, the number of resident grocery stores has been going up. By looking at the data on our map (below), we were able to see that these stores were now concentrated around Bed and Breakfasts, showing that the tourists may now be supporting resident stores
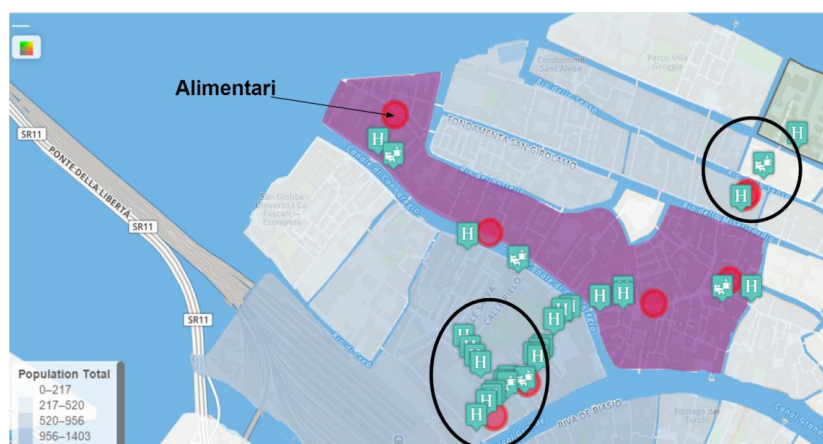

In addition, the team also looked at trends regarding specific economic codes and ethnicities of ownerships. We found that only a third of sole proprietor owned shops are now Venetian. Non-Venetians now control sales of some specific goods as well: only 12% of the

leather goods stores in Venice are actually owned by local Venetians. Outside ownership of stores in the retail sector, may be taking revenue away from the city.

Finally, the rise in tourism has contributed to an increase in bars and restaurants, and our data showed that 53% of all bars and restaurants in Cannaregio encroach on public space with plateatici, mainly through outdoor seating and menu displays.

To address obstructions and noise created by *plateatici*, the team studied the city's current system for renting outdoor space, and identified several problems with it; a lack of flexibility, a high level of arbitrariness, and difficulty in enforcement. The team developed an Online Plateatici Management System, OPMS, which was first outlined by Carrera, Gallo and Novello.[1]

The system can allocate and monitor the retail sector's use of public space in Venice, based on objective, data-driven principles. The system creates buffer zones to allow for both pedestrian movement and a zone of respect for historical monuments. It also allows for dynamic pricing of *plateatici*, as a store owner can choose exactly how much space they want to rent based on cost, which rises when the area they want to lease approaches areas of respect.
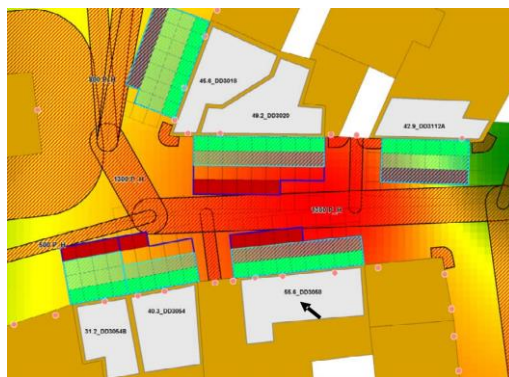
In order to make sure that the OPMS is followed we also recommended a system for enforcement that could be used to monitor effects on pedestrian traffic flows, noise levels, and views of historical monuments. The OPMS would also bring a level of transparency, allowing any local to know exactly the space each store is allowed to occupy. Our system would include:

- Use of cameras (pictured below) and pedestrian counting software installed in problem areas

- Use of Venice Noise App, an application for recording nearby sound levels, when repeated complaints are issued

- Adding the ability to make noise and encroachment complaints about *plateatici* in IRIS, Venice's complaint system.

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[1] (Carrera, Gallo, & Novello, 2006)
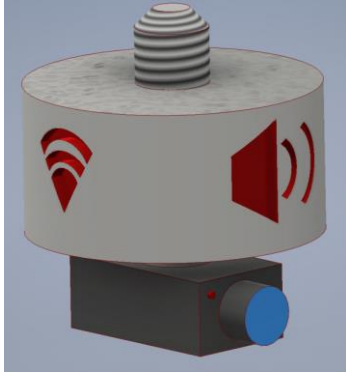
With the two applications for collecting and analyzing information on the retail sector, and the proposed system for renting and monitoring retail use of public space, the city can more effectively understand and manage the evolution of the Venetian retail sector in response to tourism and its effect on locals.

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1. Introduction

Nobody goes there anymore; it's too crowded

– Yogi Berra

The rapidly shifting demographics in Venice reflect similar changes in the retail sector. Venice is transitioning into a city for tourists, not for residents. As local Venetians begin to leave, so too do the small specialty shops that catered to them. Disappearing are the small butchers and flower shops, the corner pharmacies and newsstands. Now the city is covered in shops that cater to tourists—bars and trinket shops, which fill the city with their tables and the noise of their boisterous patrons, and crowded kiosks that block the street. Outdoor seating, signage, and other shop related structures spread into what little public space Venice has. The retail sector's use of public space encroaches on the space Venetians need to walk to work, and gather with neighbors, a downside Venice cannot afford to suffer.

The city is becoming increasingly difficult for residents. A walk to the grocery store is no longer a matter of going around the corner; now a resident might have to cross several bridges to get to one. And with more bars and restaurants opening every day, and throngs of pedestrians blocking the walkways, that walk may no longer be as easy as it once was. The compounding effect of fewer resident stores, and increasing impediments from tourist stores, is making it less desirable for local Venetians to continue living in Venice.

The Venetian government has attempted to combat some of these effects. Plans have been drawn up to regulate the amount of public space that businesses can use, in order to protect historical sites and allow for pedestrian mobility. These general regulations for public space, and specific plans for more populated areas (*pianini*) are also meant to cut down on the amount of noise patrons of these businesses make at night. Unfortunately, these efforts have not been enough, as these problems continue to plague the Venetian public. It is a challenge both to set these regulations in non-arbitrary ways and to enforce them, and to enforce them, and currently penalties have not been enough to dissuade businesses from breaking the rules.

The Venice Project Center (VPC) has, since 2004, completed detailed studies of the Venetian retail sector, capturing how it has changed over the years. These studies have documented residents' discomfort levels with retail changes and growing tourism. They have also begun to gather data on the location and types of shops in Venice, providing a method and starting point that others can use to capture the current state of the retail sector and to better understand its impact on locals and how the city can manage the negative effects associated with the retail sector's impingement on public space. With the rapid change in the retail sector of Venice, frequent samples are necessary in order to properly analyze the data, however.

The goal of this project was to address these needs, to update the data on the shops of Venice, gathering records of their goods, location, and other attributes, in order to get a better understanding of the trends that have been occurring in the Venetian retail sector. This project was intended to capture the changing face of the retail sector in Venice and to alleviate the impact

of its commercially leased public space on noise pollution and pedestrian traffic flow. It resulted in an updated inventory of shops, as well as an evaluation of the use of public space and subsequent recommendations for managing it effectively.

2. Background

According to Venetian legend, the city was formally founded on March 21st, 420 AD, after the collapse of the Holy Roman Empire.[2] Following its establishment, the city quickly grew into a large commercial power whose influence extended across the Adriatic Sea.[3] Although the great Venetian empire saw its rise and fall, the city still remains a great cultural and historical treasure that attracts countless visitors from around the world. This influx of tourists has created a number of problems for Venice, however most notably noise pollution and pedestrian traffic congestion. The main focus of this project is the way that the growing retail sector is using public space and the problems this encroachment present to in the city. This chapter overviews Venice's unique infrastructure which only exacerbates these problems. It also identifies the way retailers can lease public space based on the current management system.

2.1 Venice is a Small City

It is worthwhile to start our discussion of public space with a brief description of the layout of Venice. The city has a surface area of approximately 6.3 square kilometers, which puts it at roughly the same size as a major airport. Venice consists of 126 islands and a total of 437 bridges, and is largely a pedestrian city, with the two major modes of transportation: walking or boating.[4] With regards to the city walkways, Venice has approximately 2,650 narrow, winding streets, totaling up to about 178 km of paths. Of these walkways, there are six major arteries, which connect the four major tourist attractions in the city.[5] Since Venice is a particularly small city that has little to no room for expansion, every inch of space matters. It is an important aspect of this project to have a comprehensive understanding of the layout of the city and of the use of the small amount of public space that is available.

2.2 The Changing Demographics of Venice

While Venice was once a bustling and wealthy trading center, the situation has changed over the past hundreds of years. Tourists are replacing a rapidly declining resident population, which is changing the dynamic of the city. Between 1976 and 2006, the resident population dropped by half, plummeting to 62,027.[6] According to the VPC dashboard on December 8, 2015, the current population of Venice is 55,701. Venice is, however, one of the most visited tourist destinations in the world. Nearly 80,000 people a day will visit the city during the peak months,

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[2] ("History of Venice,")
[3] ("History of Venice,")
[4] (Shea, Elizabeth et al., 2014)
[5] (Shea, Elizabeth et al., 2014)
[6] (Nadeau, 2009)

dwarfing the local population.[7] Venice is beginning to cater more towards its revenue-generating tourists, making the city less hospitable towards the locals.

2.2.1 The Rise of Tourism and its Social and Economic Impacts

The tourism sector is a major part of the Venetian economy. Italy is the 5th most visited country in the world, and Venice is the second most visited city in Italy.[8] Over 20 million tourists visited Venice in 2009, or roughly 55,000 a day (Figure 1). In 2014, that number jumped to 27 million tourists, only making the situation worse.[9] In a city of 55,701, it's easy for a local to feel lost in a sea of tourists.[10] In the peak months, namely July through September, tourism can reach critical levels. Almost 90,000 tourists per day visited Venice in September 2013, nearly one and a half times the size of the total population.
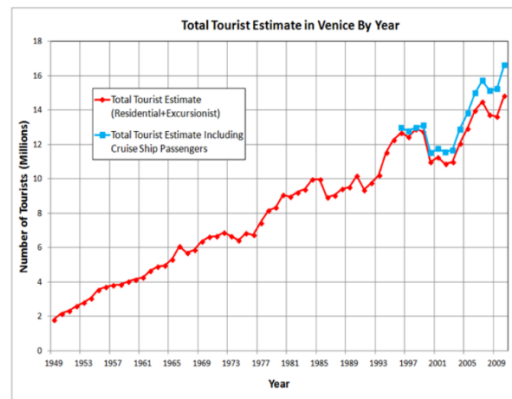
Figure 1. Tourists in Venice from 1949-2009

The number of tourists also vastly exceeds what Venice can handle in terms of traffic. The tourism carrying capacity is defined by the World Tourism Organization as the maximum number of people that may visit a tourist destination at the same time, without causing distress to the physical, economic, and socio-cultural environment, while still maintaining an acceptable level of visitor satisfaction.[11] Using these criteria, Massiani and Santoro suggested a maximum of 25,000 tourists per day for Venice, of which 15,000 are tourists, or people who stay overnight, and 10,000 excursionists, or people who visit for the day.[12] They considered several factors, such as: available accommodation, existing transportation, catering and parking facilities, and the carrying

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[7] (Martin, K. et. Al, 2014)

[8] (Biagi, Brandano, & Lambiri, 2015)

[9] (Venezia, 2014)

[10] (Nadeau, 2009)

[11] (Massiani & Santoro, 2012)

[12] (Massiani & Santoro, 2012)

capacity of famous historical destinations.[13] This is only one suggestion; however, everyone agrees that the current number of tourists visiting the city each day is far too high, and most definitely exceeds the city's carrying capacity.

This defined value has been exceeded in Venice since 1987, and now the number of tourists per day is more than two times the supposed maximum capacity[14]. Figure 2 shows the number of tourists and excursionists who visited Venice per day for each month of 2013, and only in December do they align with Massiani and Santoro's suggestion. These numbers are the main reason for pedestrian traffic in the city. This disparity between the number of tourists and the number of locals is unsustainable, and may well change Venice from a city into a tourist destination.
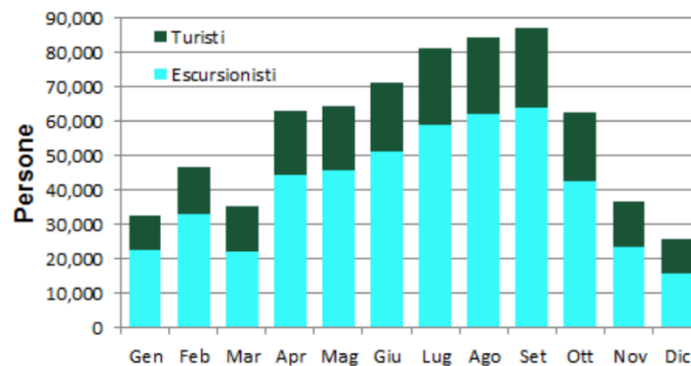
Figure 2. Number of Tourists Visiting Venice per Day for Each Month of 2013

Tourism does, however, make up a significant portion (over 10%) of the Italian GDP: 161 billion Euros annually.[15] The revenue generated from tourism is appealing to heritage cities, like Venice, which need a source of income. Venice brings in over 2 billion Euros a year in tourism tax revenue, making tourism crucial to Venice's existence.[16]

2.2.2 The Decline in the Local Venetian Population

Venetian locals take pride in their city, and with good reason. The city's rich history, many architectural wonders, and cultural advances across the centuries, make it one of the most notable cities in the world. However, since the 1960s, the resident population of Venice has been steadily declining. As of 2006, Venice's population of locals was 60,027, which was just over half of the population merely 30 years ago. In 2009, Venice's population dropped below 60,000, a benchmark that the Venice natives had been dreading.(Figure 3)

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[13] (Massiani & Santoro, 2012)

[14] (Massiani & Santoro, 2012)

[15] (Biagi et al., 2015)

[16] (Martin, K. et al., 2014)
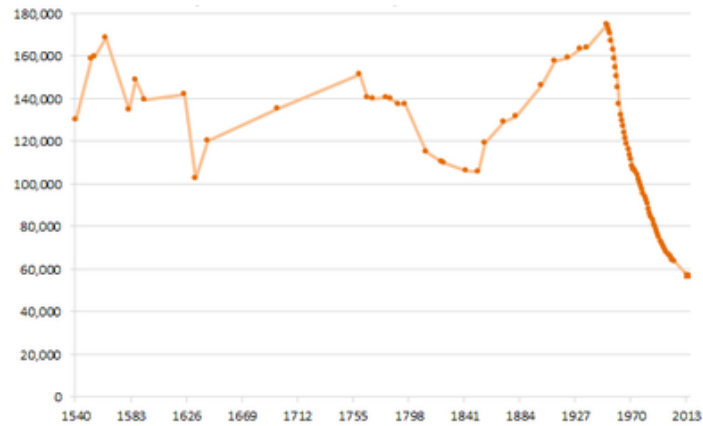
Figure 3. The Population of Venice from 1540 to 2013

There existed an agreement between the members of venessia.com, a pro-Venetian website, that if the population shrank below this amount, a funeral would be staged for the city of Venice to lament the decline of their great city. Staying true to their words, in November of 2009 a ceremony was held with a red coffin to symbolize the death of *La Serenissima* (Figure 4).[17]

Figure 4. The Funeral Procession for *La Serenissima*

In addition, the average age of city residents has been rising, indicating a decline in younger residents who are willing to stay in the city. Over one quarter of the Venetian natives in 2009 were over the age of 64.[18] Some speculate that life in Venice for the locals has been more difficult ever since the steep rise in tourism began after World War 2. Resources in Venice are inherently expensive, since they must be brought to the city by boat. There is limited space as well, an important issue especially when it comes to shops and stalls in the city. These shops are also no longer catering to the residents, since there is more profit to be made by servicing the many tourists that visit the city each day. The space restriction is also driving the price of real

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[17] (Squires, 2009)
[18] (Squires, 2009)

estate up, making it harder for local Venetians to find properties to move into once they have grown up. The arrival of excursionist tourists to Venice, those who visit the city for a few hours but may not spend money that would go back into the local economy, is only making things worse for the locals. These excursionist bring all of the negative side effects of tourism, and very few benefits. The local Venetian is having a harder and harder time getting around the city, let alone acquiring basic goods, and as a result, they have begun fleeing Venice.

2.3 Retail Sector

Since the main focus of this project is the encroachment into public space by Venetian shops and stalls, it is important to have a comprehensive understanding of the city's retail sector. The following sections will introduce the current economic situation in Venice, how retail businesses are classified throughout Europe, and the types of retail that are most popular in Venice.

2.3.1 Economic Climate in Venice: Tourist Stores vs. Local Stores

Even though the economy of Venice has changed over the course of history, the city has always relied heavily on commerce. The trends in declining population and increased tourism have changed the retail sector. Now it has become more lucrative for businesses to cater to the tourists rather than the resident, and this has created an unbalanced dichotomy; stores catering to visitors and stores catering to local needs.

A tourist store is one that tries to satisfy the needs of a visitor in Venice and includes shops that, for example, sell souvenirs, glass, and masks. On the other hand, a resident store is one that tries to satisfy the needs of locals, including grocery stores, stores that sell household supplies, and hair salons. Some stores, like restaurants and bars, service both residents and tourists.

