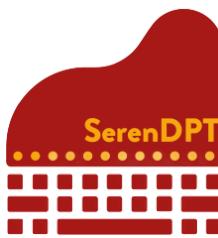# Analyzing the Evolution of Commerce in Venice

An Interactive Qualifying Project Report submitted to the faculty of Worcester Polytechnic Institute in fulfillment of the requirements of the Degree of Bachelor of Science

Submitted By: Deepti Gosukonda, Patrick Daly, and Kody Robinson

Submitted To: Fabio Carrera and Lorraine Higgins

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SMARTDEST

SerenDPT

Author Contributions

Patrick Daly contributed to the writing and editing of the final project report. He did much of the data collection, visualizations, and deliverable creations.

Kody Robinson contributed to general debugging of the web application. He did much of the data collection and visualizations. Additionally, wrote part of the executive summary and technical addendum.

Deepti Gosukonda contributed to the debugging of the web application. She wrote python scripts to help with data analysis. She also wrote part of the exec summary and technical addendum, and collected much of the data.

Abstract

Tourism has been blamed for the recent closings of local Venetian stores. However, this is an open question. SmartDest, a European research initiative, explores the relationship between tourism, commerce, housing, and mobility in major cities. This project, in partnership with Venetian benefit organization SerenDPT, contributes to SmartDest by providing a fully updated inventory of all retail and hospitality businesses in Venice. We improved an existing mobile application to record shop data collected through direct observation, noting and analyzing shop types, location, target customer, and trends in turnovers. This application and database provides a baseline for more detailed future analyses of commerce trends in the historic city.

Introduction: Venetian Commerce in the Context of Rising Tourism and Depopulation

Since its inception in the 5th century, Venice has always been a major center of commerce, as summarized in **Figure 1**. Historian and professor Angus Maddison (2001) has written about the history of commerce in Venice. He notes that its location and the ability to ship goods in and out of the area made Venice an ideal trade hub in the Mediterranean. For several centuries, the Venetian Republic was the commercial center of Europe, attracting international traders from all corners of the world (UNESCO, 2018). Venice's immense trade empire was supplemented by the Arsenale, a public shipyard in Venice that constructed state-owned trade ships optimized for commerce and use in the conditions of the Mediterranean Sea. Maddison explains that the immense wealth of the Venetian Republic attracted goldsmiths, architects, woodcarvers, and decorative artists, who turned the churches, monuments, and other structures of Venice into beautiful works of art. The leading role of the Republic of Venice in European trade began to be challenged in the 16th century by globalization and growing competition, and

the fall of the Republic in the 17th century signaled the end of its reign of trade commerce. Although Venice fell out of its dominant position in international trade, its social and cultural elements were retained. Foreigners who once visited Venice for business and trade now viewed the city as a symbol of freedom and cultural prosperity. Thus, the city's role as a tourist destination took root quite early, offering breathtaking architecture, rich culture, beautiful art, and lavish entertainment for worldwide visitors. Venice invested heavily into the entertainment industry, signifying its shift in interests from international trade, maritime power, and commerce, to consumption, entertainment, and leisure. The shift of focus to local businesses catering towards tourism is a theme that holds true to the present day.
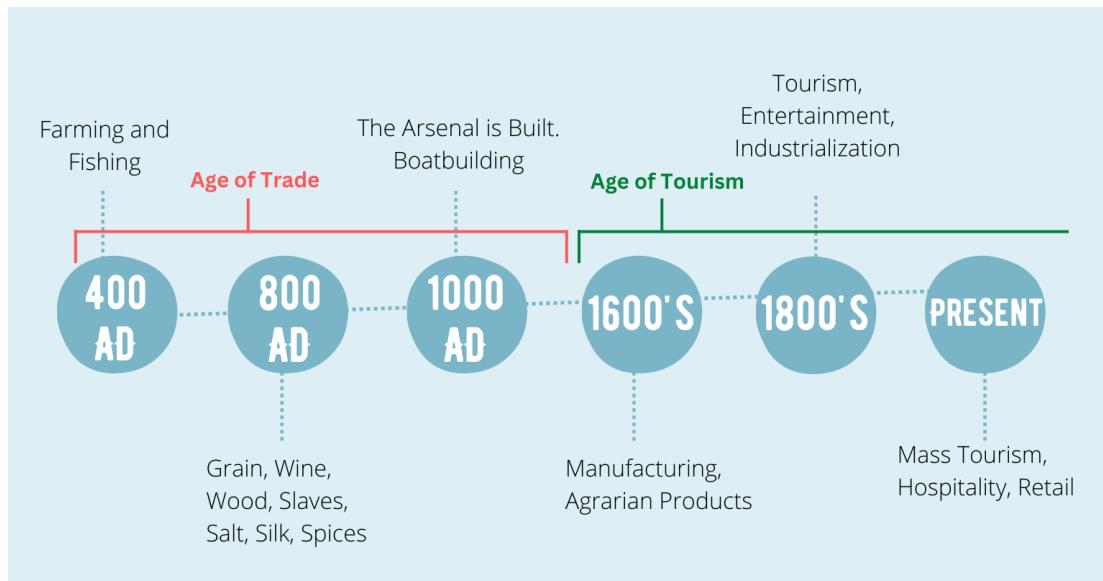