The retail sector of the city has begun to follow Venetian demographics, as the number of resident stores begins to dwindle in contrast with the rise of tourist stores. In fact, according to a Venice Project Center study, tourist stores had increased by 229% from 1976 to 2012.[19] To make matters worse, locally owned and run Venetian stores are also being out-competed by large corporations owned by outsiders who can afford to set lower prices. One major example is supermarkets, which are out-performing small specialized fruit, vegetable, fish and meat stalls by providing a variety of products at low prices, all in one convenient location.

As a result of this changing demand, Venice has become difficult environment for locally owned small businesses, specialized shops, and traditional stores. For instance, in August 2007 Molin Giocattoli, a popular Venetian toy store that had served the local community for decades,

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[19] (Schulman, I., Olm, A., Chen, H., Bruso, B., 2013)

went out of business, and since December 2007 at least ten hardware stores have closed. Yet another example was when

> La Cami-ceria San Marco, a clothing store located near the Piazza San Marco for 60 years, had to move to a smaller, less prime spot because the rent had tripled. The shop, quintessentially Venetian, tailored pajamas for the Duke of Windsor and sport shirts for Ernest Hemingway.[20]

As a National Geographic article points out, "In the Rialto market, souvenir sellers have replaced vendors who sold sausages, bread, or vegetables. Tourists will not notice. They do not visit Venice to buy an eggplant."[21] Figure 5 helps to further illustrate this point by displaying the density of resident, tourist, and mixed stores throughout the city. It is important to study the trends in the city's evolving retail sector since the decline of resident specific stores impacts the local community.

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[20] (Newman, 2009)

[21] (Newman, 2009)

Figure 5. Comparing Tourist, Residential, and Mixed Stores as Analyzed in 2012[22]

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[22] (Schulman, I., Olm, A., Chen, H., Bruso, B., 2013)

2.3.2 Classification of Businesses in the Retail Sector

Clearly, shops can be categorized by who they serve; tourists, residents, or both, but economists also find it helpful to further categorize commercial businesses by the type of services or goods they sell. Throughout the European Union, businesses are categorized based on an industry standard called NACE (Nomenclature of Economic Activities).[23] The NACE standard is based on the United Nations system for categorizing economic activities, which is called the International Standard Industrial Classification system, or ISIC. The ISIC and the NACE are similar at the most general level, however the NACE becomes more detailed at lower levels, specifying the type of goods.[24] These levels of categorization can be seen in Figure 6. NACE was developed in the 1970's and separates businesses based on what service they offer or what product they sell. A four-component code is given to each economic activity; an example of how the code works is shown in Figure 6.

G : Wholesale and Retail Trade

G52 : Retail Trade

G52.4 : Other retail sale in specialized stores

G52.43 Retail Sale of Footwear and Leather Goods

G52.43.1 Retail Sale of Footwear
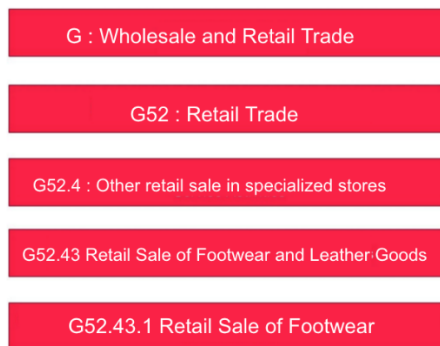
Figure 6. An Example of how the NACE Standards Are Used to Classify Economic Activities in Europe

The VPC has used the NACE standard in previous studies to classify shops and stalls throughout all of Venice. Because NACE codes do not provide a deep enough layer of detail for studying the trends of the Venetian retail sector, however, a more in depth code was needed. For example, the NACE standard in Figure 6 would stop its description at leather goods, but would not differentiate between stores that sell leather gloves, leather handbags, or leather shoes. To make this finer distinction, the VPC added a fifth level, an example of which can be seen in Figure 7.[25] Category G is for wholesale and retail goods, 52 is specifically for retail, 4 is for specialized stores, 3 is for footwear and leather goods, and 1, the extension created by the VPC, specifies that this is for footwear only. Understanding this new classification system is important for a finer analysis of trends in the Venetian retail sector.

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[23] (Rev, 2008)

[24] ("What Is a NACE Code?,")

[25] (Schulman, I., Olm, A., Chen, H., Bruso, B., 2013)

Figure 7. Modified Categorization System for Classifying Shops in Venice[26]

2.3.3 Definition of Shops and Stalls

Goods in Venice are sold in shops and stalls. A shop is a business that sells commercial goods or services, within a building with a fixed address. Shops include grocery stores, leather bag stores, department stores, glass stores, restaurants and bars, and other such retail activities (Figure 8). A stall is a business that sells commercial goods or services, but is not fixed to a permanent structure. Stalls include kiosks that move about the city, the various open-air food and artist markets, and newspaper stands. These are businesses that can, in theory, be moved elsewhere, even though they apply for and are assigned a location (Figure 9).

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[26] (Schulman, I., Olm, A., Chen, H., Bruso, B., 2013)

Figure 8. An Example of a Shop

Figure 9. An Example of a Stall

2.4 How Shops and Stalls Occupy Public Space

Public spaces symbolize the culture and the history of the society in which they exist. There are different activities that take place in public spaces, where community members interact. In Venice, public space is very limited, and unique restrictions are placed on its use by private businesses. The tight-packed buildings and the network of canals restrict what space is available, and this space is further limited by structures placed there by the owners of the shops and stalls.

Public space is used by the retail sector in four ways (Figure 10).[27]

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[27] (Plant, 2002)

1. Extensions of Store Space

2. *Posteggi Isolati*

3. Market Areas/ Exhibition

4. Street Artists

Plateatici

Posteggi Isolati

Market

Artist

Figure 10. Four Main Uses of Public Space

The most common use of public space is the extension of store's space, outside of the builiding in which it is housed. This would include a restaurant or bar's use of outdoor seating. The majority of these businesses take advantage of the additional revenue that outdoor seating areas can provide. Other forms of extensions by stores include signs, scaffolding and hanging goods outside stores, examples of which can be seen in Figure 11.

Figure 11. Examples of Other Uses of *Plateatici*

Posteggi Isolati translates to English literally as isolated parking spots; they are essentially parking spots for the kiosks and stalls throughout the city. There are two types of *posteggi*, ones that have fixed construction and ones that have movable construction, but the parking spots are

always in the same location. The fixed construction *posteggi* include kiosks and *edicole*, or newspaper stands. There are 10 kiosks and 30 *edicole* in Venice.[28] The movable construction *posteggi* include the rolling stalls, pictured in Figure 12, that are everywhere in Venice. They are set up early in the morning, and are removed late at night. These stalls normally sell touristy items, like souvenirs, postcards, flowers, and food. In total, there are 300 *posteggi ambulanti* throughout the city.[29]

Figure 12. Example of *Posteggi Isolati*

Another use of public space in Venice are the various markets, also known as bazars. There are two types; daily markets and periodic markets. Some of the daily markets in Venice are: The Rialto Market, the San Marco Market, and the Burano Market. Usually they sell food products, such as; fruits, vegetables, cheese, meat and fish products. The periodic markets are open once a week, and sell either food products or non-food products such as flowers, plants, leather goods, and clothing. These non-food markets are typically classified as artist markets, an example of which can be seen in Figure 13.

Figure 13. An Artist Market in Santa Maria Formosa

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[28] (Sensini, 2015)
[29] (Sensini, 2015)

Finally, there are the individual street artists, such as photographers and painters. They take advantage of these public areas, attempting to sell their wares to the thousands of tourists who pass through the city. They have a legal permit from the city, and their location is stable. These artists are supposed to be making their art in the location granted by their permit, in order to verify its authenticity as Venetian. There are 40 street artists in total registered with the city.[30]

2.5 Regulations and Methods for Leasing

The City's regulations that were created to facilitate the retail sector's use of public space are called *pianini*, or little plans. *Pianini* aim to reorganize the public spaces, and identify the maximum area allowable for commercial use, trying to satisfy both the businesses and the community. These plans dictate which area is leasable by the retail sector within a square, and dictate which areas must be left free to the public. Not all public space in Venice is defined by *pianini* though; usually, the most trafficked squares have specific *pianini*, while the rest follow more general overarching regulations. Currently, there are 22 *pianini* approved by the *Superentendencia*, the governing body in charge of public space. Another 22 *pianini* were created recently, and are awaiting approval by the *Superentendencia*. An example of a *pianini* can be seen in Figure 14.
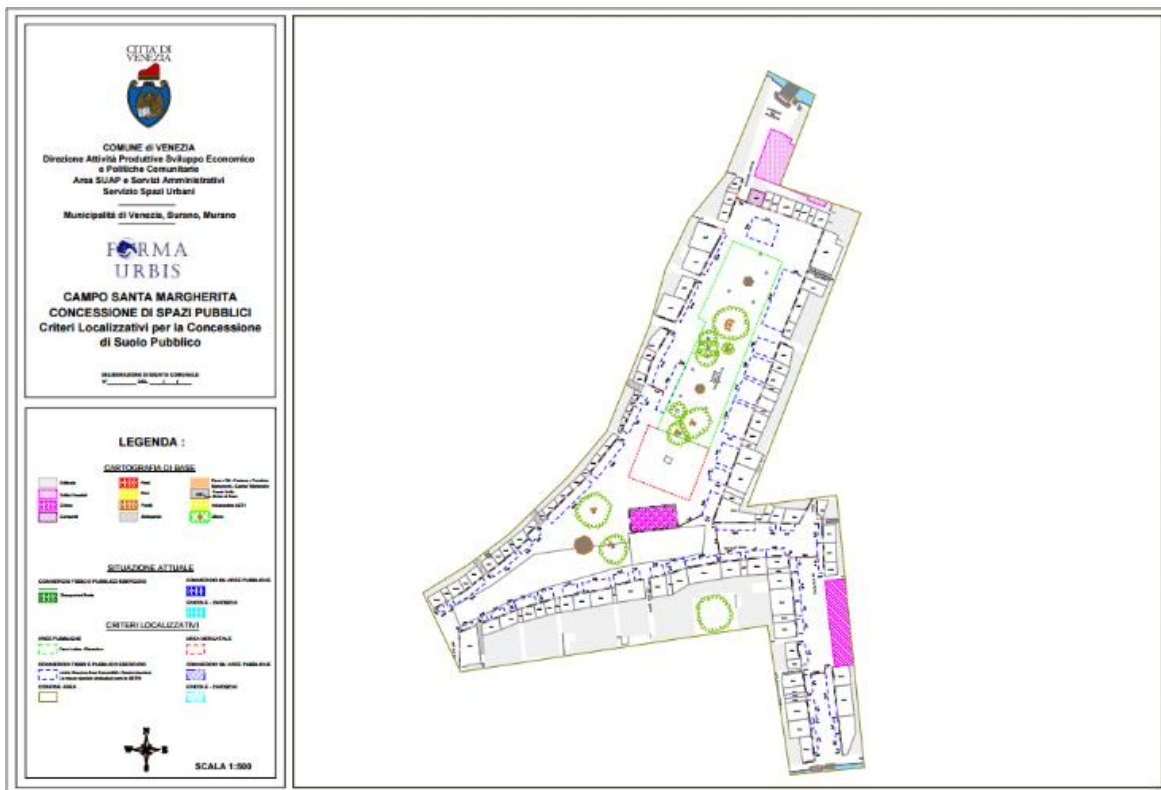

Figure 14. The *Pianini* for Santa Margherita

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[30] (Sensini, 2015)

Recently, the overarching regulations for public space in Venice have drastically changed the ways public space is used. Previously, a 4-meter-wide walk way had to be left open in each street and square to accommodate foot traffic. In 2014, the law was changed to say that no more than of 1/3rd of the public space in each square can be leased, which can leave walkways even larger than the previous 4-meter width specifications. For the general regulations, there are restrictions based on the traffic level for an area. A street traffic map, indicates which streets are deemed high, medium, and low traffic, but these levels are determined subjectively.[31] The regulation specifies that high traffic streets should allow a 4-meter distance for pedestrian walkways, medium traffic streets should allow a 3.2-meter distance, and low traffic street cannot lease more than 1/3rd of the street, whatever distance that may be.

Every business owner can request to lease public space for their business; shops can apply for *plateatici*, and vendors can apply for kiosks and market space. Priority is given to the shop owners who have had a *plateatici* before, and a point system helps to determine other factors that influence who gets what. Each approved business has to pay a yearly fee for the *plateatici*, which is determined based on the age of the business, if it is temporary or permanent, and the demand in their location. The cost also depends on other factors: the type of business, the artistic and environmental value of the area, hours of operation, the impact on the environment due to occupation, and the position of *plateatici* in regards to the store (whether it's in front of the store or adjacent). The yearly fee rate varies from 17.27 to 72.60 euros per meter squared for the year: these prices are extremely low considering the revenue *plateatici* bring in.[32] These yearly fees are also determined in what appears to be a subjective manner; certain multipliers are used in determining cost, which don't appear to have any guidelines. An example of a cost calculator can be seen in Appendix C.

Unfortunately, these *pianini* are difficult to enforce and are often violated by the businesses. Police checks often happen only when someone complains. If the police find that a business has overstepped the area of their *plateatici*, an encroachment fine will be applied. After two fines, the business will have their *plateatici* suspended for three days. For every fine after that, the business will automatically get a 3-day suspension of their *plateatici*. Figure 15 shows an article about the closure of a traditional restaurant in the Cannaregio *sestieri* for three days after they were caught twice by the police overstepping their *plateatici* limits.

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[31] (Sensini, 2015)
[32] (Plant, 2002)

Figure 15. The Suspension of *Plateatici* for 3 Days

The intervention occurred in response to complaints from the neighbors, who were disturbed by the noise. Encroachment fines like these, however, may not be a deterrent, and are often considered part of doing business; usually these fines are not very high, and the businesses will pay them and continue to ignore law.

2.6 Negative Consequences of *Plateatici* expansion

The retail sector's use of public space is making Venice's streets more crowded each day, as seen in Figure 16, causing pedestrian traffic and noise pollution, which negatively affects the quality of life of the locals.

Figure 16. Ruga dei Oresi on a Normal day

Congestion is made worse due to tourist pedestrians solely using the main arteries of the city. These main arteries and the main tourist attractions have noise levels higher than the resident neighborhoods surrounding them. For example, St. Mark's square, where the noise level can

31

reach as much as 65 decibels, is significantly louder than the neighborhood around it.[33] Figure 17 shows a map of Venice with a reference guide for the decibel scale.
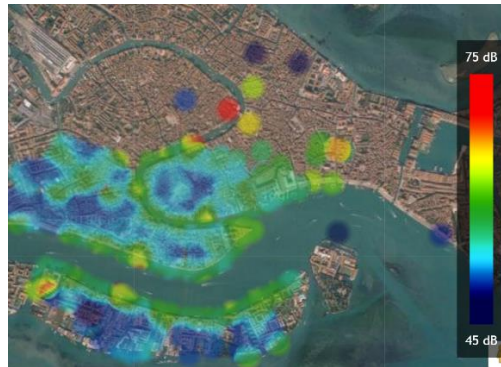
Figure 17. Output from the Venice Noise App[34]

The local population and tourists are being affected by the problems associated with *plateatici*. *Plateatici* are one of the main topics in the media now, taking over newspaper headlines not only in Venice, but also all over Italy. In September of 2015 alone, there were over ten articles associated with *plateatici* and how it is affecting society.

Ruga dei Oresi, known as the Oresi Street, is one of the busiest and oldest streets in Venice. There is not a day of the week or time of the day that pedestrian traffic and noise pollution is not a disturbance to the local people, and to those visiting Venice, it's not surprising that this is becoming one of the central topics of the media in the city. "Nuova Venezia", a Venetian newspaper, covered recent protests and demonstrations of the businesses (Figure 18, Left).[35] Many of the businesses and artisans there have recently requested to renew the area of their *plateatici* occupies, but their requests were denied by the City Hall, and they were told that a fine would be applied if they didn't respect the rules.[36] These articles represent the current situation in Venice.

The article on the right in Figure 18 discusses how the *plateatici* contributes to noise pollution throughout the city. In many cases, outdoor cafes and bars gather a large number of people in a single location late at night, which can be disruptive to the local community. The article specifically mentions Santa Margarita square, which is well known for the noise pollution created from its *plateatici*.[37] Since Venice is traditionally a quiet city, the rising sound levels are upsetting to the local people and this article highlights the views of many discontented Venetian citizens with the *plateatici.*

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[33] (Ripley, J. Wesley, Pomerleau, C. Neil, Puishys, E. Robert, Calamari, S. Elliott, Bianchi, Frederick W, 2012)

[34] (Ripley, J. Wesley et. al, 2012)

[35] (Bortolussi, 2014)

[36] (Canzoneri, 2015)

[37] ("La protesta dei commercianti a Venezia contro il riordino dei plateatici," 2014)

Figure 18. Newspaper Articles in La Nuova Venexia (left) and IL Gazzetino (right)

2.6.1 Looking to Alleviate Problems Caused by the Retail Sector's Use of Public Space

A 2006 case study of pedestrian traffic in the popular square of Santa Margherita summarized three needs of the local residents:[38]

1- To maintain a sufficient pedestrian passage.
2- To maintain enough room for public use, i.e. room for children to play and people to congregate.
3- To reduce the noise produced around the living area.
4- The researchers proposed changes the city might make to the current *plateatici* policy to meet these needs, using the six tools of Government, which are shown in Figure 19.

Figure 19. The Six Tools of Government

They made the corresponding points;

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[38] (Carrera et al., 2006)

1. The city owns the public space in Venice, so it is free to create laws and regulations dictating the use of public space.
2. The city has enacted regulations limiting the size of *plateatici*, however, these regulations need to be enforced regularly.
3. The city can use incentives and disincentives, like increased fines, to discourage shop owners from operating too late and creating noise problems.
4. The city can inform shop owners of exactly what rights they do and do not have, in order to prevent confusion with regulations.
5. The city can trade rights with the shop owners, i.e. a store can have extra space during the day if it has less space at night.
6. The city can compensate the locals to make dealing with these problems better. For example, the city could buy residents soundproof windows, or air conditioning units.

Finding specific ways to enact these suggestions was one important goal for the current project.

2.7 Impact of Problems Caused by Shops and Stalls' Use of Public Space

As this chapter has shown, the local population of Venice is dwindling, and the number of resident stores may be declining, which allows tourist stores to occupy the space left behind. Some of these stores are extending their business into public spaces, and this can affect the quality of life in Venice. Frequent evaluations of the city's shops are needed—how many there are, what types of goods they sell, where they are located, and whether they are using public space. This project builds on the work of other studies cited in the chapter and captures the changing face of the retail sector, evaluating the way these businesses currently use public space in Venice. This allowed us to propose a new blueprint for handling the *plateatici* that are too loud or taking up more than their allotted space. These data and recommendations will help alleviate congestion on the streets, and to contribute towards improving the quality of life for local Venetians that have to cope with *plateatici* on a daily basis.

3. Methodology

The aim of this project is to capture the evolution of Venice's retail sector and ameliorate the issues caused by *plateatici* through the development of a management tool for the lease and oversite of public space.

The objectives of the project are:
1. To develop tools for analyzing the evolution of the retail sector
2. To create a tool for better management and enforcement of the *plateatici*

Research and data collection focused on shops within Cannaregio, the northern neighborhood which features Venice's train station, and can be seen in Figure 20.

Figure 20. Map of Venice and its six *Sestieri*

Data was collected and analyzed over seven weeks, from mid-October to mid-December 2015. The sections to follow outline the team's method for recording shops, mapping the use of public space by retailers, and creating a blueprint for management of that space.

3.1 Creating Tools for Analyzing the Evolution of the Retail Sector

In order to analyze the changing face of the Venetian retail sector, the team developed two tools to facilitate data collection and visualization. The first thing the team wanted to do was to develop a mobile application that could be used to optimize the process of collecting data throughout the city. To do this the team decided on a main set of data points we wanted this application to focus on, as outlined in Figure 21. Once that was determined, the team chose to create the application using AngularJS, a JavaScript framework, and Firebase, a cloud-based data storage provider.
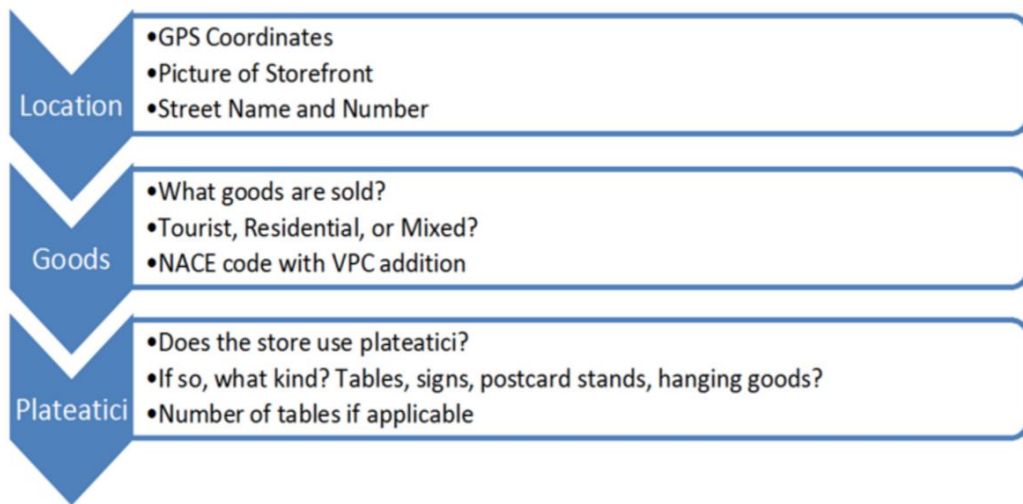
Figure 21. Data Collected on Shops

The second tool the team wanted to create was another application that could be used to instantaneously display and help analyze the data collected from the first tool as well as to display data provided by the Chamber of Commerce. This tool would also be able to update existing data from 2012 while also allowing for the team to report on store closures.

This year was the very first time that the VPC was given access to the historical data on the Venetian retail sector from the Chamber of Commerce. These records contain over 30,000 entries and go back as early as 1924. However, since businesses were not strictly required to register with the Chamber of Commerce prior to 1996, the entries before this year are not as accurate or complete as those after. Moreover, this dataset is different than the VPC's datasets. While the Chamber of Commerce keeps a record of shops stemming from the registration documents each owner must file with the city, these records do not incorporate the VPC's advanced NACE code nor do they include an image of the store front or how the businesses use public space outside their business; an area that this project addresses. However, the data from the Chamber of Commerce does include a historical record set which does include information on the residency of ownership which is information the VPC has not had before.

To create the second application, the team decided to use Leaflet with Mapbox to create a map, Bootstrap for improving the styling, and Firebase to store the data. The general idea would be that this application would be able to display information visually on a map and would consist of two main components. The first part would be a section for displaying data that the team collected out in the field, and the second would be a section for displaying data that was provided by the Chamber of Commerce. The team created a mock-up to figure out what this second application should look like (Figure 22). We also brainstormed two main features we wanted to incorporate into this new tool: the ability to color islands by different categories (such as population total, population density, etc.) and the ability to filter the data from both the data collected by the team and the data provided by the Chamber of Commerce.
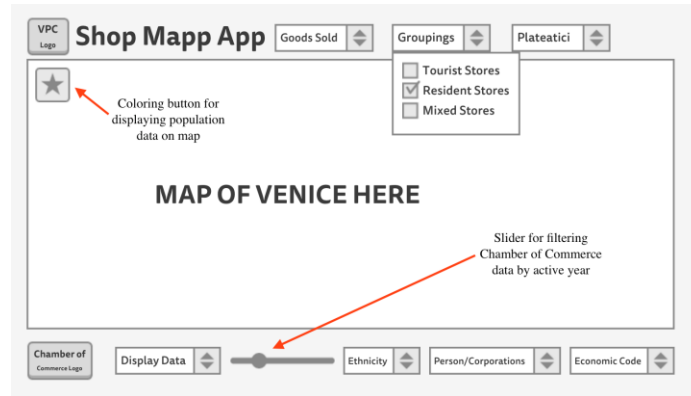
Figure 22. Layout of Shopp Mapp App

Once these tools were made, the team would be able to use the first application to collect data which would be field tested in the sestieri of Cannaregio. This neighborhood was specifically chosen to test our mobile app due to its manageable size for a seven-week study, and its diversity in stores. To collect the data, the team would go around street by street with the first application marking down a number of important fields such as whether the store had plateatici, what goods/services it offered, and whether the store could be categorized as tourist-oriented, resident-oriented or mixed. To categorize the stores by tourist-specific, resident-specific, or mixed the team observed for a few minutes the type of customers who visited each shop. If a store seemed to be visited by a large number of tourists, the team categorized the store as tourist-oriented. On the other hand, if the team observed that a store seemed to be visited by mostly residents, the store was categorized as resident-specific.

Finally, the second application could then be used to visualize the data collected by the mobile application allowing the team to perform an analysis based on the locations of different shop types. Additionally, the team also performed an analysis on the data provided by the Chamber of Commerce, and the second application would play a big part in searching and displaying trends from these records.

3.2 Creating a Management Tool for the Organization of Leased Public Space

As mentioned throughout this paper, the *plateatici,* and other retail space use, like stalls and markets, have contributed to a number of problems throughout Venice. By encroaching on public walkways, they limit the flow of pedestrian traffic and add to the noise pollution in the city. Although regulations do exist, the criteria for establishing limits and the ability to update them are problematic. Enforcement of these regulations is also difficult, as it requires police visiting each store front to measure the *plateatici* (Figure 23).

Figure 23. Police Enforcing *Plateatici*

Our team worked on understanding *plateatici* better by interviewing a member of the Comune di Venezia, Claudio Sensini, and subsequently, developing a tool to better manage the lease of public space in Venice in a way which would satisfy not only the business owners, but also the local community.

To create our tool, we first had to identify gaps and problems in the current regulations. One way we did this is to identify whether and how the city was using the six tools of government: Ownership and Operation, Regulation, Incentive and Disincentive, Education and Information, Rights, and Mitigation and Compensation—and to develop ideas in each of these areas. In order to get a better sense of the actions the city is taking using these six tools, the team interviewed Claudio Sensini, the head of the Urban Spaces division, who helped answer the questions the team had, outlined in Appendix A. The team saw how these tools are being used, and what can be improved, to construct our blueprint to ameliorate these problems.

Because thousands of tourists visit each day, pedestrian traffic and noise pollution have become everyday problems for the residents in Venice. Thus, the team investigated a system for verifying complaints and compliance in regards to leased public space. Currently, for a resident to make a complaint about noise, they must call the police, and hope that enough complaints have been lodged in order to justify the policies intervention. The same goes for shops; a resident or business owner must make enough complaints to the police in order to have action taken. However, Venice has an online city-wide complaint system, called IRIS, that could be used to handle these complaints in a more organized and transparent manner. The team also looked at how the city evaluates noise levels and the use of public space, evaluations that could be sped up. Noise levels are checked by the week-long installation of a microphone at the place of business, to record the decibel levels over the course of business, and public space is simply hand measured by policemen, either randomly or after receiving a number of complaints. The team designed a new hardware unit that could be used to replace both of these methods, along with providing the city with other technical uses.

4. Results and Analysis

As a result of the team's work, two applications were produced to better assist in inventorying the retail sector and in putting the data into a visual, online system. These tools will be adaptable for future data collection. The team analyzed the data in a variety of ways, looking for trends in how and why the retail sector has changed in recent history. The team took particular interest in the plateatici of the city. A new system for regulation was suggested that would help to abate the problems associated with these plateatici.

4.1 Tools for Analyzing the Evolution of the Retail Sector

The team created two tools to analyze the evolution of the retail sector. The first is a mobile application, which can be accessed online from a user's device in order to assist data collection of store location, name, type, and category. The second part is a desktop map application, which enables a visual analysis of the data we collected that is instantly updated from the mobile application. The map app also incorporated the data we received from the Chamber of Commerce. Using these tools, the team searched for trends in the data available.

4.1.1 Developing a Mobile App for Shop Data Collection

In order to track the changing face of the retail sector in Venice, now and for future years to come, the team developed a mobile application that assists with the data collection process. Conventionally, compiling data on the shops of Venice would involve two separate steps: the data recording process, and the uploading process. A team would need to walk to each shop and record the data of interest on paper or their phone, and then return in order to add the collected data to a database for analysis. Aiming to simplify this process, the team combined these two steps into one to allow for more efficient data collection. The application the team developed allowed any user to input store data through a smartphone and upload a photo that goes directly into a database which would supply content for our visualization app. Our final mobile app, Negozi, offered multiple features and contains several fields that we were able to use out in the field for recording data. (Figure 24) (Code Available in Appendix B)
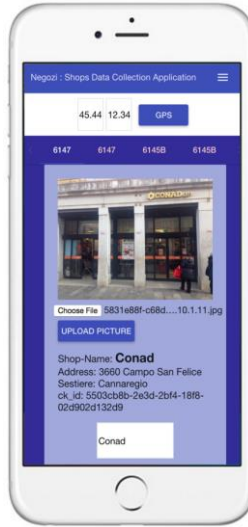
Figure 24. Negozi Displayed on Phone

Upon logging into Negozi, the user is presented with a GPS button. When pressed, the app will use GPS coordinates, taken from the mobile device, to reference past WPI shops data (Figure 25). A list of tabs for each store within a 70-meter radius appears. The tabs are labeled by the address of the store. Users can swipe between the tabs or click on the tab headers to find the store and either update the data, or mark the store as closed.

Figure 25. Breakdown of Negozi

In order to submit data using Negozi, it is required that an image of the store (taken with the smartphone camera) be uploaded along with the other data. This served as a way of validating our data, proving that the team had been to the location and prov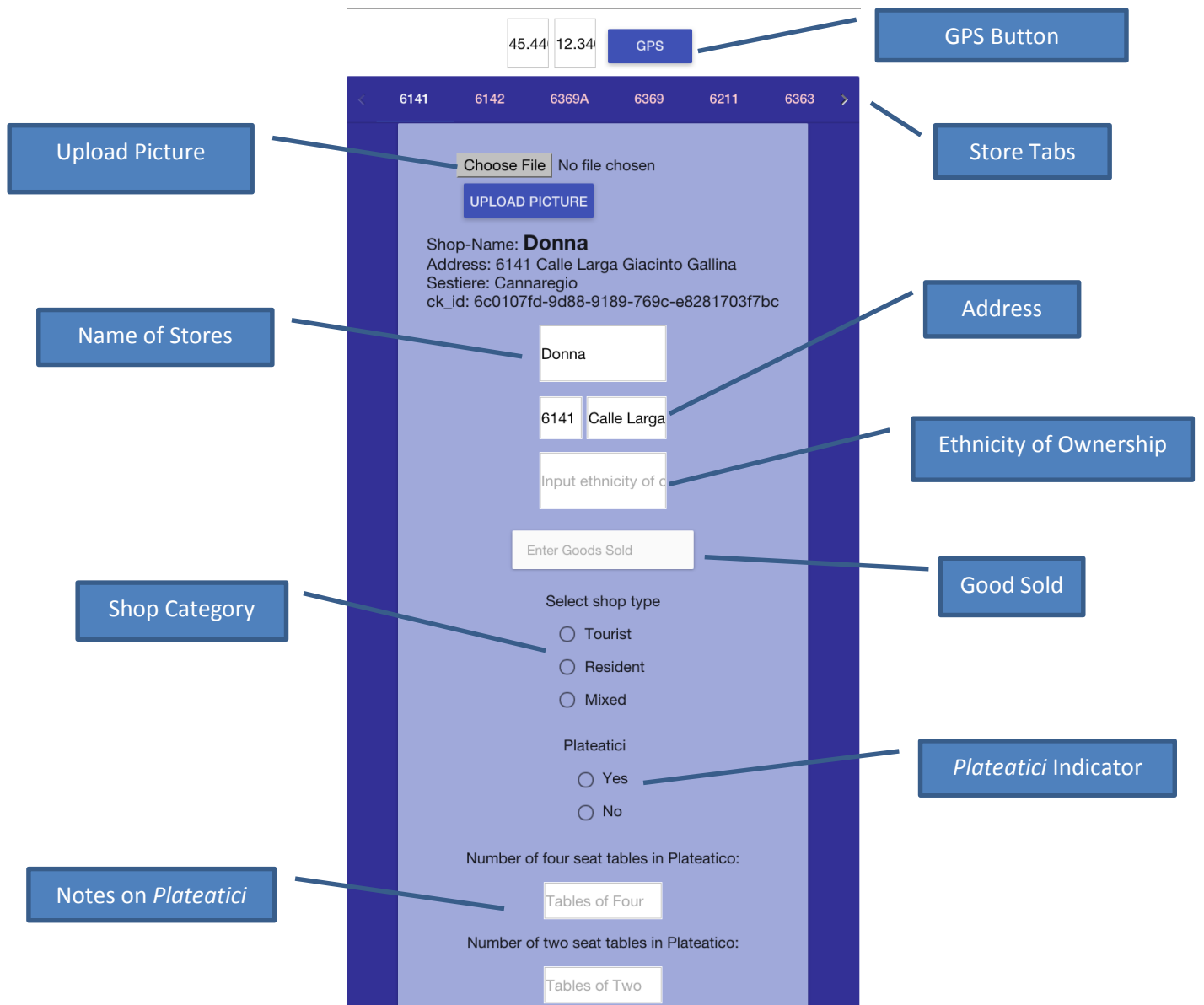ided some visual proof of our claims about the store. A preview of the selected picture is displayed, and the user can choose to upload that picture if it is satisfactory. Once the picture has been successfully uploaded, a message reading "OK!" will appear to indicate success.

Following the picture upload, there are fields that describe the name and address of the store. These are autocompleted using data from the 2012 study, *The Merchants of Venice*. There is the option, however, to change the data within these fields should the shop move or the name change. Additionally, there is a field for ethnicity of ownership, though this field was rarely used due to an unavailability of this information.