Figure 1. Major Sectors and Developments of Commerce In Venice

Tourism continues to be the most prosperous industry in Venice, with over 30 million visitors contributing more than 1.5 billion euros each year (Og, 2018). Among the contributing sectors to tourism are the HORECA and retail sectors. HORECA, which stands for Hotels, Restaurants, and Catering, includes lodging, travel, food and drink, and entertainment businesses. The retail sector encompasses businesses specializing in the sale of goods or services, including businesses related to jewelry, apparel, groceries, tools and equipment, pharmaceuticals, and much more. Together, the HORECA and retail sectors contribute to more than 41.3% of Venice's GDP (Chamber of Commerce, 2021), a measure of a region's economic output. Tourist sectors of commerce, retail, and hospitality also dominate the job market, comprising over 55% of Venice's jobs, as shown in **Figure 2**.
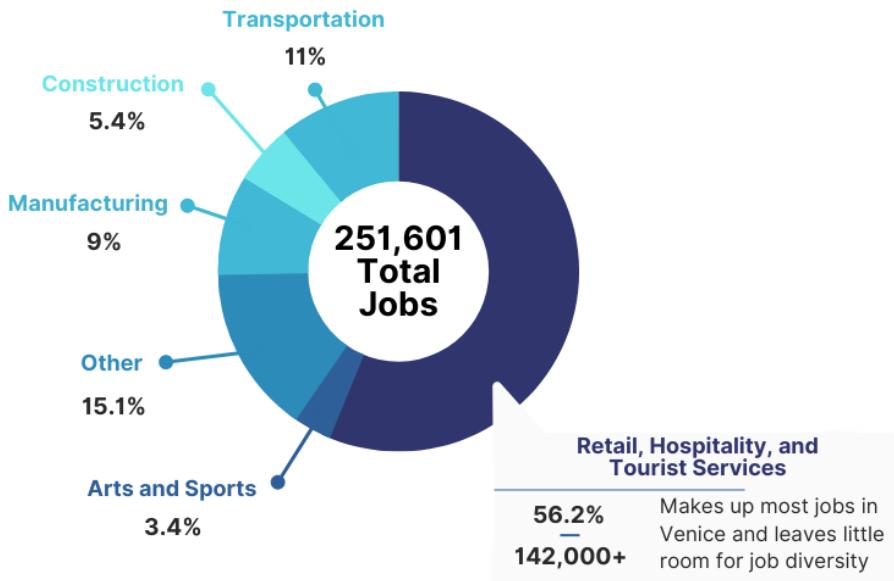
Figure 2. The Distribution of Venice jobs across sectors in 2019 (Adapted From SMDST 2019)