One of the most important fields is the goods sold. Using the NACE plus code categorizations of stores, there are many different options to choose from (bar, souvenir, florist, etc.). An autocomplete box helps users type the categorization of shop. This information was very important for our analysis of the data.

In another field, users can select whether the store caters primarily to tourists, residents, or mixed clientele. This was implemented because the team wanted to be able to look at each store individually and try to discern who the target audience was. For instance, there are restaurants catering exclusively to tourists (displaying pictures of the food and having translated menus) where local Venetians wouldn't want to be caught dead there. The team looked for indicators, like menus with pictures of food, to determine this (Figure 26). There are some restaurants that local Venetians frequent, but which might also cater to a tourist looking for a more authentic Venetian meal.

Figure 26. A Sign of a Tourist Restaurant

In the interest of looking at how shops affect the appearance of the city, the application has a field for whether or not a store owns plateatici. Underneath the yes or no option, Negozi includes fields for both tables with four chairs and tables with two chairs. We chose to include these because tables take up the vast majority of space occupied by plateatici, which can also include smaller things like postcard stands or signage. By recording the number of tables, we can use the data to get an approximation of how large the plateatici is, reaffirmed by the picture uploaded with the entry.

Finally, Negozi offers a field for general notes deemed important. Frequently, this was used to describe plateatici present that weren't associated with restaurants, bars, or tables. Once this and all other information have been completed, users can select the submit button in order to upload their newly recorded information. Once the timestamp appears and the data has been uploaded, it is instantly usable from the database.

4.1.2 Developing a Map App for Visualizing the Retail Sector Data

The team developed a web application called the "Shopp Mapp App" (Figure 27) for visualizing and analyzing the evolution of the Venetian retail sector. This application was composed of two main components: the first was for displaying data that the team collected in Cannaregio this year and the second was for displaying data the team received from the Chamber of Commerce. To create the "Shopp Mapp App" a number of software development frameworks and libraries were used such as: Leaflet, Mapbox, and Bootstrap. For more information regarding the application's creation see the code in Appendix B.
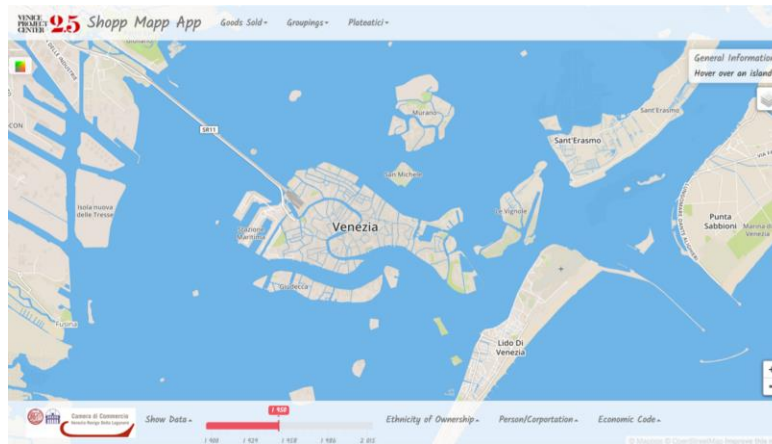

Figure 27. Shopp Mapp App

The first portion of the "Shopp Mapp App" focused on displaying store data the team collected in Cannaregio with the Negozi App (Figure 28). Since Negozi instantaneously uploads shop data onto firebase, the Map App was able to obtain these records by pulling the information from the database and display them in their exact locations on a map. This part of the "Shopp Mapp App" displays stores by using icons, and when these icons are clicked more information regarding the store is displayed as seen in Figure 29. While the application can display all of the records collected in the *sestieri*, the team added three main fields for filtering shop records to improve the user interface.
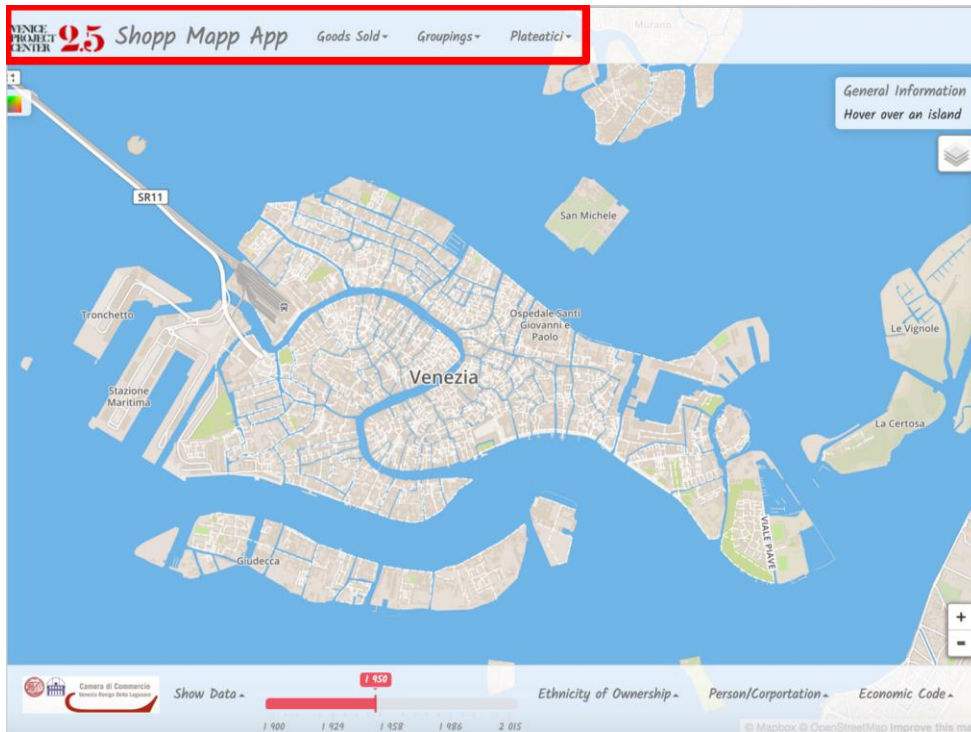
Figure 28. Top Right, Fields Filled in by VPC

Figure 29. An Example of Store Information Presented on the Mapp App

The first filter a user might use is "Goods Sold" (Figure 30). The user can select a given good or service offered by a shop in Venice, and the Map App will show popups of all such stores on the map. For example, if the user selects the Restaurant option, the map will only display restaurants. Likewise, if the user selects both Restaurants and Souvenir Stores, the map will display results for Restaurants and Souvenir Stores.
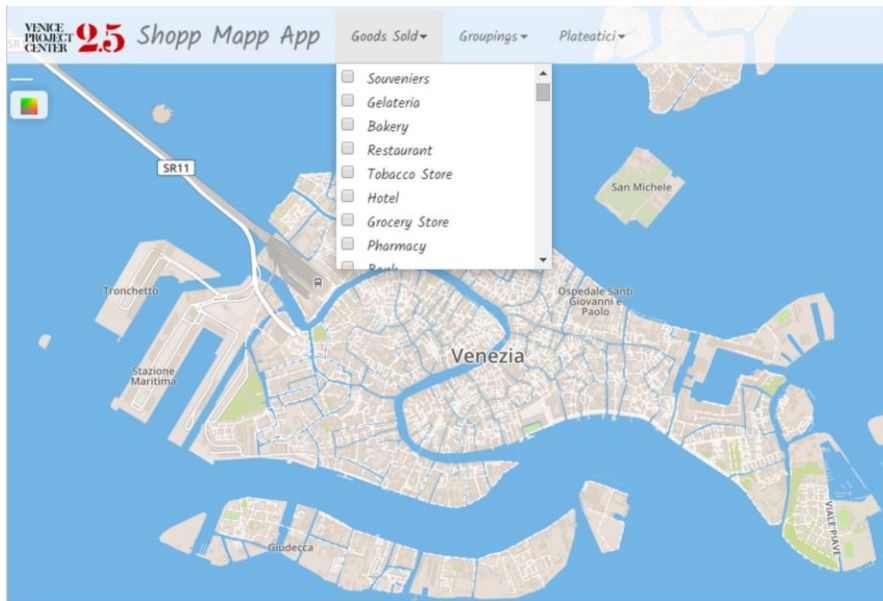
Figure 30. The Goods Sold Tab

The team used over 80 different types of icons to display stores by "Goods Sold", and these icons can be seen in Figure 31.

Figure 31. Examples of Icons for Mapp App

The next filter was "Groupings" which displays Tourist, Resident, or Mixed shops, as had been labeled by the team (Figure 32, Left). The user can also display stores that have *plateatici*, whether it be outdoor seating or postcard stands and such (Figure 32, Right).
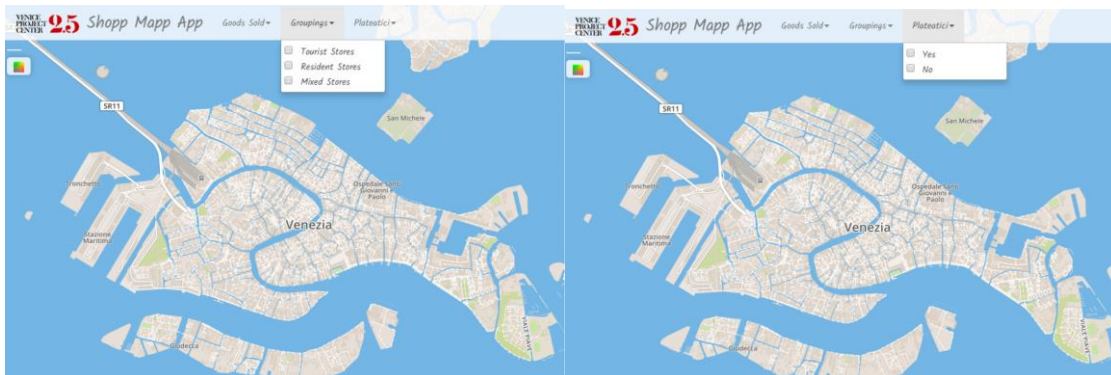
Figure 32. Groupings and *Plateatici* in the Shopp Mapp App

The second part of the "Shopp Mapp App" displays the data the team received from the Chamber of Commerce (Figure 33). All of these records were put onto Firebase and the application pulls information from it to be displayed on the map. Unlike the previous portion of the "Shopp Mapp App", this part does not use icons to display the stores. Instead red circles are used, and clicking on these circles displays more information on the shops as seen in Figure 34.

Figure 33. Chamber of Commerce Data Selection

Figure 34. Example of Data from Chamber of Commerce

The user can select whether to display or hide the records from the Chamber of Commerce. If the user selects "show data", only the shops active during the year chosen on the

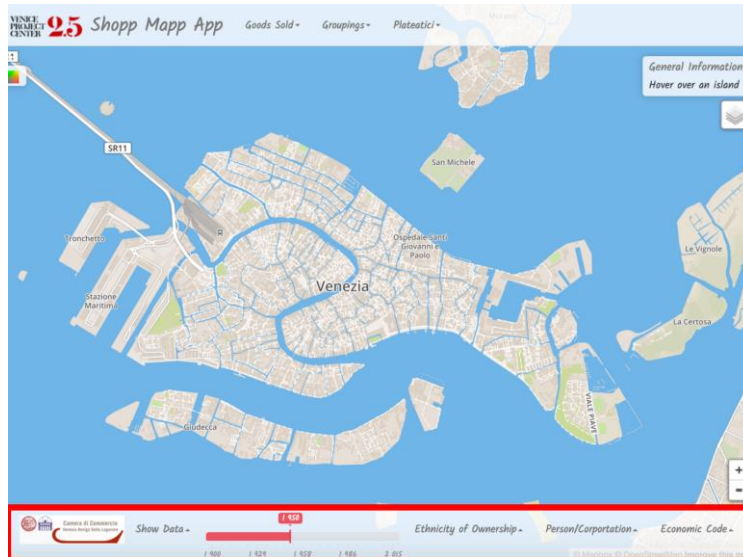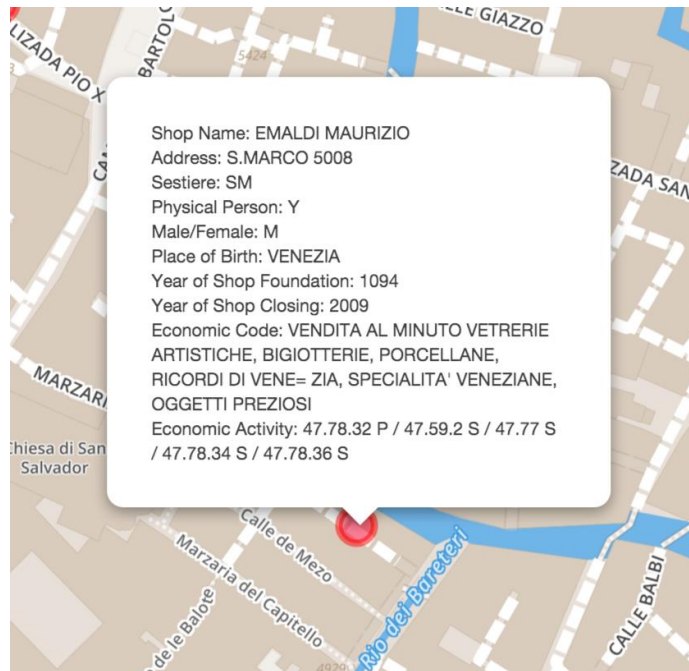slider are displayed. This was done because the data set is historical and contains records that go as far back as 1924 (Figure 35).
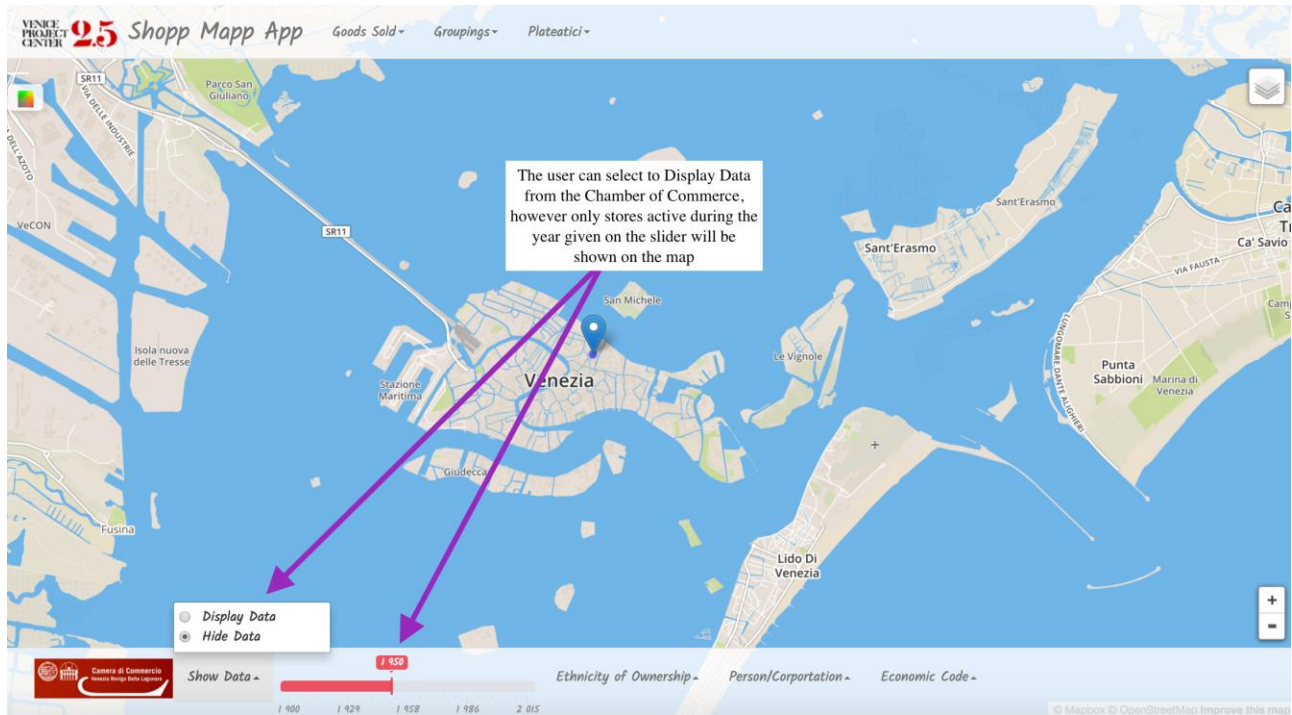
Figure 35. History Slider on the Mapp App

Similar to filtering data in the first part of the "Shopp Mapp App", the user can also sift through the records in the Chamber of Commerce, but the field available would display different kinds of data that we collected, for example: Ethnicity of Ownership, Person/Corporation, and Economic Code.

For example, if the user filters for Ethnicity of Ownership and selects Venetians, the map will only display stores whose owners were born in China (Figure 36, Left); however, selecting China and another country, like Bangladesh, will display stores whose owners were born in either place (Figure 36, Right).
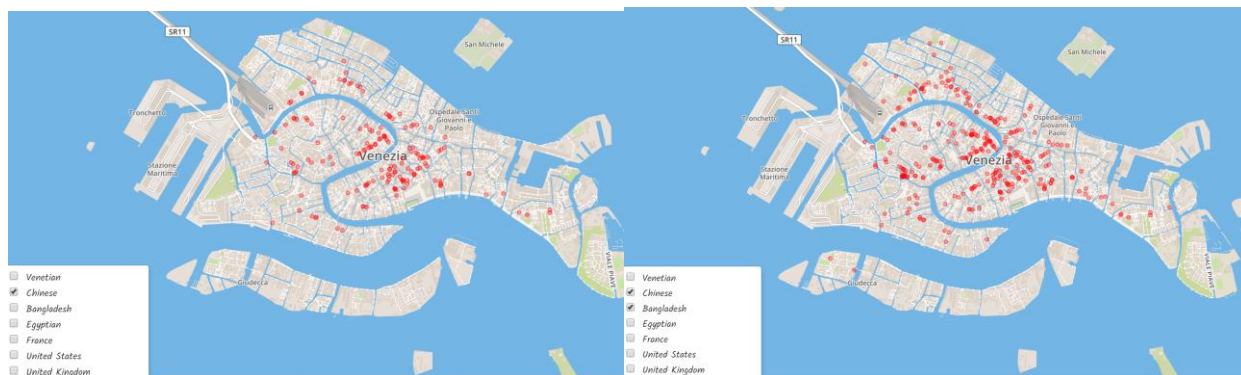
Figure 36. Ethnicity Filters, Chinese (Left), Chinese and Bangladeshi (Right)

"Shopp Mapp App" also allows the user to colorize according to variables such as the population, population density, and average age. When used in conjunction with the shop data,

these variables can be incredibly useful for detailed analysis. Figure 37 shows an example, where population density and resident stores are overlaid on the map, showing that resident stores do indeed line up with the islands with the higher populations.
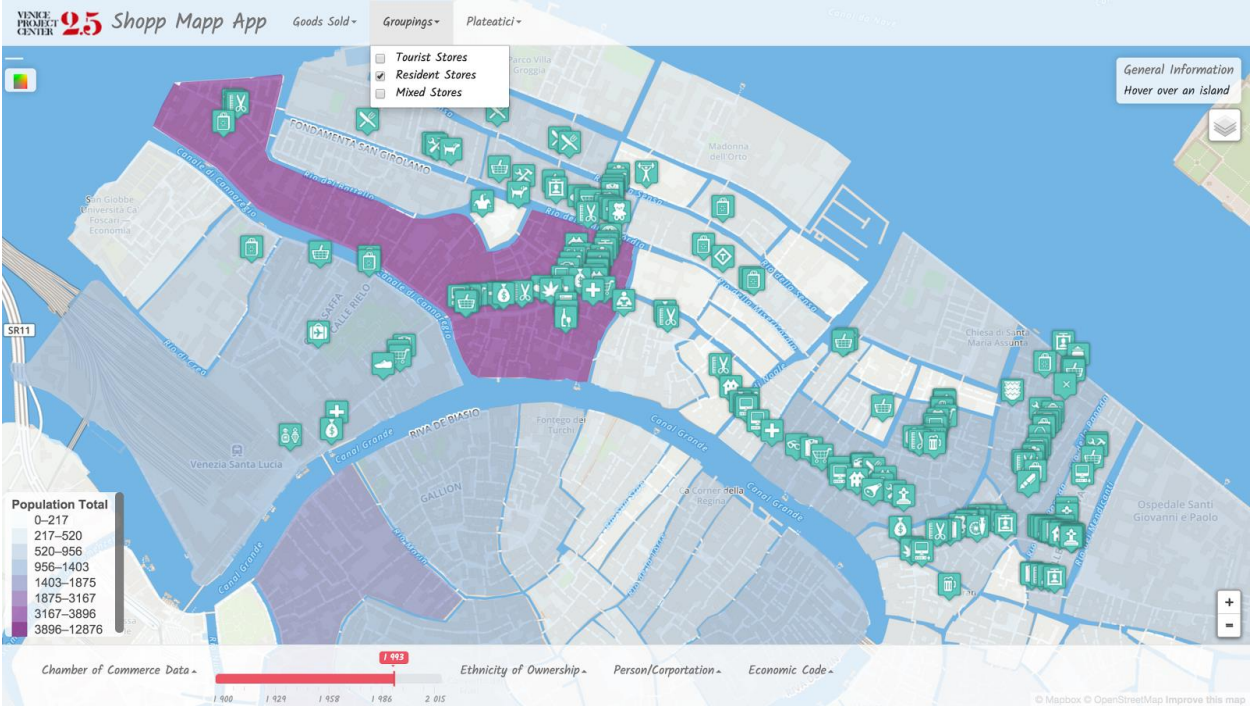
Figure 37. Population Per Island, With Resident Stores

4.1.3 Results from Field Testing Negozi in Cannaregio

The team field-tested Negozi in Cannaregio, documenting stores on every street for a grand total of 1102 recorded stores in the *sestieri*. To determine how many stores the team collected data on, we developed a script in ruby to count all of the entries from Firebase with the '2015' tag. The 1102 recorded stores can be further broken down into active and closed stores. As can be seen from Figure 38, the team collected data on 809 active stores and 293 closed stores in Cannaregio.
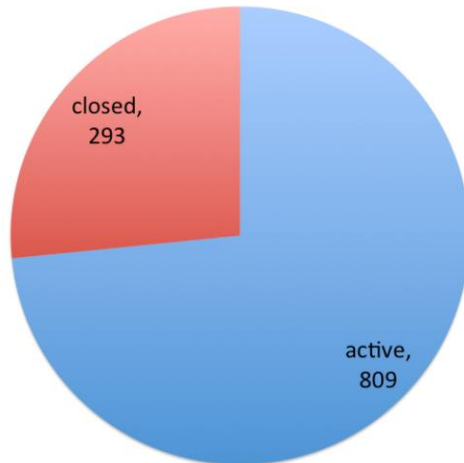
We then compared these values to those collected in 2012, the year the VPC last collected shop data to see how the retail sector has changed since then. In 2012 they collected data on 1114 stores. Figure 39 shows that of these, 828 stores were active and 286 stores were closed. This data shows that from 2012 to 2015 there was a decrease of 19 active stores, as well as an increase in 7 closed stores.
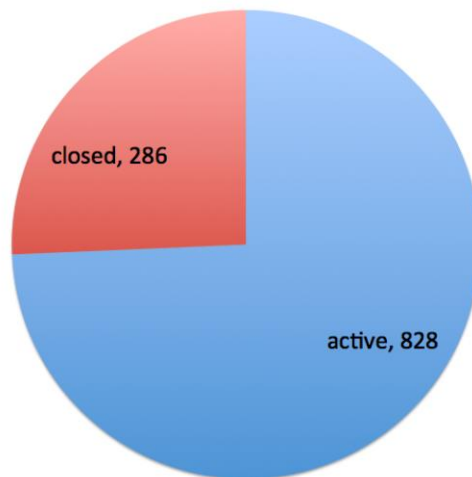
The next thing the team wanted to look at was the breakdown of active stores in 2015 by goods sold. So of the 809 active stores shown in Figure 38, Figure 40 shows how many of them sold particular products or services. From this we were able to determine that the top goods/service sold in Cannaregio for 2015 were Restaurants at 112 stores, Hotels without Restaurants at 67 stores, and Souvenir Shops at 64 stores.

This was then compared with the goods/services sold by active stores in 2012. Figure 41 shows that the top goods/services sold in Cannaregio for 2012 were Restaurants at 133 stores, Hotels at 75 stores, and Clothing Shops at 70 stores. The Others section in both Figure 40 and Figure 41 represent goods/services sold in Cannaregio with less than or equal to 5 stores. For a full listing of all goods and services sold take a look in Appendix D.
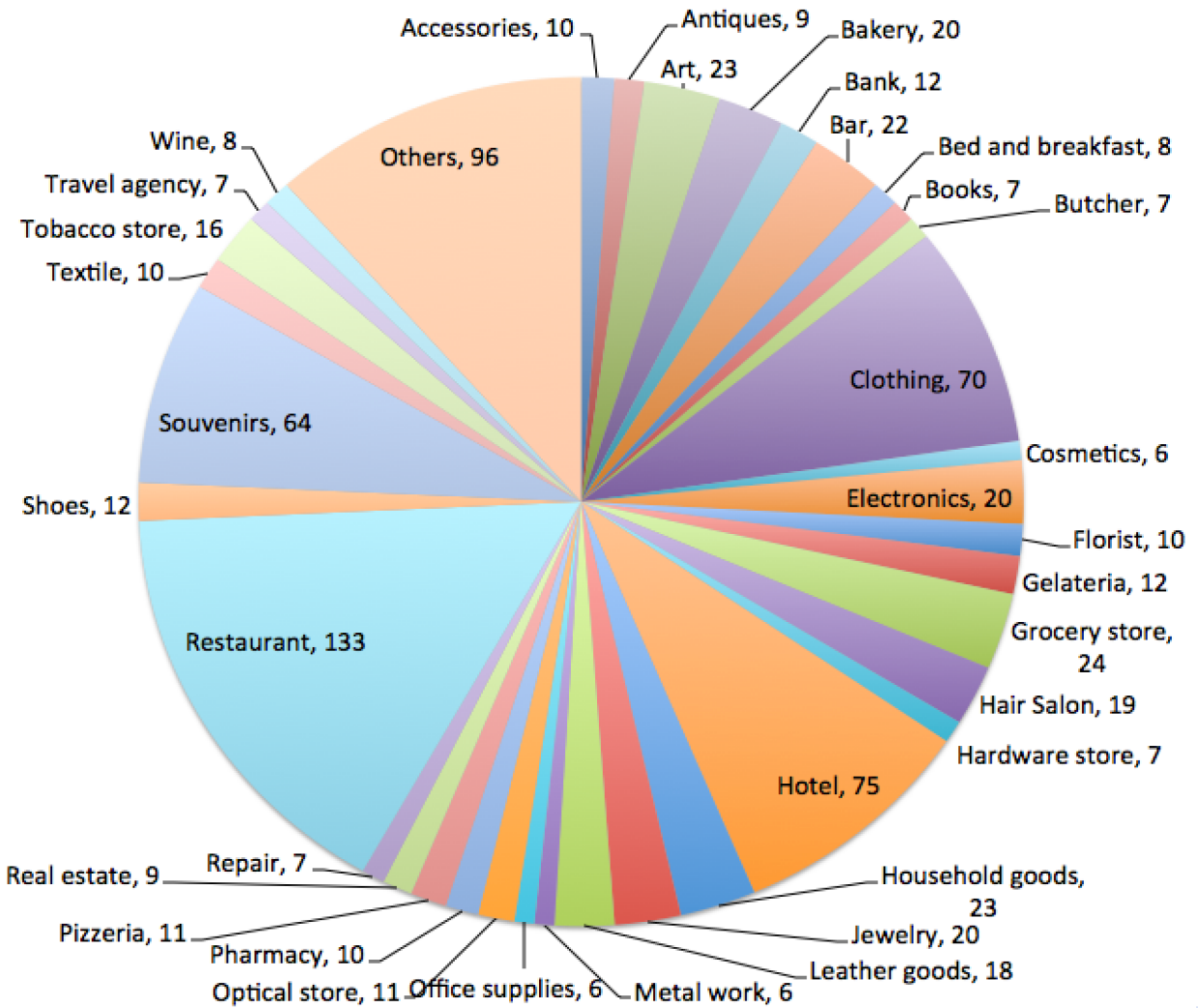
Figure 41. 2012 Breakdown of Active Stores by Goods Sold

For this year's analysis, the team took a different and more detailed approach concerning the target audience of each store and their plateatici. In past years, analysis of tourist vs. resident stores was done by assuming every store type – such as restaurant, souvenir shop, or pet store – was the same. In our case, we used a case by case determination where at the location we made a decision based on our impression of the store. This was in hopes of collecting data that better represented the reality of the Venetian retail sector. Since our method of doing this analysis was a completely different approach compared to past years, for the sake of not drawing false conclusions we did not compare our data to the historical, less accurate data. Additionally, since past groups did not look at the plateatici of each store, the team looked solely at the data collected this year.

Looking at whether stores were tourist-oriented, resident-oriented, or mixed, we once again note that this information was collected in 2015 by the team-developed Negozi mobile application. Figure 42 shows the specific breakdowns, which indicate that there

are 332 Mixed Stores, 257 Resident Stores, and 220 Tourist stores of the 809 active stores collected in 2015. From this data we can see that Tourist Stores and Mixed Stores account for more than 2/3rds of all stores in the sestieri.
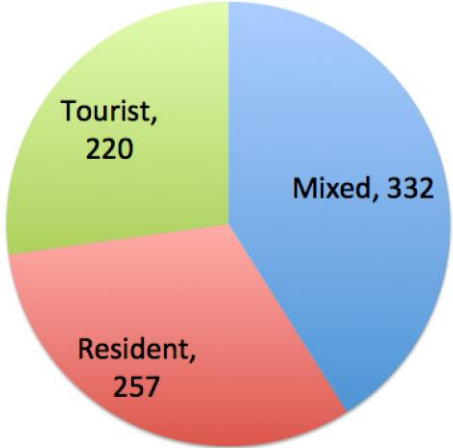
Figure 42. Number of Tourist, Resident, and Mixed Stores in Cannaregio for 2015

The team decided to look further at these results and breakdown each of the categories in Figure 42 by the goods/services these stores sold as can be seen in Figure 43, Figure 44, and Figure 45.
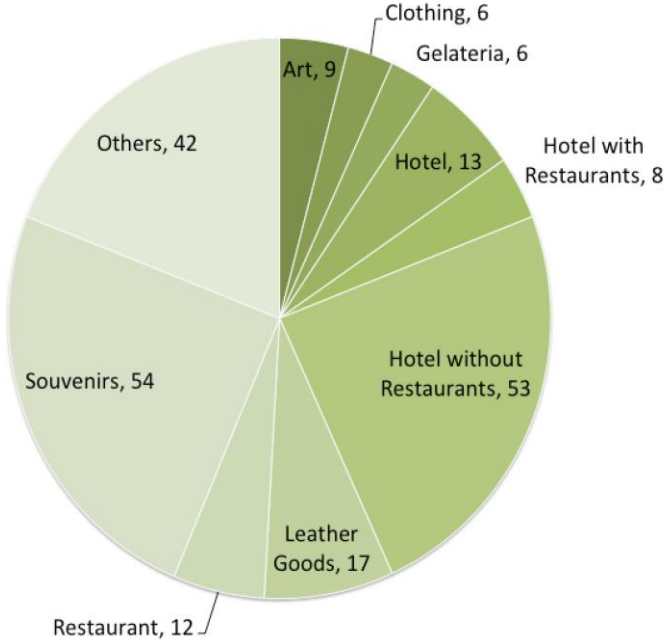
Figure 43. Active Tourist Stores Broken-down by Goods Sold (2015)
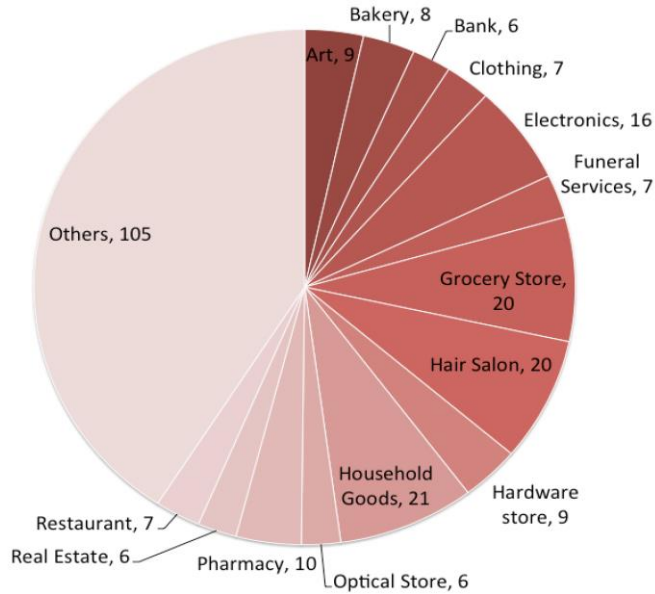
Figure 44. Active Resident Stores Broken Down by Goods Sold (2015)
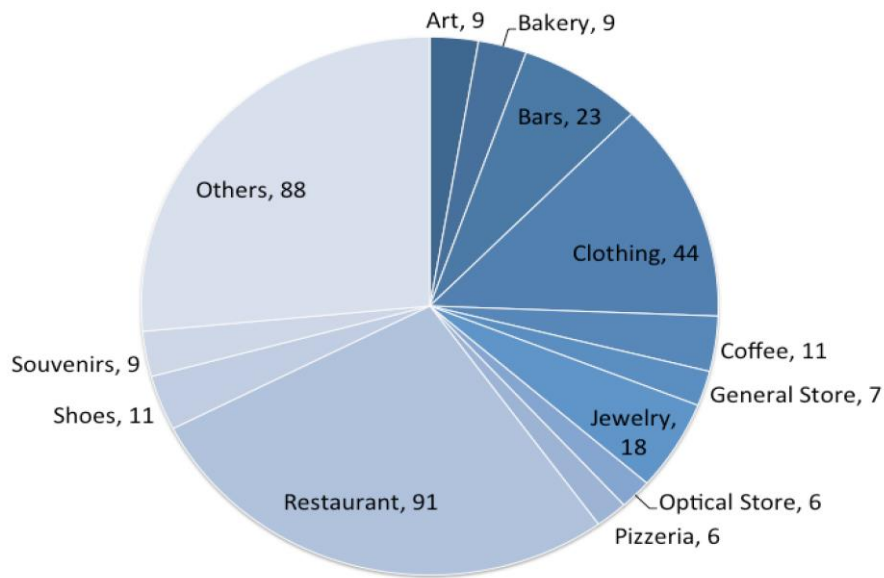
Figure 45 Active Mixed Stores Broken Down by Goods Sold (2015)

From Figure 43 we can conclude that the most plentiful tourist stores in Cannaregio in 2015 were Souvenirs Shops with 54, Hotels without Restaurants with 53, and Leather goods with 17. From Figure 44 we can conclude that the most plentiful resident stores in Cannaregio in 2015 were Household Goods with 21, Grocery Stores with 20, and Hair Salons with 20 as well. Finally, from Figure 45 we can conclude that the most plentiful mixed stores in Cannaregio in 2015 were Restaurants with 91, Clothing Stores with 44, and Bars at 23. Note that certain shops such as Restaurants and Bars could fall into any of the three categories (Tourist, Resident, or Mixed) depending on the clientele the business attracted. For that reason, even though Figure 40 we know there are 30 Bars in Cannaregio in 2015, Figure 45 shows that 23 of them were categorized

as mixed while the remaining seven were classified as either tourist or resident-specific. Lastly, the Others section in all three figures represent goods sold that have less than or equal to five stores.