With Venice being one of the most visited cities in the world (Asero & Skonieczny, 2017), it is apparent that the local economy is dominated by tourism. However, as the number of tourists continues to climb at an average of 3.6% annually since 2004 (Og, 2018), many classic Venetian stores are closing and replaced with general tourist-oriented stores. With this pattern, tourism is often blamed for store closures. While this could be a factor, other causes may also contribute to store turnovers and closures. Another factor could be the declining population of Venice, which fell below 50,000 residents in August of 2022 from a high of 175,000 residents in 1951 (Giuffrida, 2022). The customer base for shops with resident-related goods and services is disappearing. It is difficult to credibly pinpoint factors without a full set of data examining shops in Venice over time. To create a baseline for such an analysis, **our project used mobile technologies to conduct a full inventory of all the shops in Venice.** This project supported the work of the SmartDest project, a research initiative investigating the impact of tourism on commerce, housing, and mobility, and how these factors in turn affect locals. Our sponsoring organization was SerenDPT, a Venetian non-profit organization partnering on the SmartDest research initiative and striving to repopulate Venice by creating more jobs and startups in the city along with The Venice Project Center (VPC), which has been researching Venetian assets for over 34 years.

Part of the VPC's student research since 2004 has focused on inventorying and finding trends in the evolution of Venice shops and hospitality businesses. In 10 different years, these teams directly observed shops in various sections of the city, recording shop names, locations, and types. Over the last several periods of data collection, student researchers at the VPC had also developed a mobile app to improve the efficiency of data collection, feeding this data into a repository website where users can filter the data by shop type, year, location, and store status

(open/closed), producing visualizations that display trends (Azaro, 2021). Although this method was a breakthrough and the teams had inventoried partial data for the city during 10 periods since 2004, by the start of this project, a complete inventory of the entire city had not yet been done. The app itself needed to be streamlined, and the data repository needed some updating as some of the data had been flagged for verification. This was the context in which we began our work, the focus of which was to address four questions:

- How many shops are there in Venice?
- How many shops of each type are there in Venice?
- Who are the target customers for these shops?
- How have shops changed over time?

Data Collection

In order to conduct a complete inventory on the retail and hospitality shops in Venice, we used an updated version of our mobile application, highlighted in **Figure 3**, directly observing every address in the Historic city to identify and record information on each shop we observed.
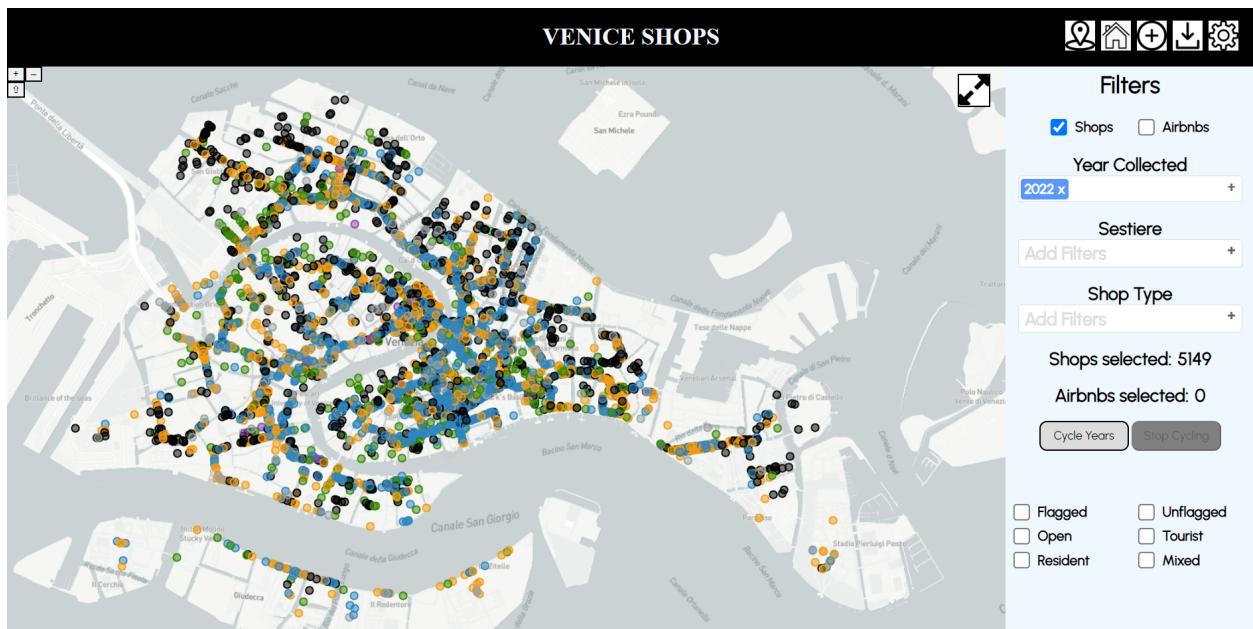