Next the team investigated the breakdown of stores with and without plateatici, keeping in mind that the Negozi application allowed the team to mark whether a business had plateatici or not. Figure 46 shows that of the 809 active stores in Cannaregio for 2015 only 145 had plateatici while the other 664 did not.
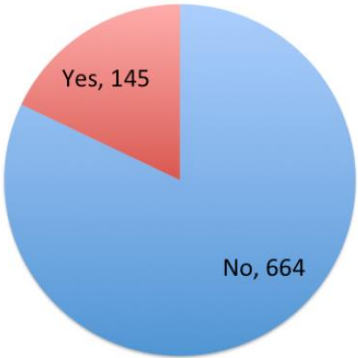
Figure 46. Stores with and Without *Plateatici*

We then decided to look closer at these 145 stores that had plateatici and broke them down by their goods sold as can be seen in Figure 47.
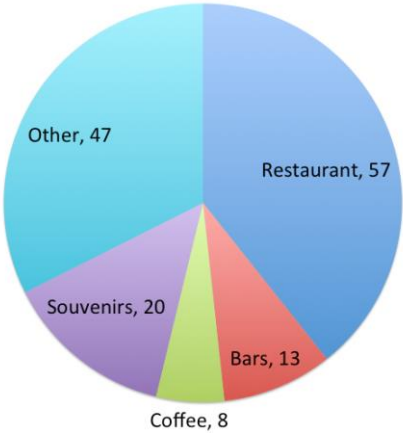
Figure 47. Breakdown of *Plateatici*

From Figure 47 we can see that Restaurants were the business that most often had plateatici coming in at 57 stores, with Souvenir Shops and Bars coming in next at 20 and 13 stores respectively. While 20 out of the total 64 souvenir shops having plateatici may seem low at first glance, this number includes stores such as mask shops and those that sell goods such as phone cases, which do not typically have plateatici. Note that the Other category is for goods/services sold with plateatici with stores less than or equal to 5.

The last part of our analysis for the data collected with Negozi in Cannaregio for 2015 was to look at where Tourist, Resident, and Mixed stores are located with respect to population density. Using the Shopp Mapp App the team was able to plot the location of every store collected

on the mobile application and overlay population totals on the island. The darker purple areas indicate a high resident population total, while a lighter purple indicates a lower population total. The team was able to use this feature to show a case where resident stores will be more concentrated in areas with high resident population. The island of San Leonardo as shown below in Figure 48 and Figure 49 has a population between 3167-3896, one of the higher values in the city. When overlaying the tourist stores collected with this island, as in Figure 48, there are a total of 37 stores displayed. However, when overlaying resident stores on this island, as in Figure 49, there are 58 stores displayed. Due to the time constraint of the project, the team was not able to incorporate a feature for automatically counting the number of shops per island, however the 2015 Island's team was able to do this given our data.
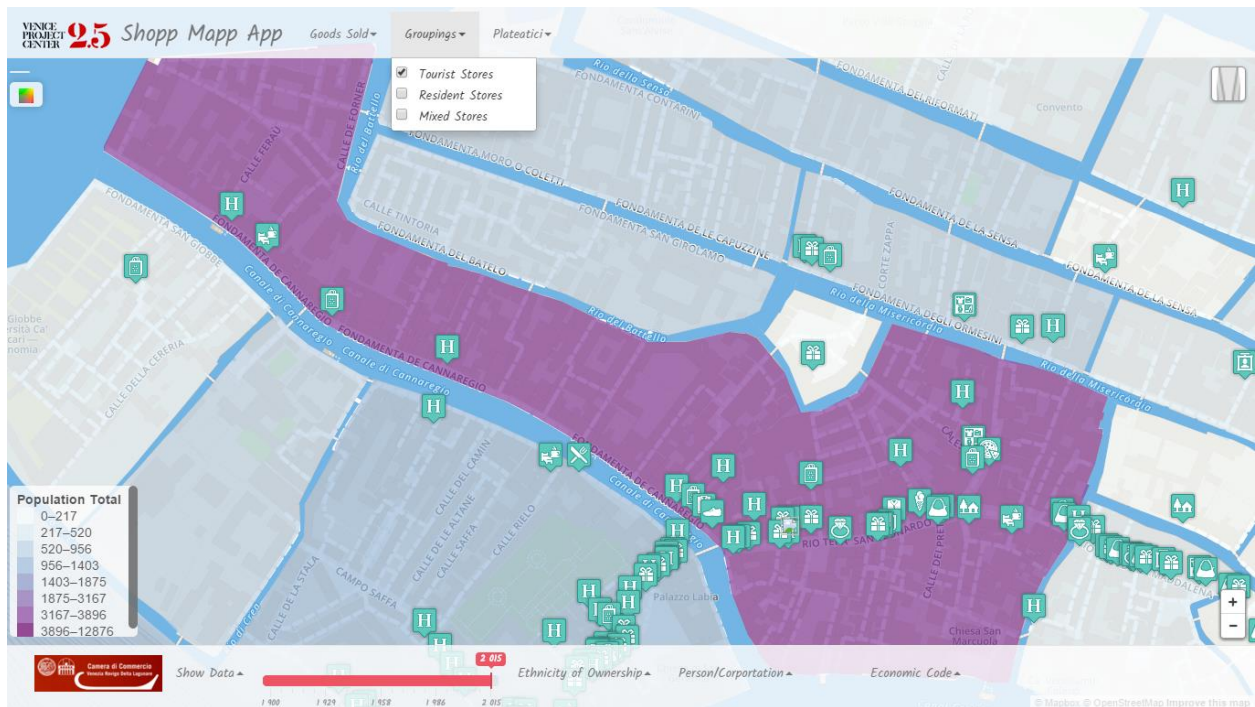
Figure 48. The 37 Tourist Stores of San Lorenzo
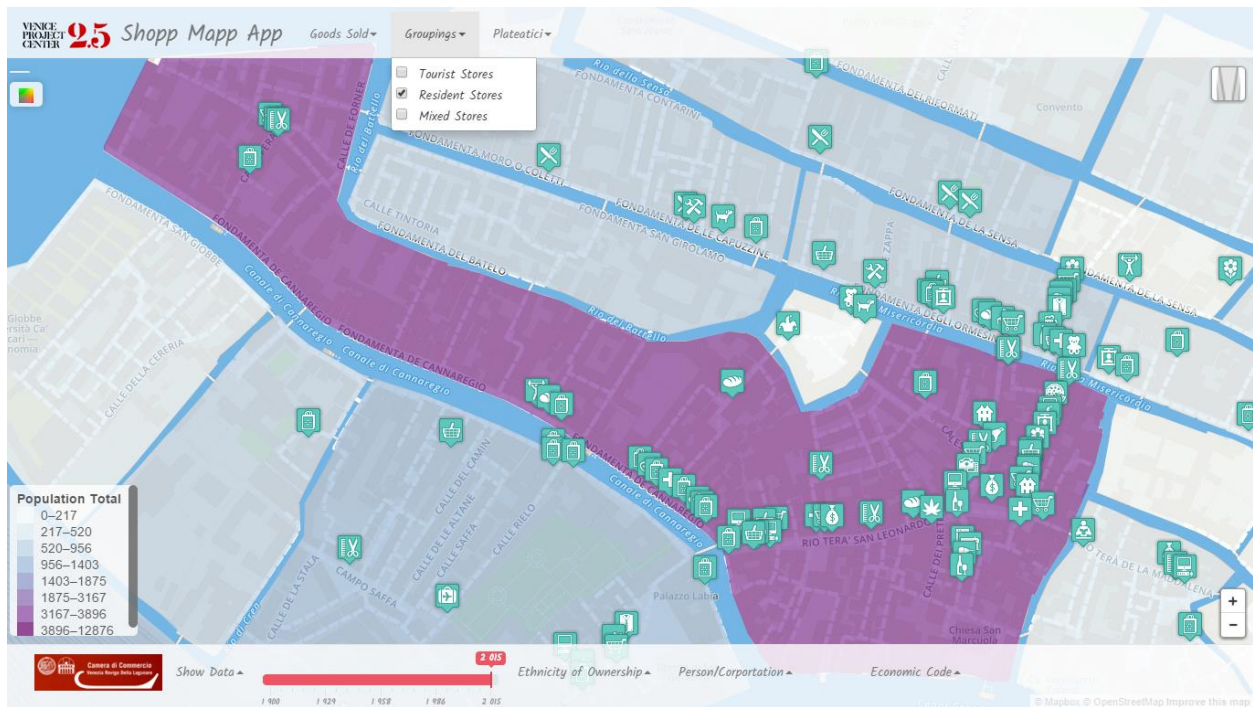
Figure 49. The 58 Resident Stores of San Lorenzo

Finally, the team also used our Shopp Mapp App to visualize trends in the retail sector that have changed over time. While there were many trends that could have been analyzed, due to the limited amount of time we looked specifically at the location of stores with regards to average age since pedestrian mobility throughout the city is a well-known problem. Upon analyzing this trend, the team noticed that it has been getting harder for elders to go to supermarkets or the closest specialty food stores, known as *alimentari*. In 2005, a resident who lived in an island with a population average age of 55-72 years old, would have to pass over three bridges to go to the closest grocery store. Nowadays, the same residents on that island have to pass four bridges instead, to go to the nearest grocery store as seen in Figure 50. The location of supermarkets may make it inconvenient for locals, and especially for elderly who need to carry groceries and walk.

Figure 50. Red Dots Are *Alimentari*, Stars Are Bridges.

4.1.4 Results and Analysis of the Data Received from the Chamber of Commerce

The chamber of commerce has given us official city data regarding the businesses of Venice. By using the Shopp Mapp App to visualize this data, we were able to look for trends in the city's retail history. As of the year 2015, there were 12,430 active businesses in Venice. Of these, there are 873 bars, 535 B&Bs, 112 groceries and 31 supermarkets. These stores were looked at in particular for our results. Since 1989, the number of active businesses in Venice has tripled. Since it is well established that the resident population of Venice is declining, it raises the question of why the number of businesses is increasing so drastically. To answer this, we looked to see if we could find a trend between the number of businesses and the tourist flow in Venice. As shown in Figure ASDF, the increase in tourism between 2010 and 2011 was accompanied by a growth in businesses, and the decrease in tourism in 2012 also saw a decrease in businesses, suggesting correlation.

Figure 51. Effects of Tourism on Businesses From 2007 to 2015

We also looked at the evolution growth – or in some cases, decline – of specific types of businesses. Among the available categorizations, the team chose to first analyze the food stores of Venice: the *alimentari* and the supermarkets. In recent years, we found that the number of *alimentari* closing has been consistently fairly high. Looking at when the *alimentari* have been closing compared to when supermarkets have been opening, the trends suggest that as local grocers close, the gap is filled by new supermarkets (Figure 52). While this is a reasonable dynamic between the two types of stores, when looking at the number of *alimentari* in the past years, despite the number that have closed, they have remained mostly steady in their count.
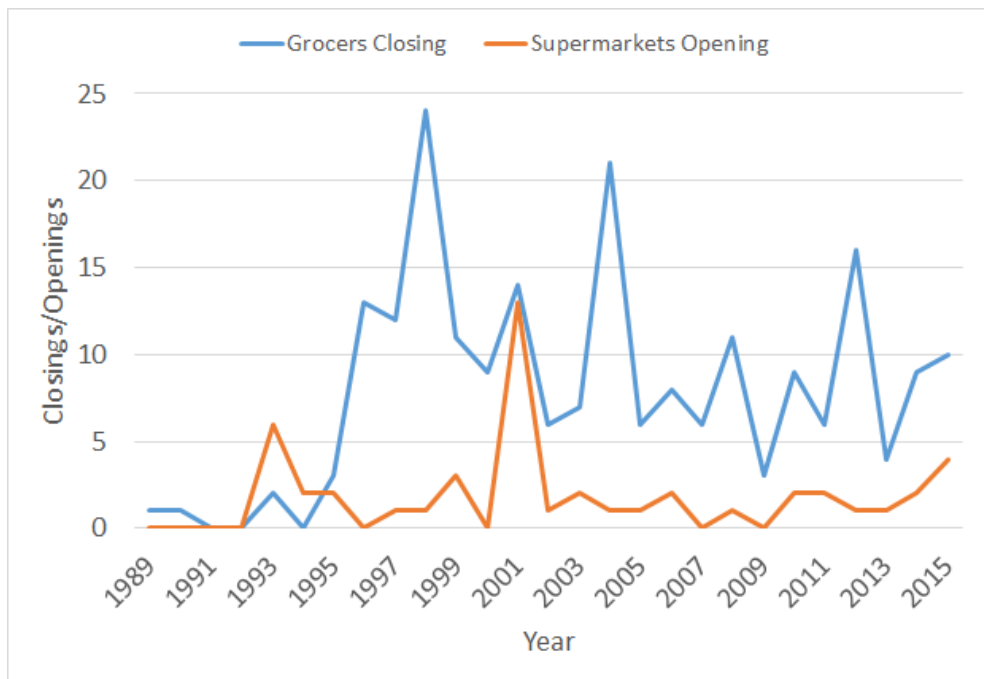
Figure 52. Grocers Closing vs. Supermarket Openings From 1989 to 2015

58

We speculate that the tourist population may be helping to sustain these food stores. As seen in Figure 53, the existing *alimentari* in 2015 are located in areas of low residential population and are in close proximity to hotels and bed and breakfasts. Tourists renting apartments, staying in hotels or spending the night at B&Bs, themselves, are helping to keep the alimentary open.
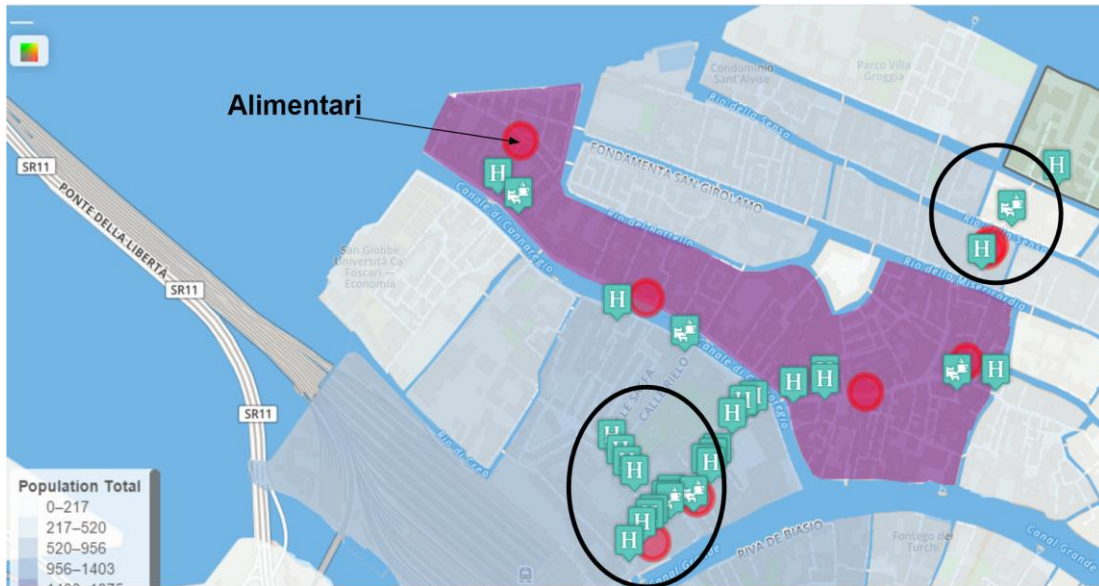
Figure 53. Relationship Between B&B's and *Alimentari*

As one can see from Figure 54, the number of active Bed and Breakfasts (B&Bs) has increased dramatically since 2000. That year, a Jubilee was held for the two thousandth anniversary of the birth of Jesus. Since Venice expected to have a huge influx of visitors for the event, the city relaxed laws regarding what could officially be considered a B&B. As a result, the number of active B&Bs has gone up significantly since 2000 and continues to rise with the support of the increasing tourist population.
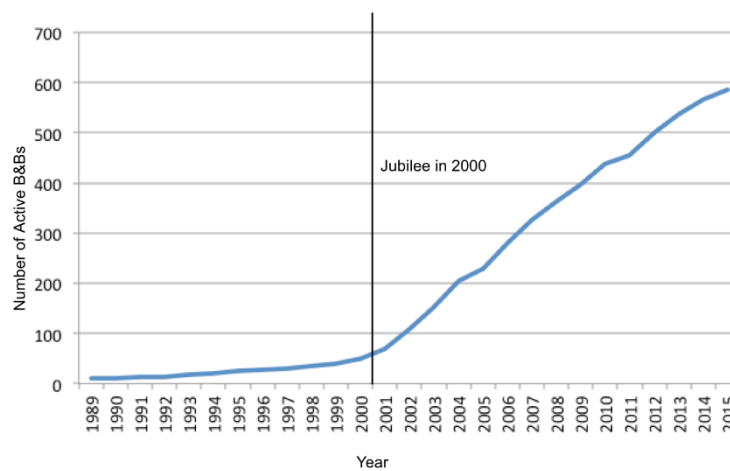
Figure 54. B&B's Since 1989

Overall, that state of food stores in Venice seems stable. While it may seem so at first, with the number of *alimentari* closing, in reality there are plenty of food stores that remain. In fact,

the situation may be helped by tourism in the city. Venice has one food store for every 391 residents, while in comparison the nearby Mestre has one food store for every 624 residents,

The graph shown in Figure 55 shows how the number of active bars in the city has tripled since 1989 despite the decline in resident population. This means that most active bars are catering to the increasing tourist population in Venice, and that more are opening every year to meet the demand from their growing customer base, specifically near Rialto and on Strada Nuova.
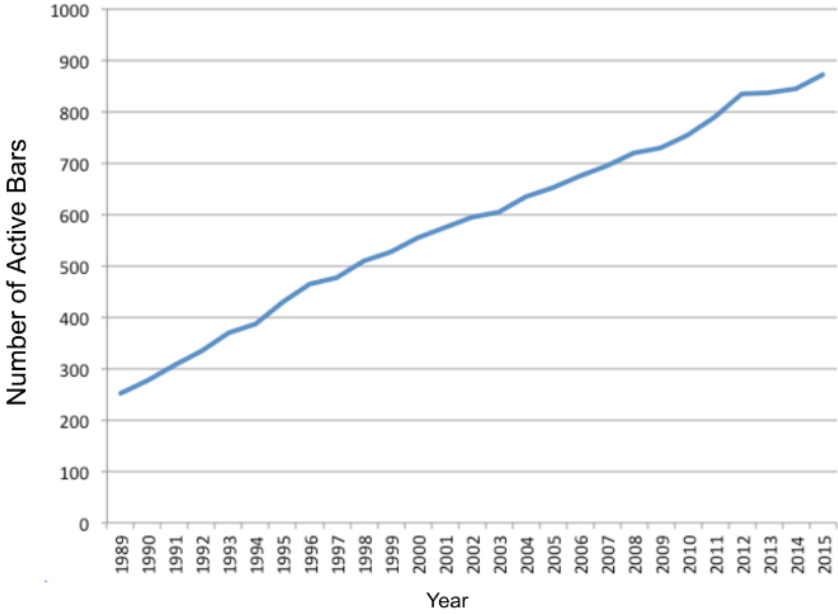
Figure 55. Number of Bars Since 1989

Another important feature that we included in our Shopp Mapp App is the ethnicity of the businesses owners. Unfortunately, we didn't have the ethnicity of every active business for 2015, but we were only given the ethnicity of the sole proprietors. There is a total number of 4461 sole proprietors in Venice. Based on this information, Figure 56 and Figure 57 shows the top eleven ethnicities, followed by the number of the businesses they own.

1. Venezia (1300)
2. Italy (795)
3. China (354)
4. Bangladesh (248)
5. France (150)
6. Egypt (111)
7. United Kingdom (91)
8. Moldavia (77)
9. United States (51)
10. Romania (45)
11. Argentina (35)
12. Other Ethnicities (2000)

Figure 56. Ranking of the Top 10 Ethnicities
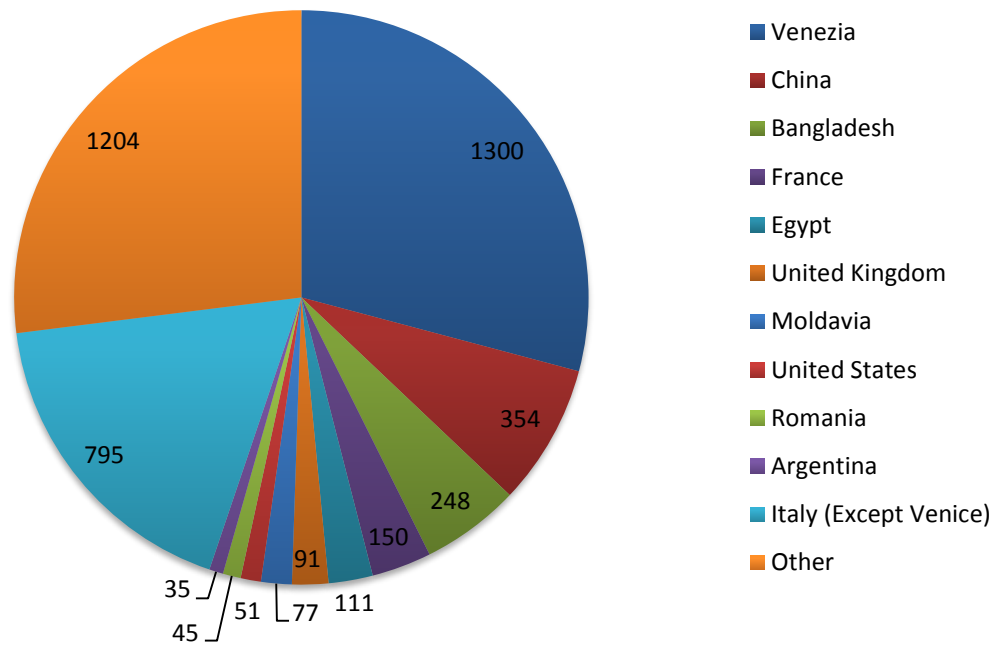
Figure 57. Visual Representation of All Ethnicities

From the above information, we can see that Venetians, own the largest number of individual business, however, they only comprise one third of the total. After Venetians, the top two ethnicities are Chinese and Bangladeshi. Our team looked at some interesting trends of these two ethnicities.

Figure 58 Map of Active stores owned by Chinese in 2015 as per Chamber of Commerce Data

Figure 58 shows a map with all businesses owned by Chinese people. These businesses are located along the main routes, across San Marco and Rialto Bridge. We also noticed that the Chinese people own 32% of the total leather bag stores, while Venetians only own 12 % of them. This means that about 88% of all leather bag stores owned by sole proprietors are owned by non-Venetians, thereby invalidating the authenticity of most leather stores. The next ethnicity the team looked at were the Bangladeshis. They are also located along the main routes, across Strada Nuova and Rialto Bridge. Bangladeshi's own 37% of all the individually owned souvenir stores in Venice while Venetians own about 32% and all other ethnicities make up the final 31%. This data shows that 2/3rds of souvenirs stores owned by sole proprietors in the city are owned by non-Venetians.

4.2 A System for the Management of Public Space

In Venice, the plateatici are abundant along the streets of the city. This usage of public space, made up largely of tables and chairs, are currently regulated in ways that are fairly arbitrary. Additionally, plateatici can cause a variety of inconveniences for the local. In order to aid in alleviating these issues, the team proposed a new system of regulation for the leasing of publics space.

4.2.1 The Tool for Renting Outdoor Space

Building on the plan created by Carrera et al., the team determined the final details necessary to thoroughly execute the plan.[39] This system takes both the general regulations for outdoor space and the *pianini* and combines them into one, a system we deemed the Online Plateatici Management System, or OPMS.

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[39] (Carrera et al., 2006)

The OPMS allows business owners to rent the area outside of their business through a web app. This app would cover the entire city of Venice, thus negating the use of two separate systems. The OPMS would predetermine the total area that a business would not be able to rent first. These would be the areas of respect, as shown in Figure 59, wherein what is left will be available to business owners. The app will present the owner with the cost for renting the outdoor space, adjusting as the area is changed. This area would be determined through a number of steps, which are outlined in Figure 59.

Areas of Respect
- Space outside of businesses and homes
- Area around historical monuments
- Space around corners of buildings

Pedestrian Walkways
- Space determined by actual pedestrian traffic counts
- Should allow for decent traffic flow

Area of *Plateatici*
- Find the area proportional to the inside
- Subtract any area from the *plateatici* that conflicts with areas of respect/walkways

Figure 59. Determining Size of *Plateatici*

To figure out the size of the *plateatici*, the OPMS would remove the space occupied by areas of respect around monuments and in front of homes. The area of respect around the monuments could be set as a standardized amount; for example, the area could be defined as a 3-meter width from the face of the monument, circling it entirely. For the space in front of houses, there should be a path the width of the building entrance that extends to the pedestrian pathway. The corners of buildings should only have a 1-meter square zone marked off, as the purpose of this space is to protect people who are walking close to the corners from running into a table.

With the areas of respect defined, the app would then look at the pedestrian walkways through the area. These walkways would be determined in an impartial manner, so that every business is treated fairly, and so that the proper amount of space is left for pedestrian traffic. To do this, the city would set up a system of cameras, pictured in Figure 60, which would record the number of pedestrians that walk on the street or cross through the square.
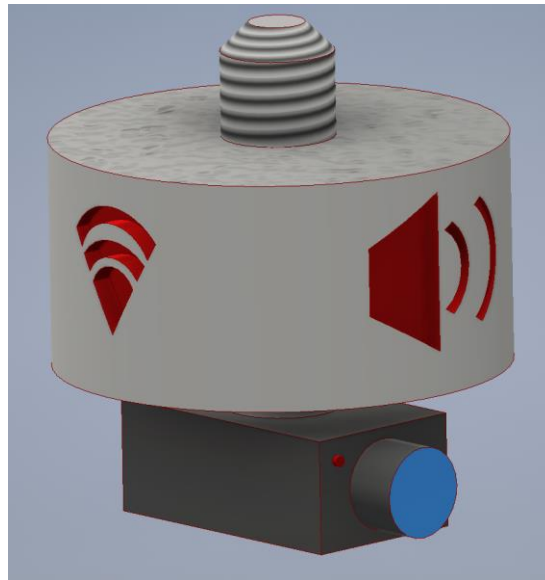
Figure 60. Camera Units for Pedestrian Counting

These camera units could be screwed into any light bulb socket, allowing the city to install them anywhere that is deemed necessary. The pedestrian traffic data recorded by the cameras could then be uploaded to a pedestrian counting software, like Placemeter, to calculate the traffic flow throughout Venice. Another VPC team conducted a viability study on Placemeter's technology, which could be used to ensure the data collected by these cameras is useable.

Figure 61. Placemeter Software Counting Pedestrians

Placemeter calculates the number of people who enter and leave an area, allowing the OPMS to figure out the amount of space needed for pedestrian walkways to allow a steady flow of traffic. One way that the OPMS could do this would be to determine the Level of Service for the streets and squares. Level of Service is a formula that gives a grade for a street based on the ability of traffic to flow.[40] This can be used specifically for pedestrian traffic, which would give the OPMS an impartial system for ranking each street. The system would seek to maintain a good

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[40] (Bloomberg & Burden, 2006)

flow of traffic, where pedestrians would be able to move at their own pace, without having to change their route drastically to avoid others. This is defined as a B grade by the Level of Service guide, and is the level that the OPMS should seek to maintain throughout the city.[41]

With these spaces defined, the OPMS can determine the area of the plateatici by taking the space of the areas of respect and the space of pedestrian walkways. The area left for *plateatici* would be broken into 1 meter square blocks, thus creating a grid.(Figure 62)
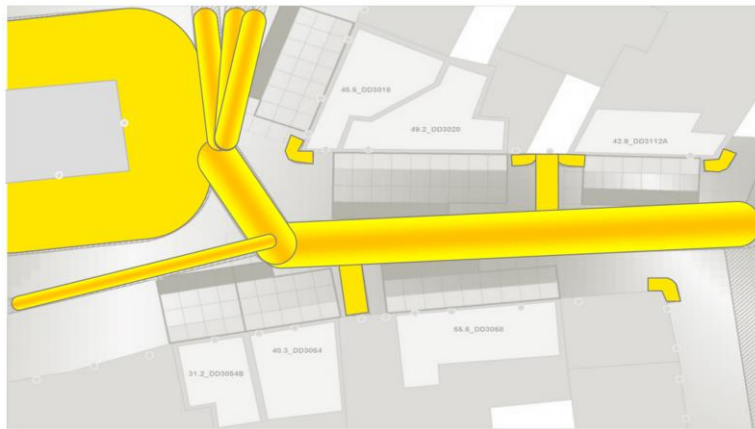
Figure 62. *Plateatici* Grid

These grids would then color coded by the cost of renting them, wherein green squares were the least expensive, and red squares were the most expensive. This system would be designed so that as the business got closer and closer to areas of respect or walkways, the price to rent would increase.

Figure 63. Color Coded *Plateatici*

In this way, we could discourage businesses from purchasing space close to the areas of respect. This will keep the *plateatici* from encroaching on the walkways, keeping traffic flow up. The first 1 square meter area in front of a store would be leased at a low, reasonable price, since

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[41] (Bloomberg & Burden, 2006)

this area would only be used to display postcard stands or signs, objects that don't impinge on traffic as much.

The OPMS would also take into account the visual obstruction of monuments and other historic artifacts. In order to dissuade bars and restaurants from using large umbrellas, which can hide the beauty of Venice, a cost per area of visual obstruction would be added on top of the rent for the area. This cost would be determined by the amount of obstruction caused by the umbrellas, potentially using the camera system that will be set up to determine traffic flow. These cameras would cover the monuments in square meter grids, and shade the grid based on obstruction; red being totally obstructed and green being no obstruction. (Figure 64)
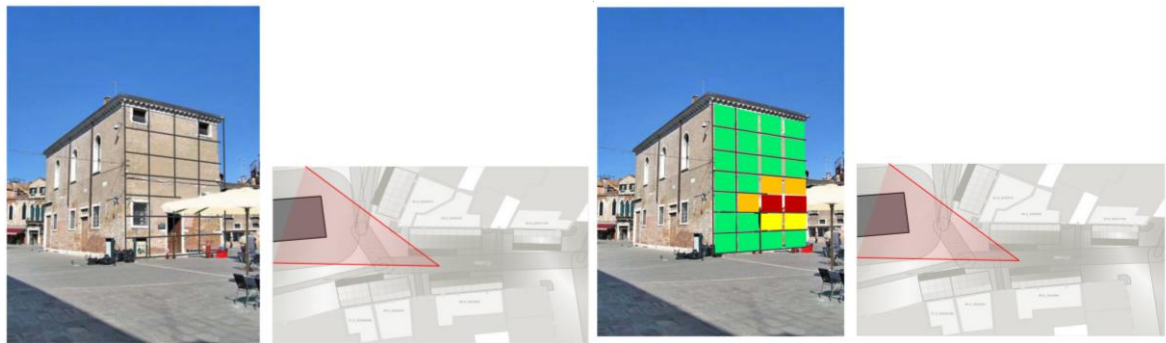
Figure 64. Visual Obstruction Calculator

This added cost of visual obstruction will help to persuade business owners away from using large umbrellas and other unsightly obstructions, returning the streets of Venice to their original appearance.

The final area that the OPMS will cover is the noise generated by *plateatici*, especially that made by bars and restaurants at night. This area is not covered under *pianini* or the general regulations, despite being a problem that effects many local Venetians. Our system would seek to discourage noise in two main ways; raising rates for certain businesses, and raising rates at night. First, the system would make all area after the initial one-meter square buffer zone more expensive for bars and restaurants during the day, to help limit the impact they have.
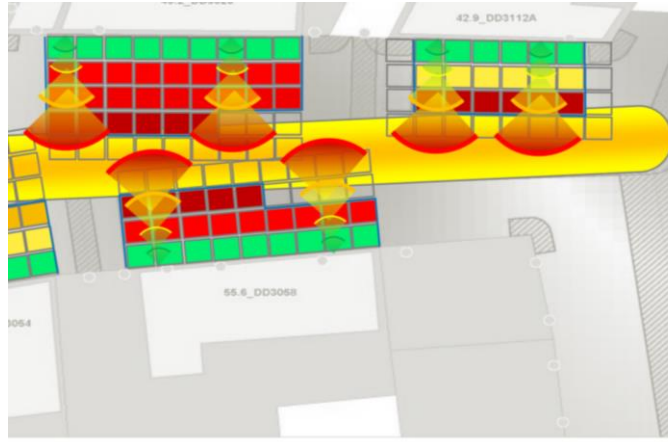
Figure 65. Adding Noise to the Equation

Next, the OPMS would have a Night Mode, where the rent for the whole *plateatici* would be raised, including the one-meter square buffer. At night, the only businesses using *plateatici* are bars and restaurants, so the low cost zone will not be necessary.
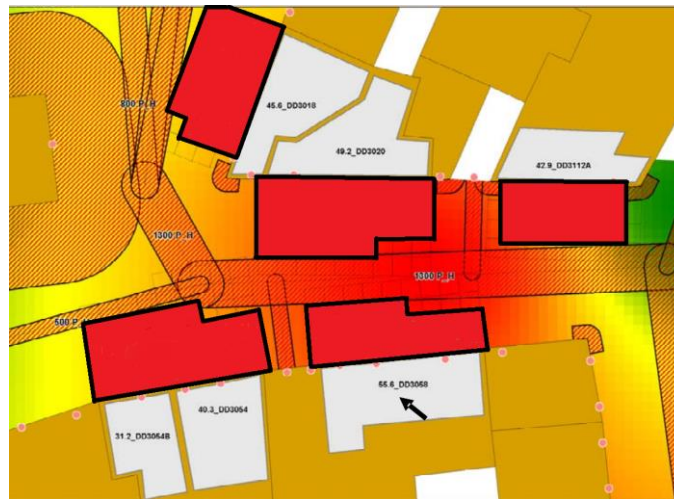
Figure 66. Night Mode, All *Plateatici* In Red

By raising the price at night, the city could also pull in more revenue at that time, allowing them to further ameliorate some of the problems with *plateatici*. By using this revenue to buy locals sound proof windows, and air-conditioning units to assure that these windows stay shut, the city could further help to reduce the problems associated with *plateatici*.

4.2.2 Enforcing the OPMS

Just having the OPMS will not be enough to ensure that order is maintained with the *plateatici*. We need a system that will be able to monitor what area businesses are actually occupying and the noise they are actually creating. The team devised a system to do just that,

through both quantitative and qualitative methods.

With the type of camera and software mentioned earlier (Figure 60), we can both monitor the size of and record sound levels generated from *plateatici*. A software could be made to overlay a grid on the physical *plateatici*, ensuring that the shop owners do not overstep the area that they have rented, as seen in Figure 67. This system would thus reduce the number of times police would have to check on *plateatici*, as a quick visual inspection could be done from afar.

Figure 67. Grid Overlay on *Plateatici*

Using the microphone available with the cameras, the system could also record the sound levels created by *plateatici*. Working with Venice Noise, the OPMS could generate a noise heat map for all of Venice. This map could be used first to calculate the increase in the cost of leasing an area if it is considered loud, as mentioned in chapter 4.2.1 (Figure 65). With this baseline established, the camera units could then be moved around to areas where residents have made complaints. The microphones could then be used to ensure that these areas stay within the preset noise levels, and automatically generate notifications in areas where these levels are exceeded. This would alert the police, who could investigate into exactly which business is creating the most noise at night.

Supplementing these two quantitative measures would be a qualitative system, allowing locals to voice their concerns and help with policing these regulations. Using Venice's preexisting complaint system, IRIS, a citizen could lodge a complaint about a business exceeding the bounds of their *plateatici*, or indicate if a certain business was being loud or unruly. Since the OPMS allows public access to the records on *plateatici*, local Venetians would be able to visually verify if a businesses was within its bounds. This helps to fill in any of the gaps there might be with the camera units; for example, if the view of the camera became obstructed, or if there was a computer glitch that effected the camera in some way. IRIS complaints about noise would also allow the police to pinpoint which business was being loud and exceeding the set noise levels, helping to streamline the investigation process. There is currently no way to make a specific complaint about noise or encroachment, but this functionality could be easily added. Locals would use the mobile version of the app (Figure 68)

to upload snippets, and tag the business that it is associated with.
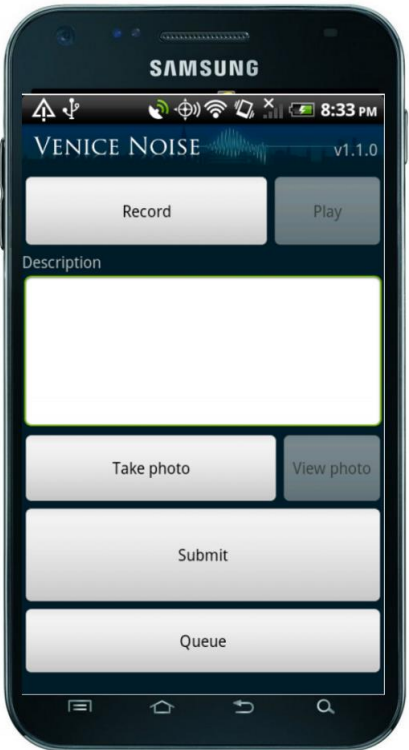

Figure 68. Mobile Version of Venice Noise

By using these quantitative and qualitative checks in tandem, the city should be able to better regulate and keep an eye on the *plateatici*. This system should ensure that police can spend more time ensuring the safety of the Venetians, and wasting less time on measuring tables and chairs.

5. Recommendations

For future IQPs

Regarding the Mobile Application Negozi:

- Be able to fill in Negozi with past data collected by teams (such as pictures, good sold, store type, etc) to make the data collection more efficient and accurate
- Be able to upload multiple pictures of a store for a given year with Negozi
- The mobile application experiences frequent crashes too, whether it is run on a smartphone or computer. The team was not able to investigate the cause of this issue, but suspect it could be attributed to memory problems or poor resource management.
- The GPS functionality could also be tweaked to improve user experience. Currently, stores that are within the radius of 70 meters are listed, but in the order that they appear in the firebase records. Instead, this could be improved to list in an order based upon distance from the user.
- Finally, there could be an added option to edit the radius in which stores will be listed. For crowded areas especially, it would be helpful to control the number of results generated.

Regarding the Desktop Application Shopp Mapp App:

- Add more economic codes to the filter on the application
- Add another groupings class such as "food stores" vs. "non-food stores" that could select more than one good sold quickly
- One issue that we did not have time to solve was that the loading screen would finish after the WPI data loaded, but the chamber of commerce data had not yet loaded. This does not affect the functionality of the WPI menu options, but the chamber of commerce data buttons will not do anything until the data has actually loaded.
- Currently, all data points are represented on the map as red dots. Future teams could improve upon this by adding icons specific to the chamber of commerce, and also adding the ability to customize the color of certain icons.

Regarding the Analysis of the Chamber of Commerce Data

- Further analysis should be performed to find even more trends and conclusions
- Future teams should try to build a clean and better organized spreadsheet of the data, as the version we received was very difficult to use in its current state.
- If city data is acquired again, future teams can analyze further changes as time progresses, following the same trends we followed or their own new trends they've observed

Regarding the Online Plateatici Management System

We would like to suggest the city to, in the near future, adopt our new system for the management of public space. The team feels that, while the current regulations are functional, they can be greatly improved upon. Since one of the biggest challenges of the current system is its inability to accommodate for the changes within the city, the sooner a more adaptable plan is

implemented the better. As it stands, the pianini will keep needing to be generated and updated for problem areas, an expensive and timely procedure. Our proposal will allow for not only a more comprehensive solution to the organization of the plateatici, but also for a solution that can adapt as the face of the city changes as well.

In addition to this the team also suggests the following for future teams:

- Future teams could develop a reasonable equation that could be used to calculate the percentage of the road can be taken up by plateatici based on the numbers from the counts by performing pedestrian counts.
- Future projects can also try to obtain data for the stalls and platetatici in Venice. With stalls information, the captured image of the Venetian retail sector can be that much more complete.

To conclude, the team was successfully able to create a tool for the documentation and analysis of the retail sector of Venice. By implementing it, the team searched for trends and performed analysis of both data collected in the field and data received from the chamber of commerce. We were able to find trends by visualizing the location and number of different types of stores across the city. For example, since 1989, a number of *alimentari,* or local food grocers, have been closing. To fill that gap, the team saw that the pattern of supermarkets opening followed this closing of the local food stores. With supermarkets on the rise, and looking at the locations of *alimentari* that have managed to remain open, the team saw that there is a good chance that tourists have been sustaining the local food markets. The team was also able to show a strong association between the rise of tourism and the recent increases in both bars and bed and breakfasts. In addition, analysis showed that both the Chinese and Bangladeshis were operating businesses that were catering largely to tourists, in both goods sold and location.

The team's investigation of the regulations on public space showed that there was great room for improvement. The current system was needlessly complicated, and in many cases, largely arbitrary. The team left behind a blueprint, proposing a new system for the management of the plateatici that would be numbers based and publicly accessible. We hope that it will be taken into consideration by the city and implemented to handle regulations in the future.

Appendix A

Interview Questions

Name of Interviewee: Claudio Sensini
Head of the Urban Spaces Division, Comune di Venezia

What are the different ways public space can be occupied in Venice? (Plateatici, Stall, Kiosks, Posteggi Ambulanti, Edicola, Banchetti)

What are the current procedures for determining the size of a plateatici, what is the cost to shop owners, what are the shortcomings?

How does the ranking system for applying for plateatici work?

How are pianini determined? What are their shortcomings? Are they the only way of regulating the public space used by the plateatici?

How are they (pianini) enforced? (Scheduled checks on size or based on complaints?)

What are the fines for exceeding boundaries?

What was the precedent set for the revenue per square meter that a plateatico takes in?

Are there any methods being used to dissuade the renting of plateatico? I.E. requirements for bathrooms based on number of chairs

How are shop owners informed about laws?

How are shop owners being informed about noise levels and restrictions?

What is being done, if anything, about potential mitigation/compensation of locals?

Do you think the current system of leasing plateatici work? Are there any areas that you believe could be improved?

Where is map of traffic levels, how were they determined?

What is the city's 'commercial plan', i.e. what stores are allowed to operate where? Can we get a map of this?

How many pianini are there?

Appendix B

The Shopp App Code can be viewed at https://github.com/cityknowledge/ckconsole.

The Shopp Mapp App Code can be viewed at https://github.com/Kygandomi/Shops_Map_App

Appendix C

L'airone sas 3 aree concesse 25mq+16mq+15mq = **56mq**

(su area potenzialmente concedibile di ca. 75 mq)

Calcolo secondo parametri del Regolamento:

- **Categoria 3 = 45,15€**
- pubblici esercizi = 1,82
- **Valore area 3 (rilevante pregio artistico) = 1,5**
- percentuale spazio disponibile 15,01-50% = 1,5
- **senza installazioni = 1**
- spazio non adiacente all'attività = 1,2
- **concessione senza limiti orari = 1**

TOTALE = 221,87 x 56 mq concessi = **12.424,44 €**

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Venezia pub srl aree cocesse = **28mq**

Calcolo secondo parametri del Regolamento:

- **Categoria 3 = 45,15€**
- pubblici esercizi = 1,82
- **Valore area 3 (rilevante pregio artistico) = 1,5**
- percentuale spazio disponibile fino a 15% = 1
- **senza installazioni = 1**
- spazio adiacente all'attività = 1
- **concessione senza limiti orari = 1**

TOTALE = 123,26 x 28 mq concessi = **3.451,28 €**

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Il Caffè Chiapolin e Levorato snc, aree concesse 18mq + 30mq = **48mq**

Calcolo secondo parametri del Regolamento:

- **Categoria 3 = 45,15€**
- pubblici esercizi = 1,82
- **Valore area 3 (rilevante pregio artistico) = 1,5**
- percentuale spazio disponibile 15,01-50% = 1,5
- **senza installazioni = 1**
- spazio non adiacente all'attività = 1(18mq) + 1,2 (30mq)
- **concessione senza limiti orari = 1**

TOTALE = (184,89 x 18 mq adiacenti) + (221,87 x 30mq distaccati) = **9.983,97€**

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La refusa sas aree concesse = **6mq**

Calcolo secondo parametri del Regolamento:

- **Categoria 3 = 45,15€**
- commercio al minuto = 1 (forse ricade in 0,8 ??)
- **Valore area 3 (rilevante pregio artistico) = 1,5**
- percentuale spazio disponibile fino a 15% = 1
- **installazioni inferiori a 4 mq = 1**
- spazio adiacente all'attività = 1
- **concessione senza limiti orari = 1**

TOTALE = 67,725 x 6 mq concessi = **406,35€**

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Marchetto Alberto aree concesse = **25 mq**

Calcolo secondo parametri del Regolamento:

- **Categoria 3 = 45,15€**
- pubblici esercizi = 1,82
- **Valore area 3 (rilevante pregio artistico) = 1,5**
- percentuale spazio disponibile 15,01-50% = 1,5
- **senza installazioni = 1**
- spazio adiacente all'attività = 1
- **concessione senza limiti orari = 1**

TOTALE = 184,89 x 25 mq concessi = **4.622,25 €**

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Ongaro Michele aree concesse = **36 mq**

Calcolo secondo parametri del Regolamento:

- **Categoria 3 = 45,15€**
- pubblici esercizi = 1,82
- **Valore area 3 (rilevante pregio artistico) = 1,5**
- percentuale spazio disponibile 15,01-50% = 1,5
- **senza installazioni = 1**
- spazio adiacente all'attività = 1
- **concessione senza limiti orari = 1**

TOTALE = 184,89 x 36 mq concessi = **6.656,04 €**

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Memaj Petrit aree concesse = **40,6 mq**

Calcolo secondo parametri del Regolamento:

- **Categoria 3 = 45,15€**
- pubblici esercizi = 1,82
- **Valore area 3 (rilevante pregio artistico) = 1,5**
- percentuale spazio disponibile 50% = 2
- **senza installazioni = 1**
- spazio adiacente all'attività = 1
- **concessione senza limiti orari = 1**

TOTALE = 246,52 x 40,6 mq concessi = **10.008,71 €**

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Orange srl aree concesse = **50 mq**

Calcolo secondo parametri del Regolamento:

- **Categoria 3 = 45,15€**
- pubblici esercizi = 1,82
- **Valore area 3 (rilevante pregio artistico) = 1,5**
- percentuale spazio disponibile 15,01-50% = 1,5
- **senza installazioni = 1**
- spazio adiacente all'attività = 1
- **concessione senza limiti orari = 1**

TOTALE = 184,89 x 50 mq concessi = **9.244,5 €**

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Avvenire sas aree concesse = **35,7 mq**

Calcolo secondo parametri del Regolamento:

- **Categoria 3 = 45,15€**
- pubblici esercizi = 1,82
- **Valore area 3 (rilevante pregio artistico) = 1,5**
- percentuale spazio disponibile 15,01-50% = 1,5
- **senza installazioni = 1**
- spazio adiacente all'attività = 1
- **concessione senza limiti orari = 1**

TOTALE = 184,89 x 35,7 mq concessi = **6.600,57 €**

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Antico Capon aree concesse = **71,5 mq**

Calcolo secondo parametri del Regolamento:

- **Categoria 3 = 45,15€**
- pubblici esercizi = 1,82
- **Valore area 3 (rilevante pregio artistico) = 1,5**
- percentuale spazio disponibile 15,01-50% = 1,5 (ma potrebbe essere 2)
- **senza installazioni = 1**
- spazio adiacente all'attività = 1
- **concessione senza limiti orari = 1**

TOTALE = 184,89 x 71,5 mq concessi = **13.219,64 €**

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Pierre Dickens Inn aree concesse = **115 mq**

Calcolo secondo parametri del Regolamento:

- **Categoria 3 = 45,15€**
- pubblici esercizi = 1,82
- **Valore area 3 (rilevante pregio artistico) = 1,5**
- percentuale spazio disponibile 15,01-50% = 1,5 (ma potrebbe essere 2)
- **senza installazioni = 1**
- spazio adiacente all'attività = 1
- **concessione senza limiti orari = 1**

TOTALE = 184,89 x 115 mq concessi = **21.262,35 €**

Appendix D

Accessories

Antiques

Apartment Rental

Art

Bakery

Bank

Bar

Bars

Bed and breakfast

Bed and Breakfasts

Boat supplies

Books

Butcher

CClosed

Closed

Clothing

Coffee

Cosmetics

Dairy

Dry cleaner

Electronics

Entertainment

Exchange

Fitness

Florist

Funeral Goods

Funeral Services

Furniture

Gelateria

General Store

Graphic Design

Grocery Store

Hair Salon

Hardware store

Hostel

Hotel with restaurant

Hotel with Restaurants

Hotel without Restaurants

Household Goods

Jewelry

Knives

Leather Goods

Liquor

Lodgings

Masseuse

Medical Goods

Money Transfer

Nail salon

Newspaper

Office supplies

Optical Store

Other Retail

Perfume

Pet Store

Pharmacy

Photo store

Photocopy

Photographer

Pizzeria

Produce

Real Estate

Repair

Restaurant

Seafood

Shoes

Souvenirs

Spa

Stationery

Tailor

Tattoo and Piercing

Tobacco

Tobacco store

Toys

Transportation

Travel Agency

Undergarments

Wine

Wood work

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