Figure 3. The Venice Shops Application used to Collect and Visualize Data

Venice's sequential address system, where addresses are organized by sestiere rather than street, was utilized to efficiently collect data. At each address with a store, the shop name, location, type, and a picture was collected.

While the Italian government categorizes retail into 43 types, the VPC's research projects on city shops have classified shops into 122 distinct types as a way to do a more fine grained analysis. **Figure 4** provides a partial breakdown of the way we categorized shops. After 5 weeks, we were able to record all shops in the historic city. A breakdown of all categories and types can be found in **Appendix A**.
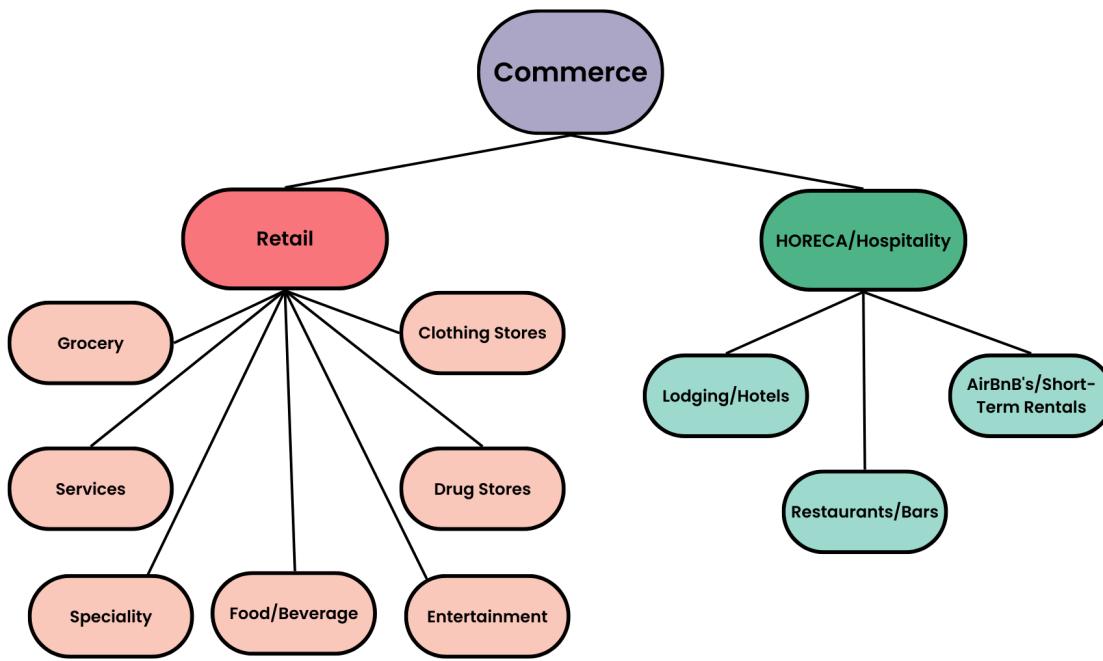

Figure 4. Major categories for identifying types of shops.

Trends in Venetian Commerce

Upon the verification of previous data and collection of current data we were able to compare the limited data collected on shops in previous years to explore emerging trends or changes in Venetian commerce. We report our results in the following sections.

How many shops are there in Venice?

Of the 32,403 addresses in the historic city of Venice in 2022, we found that 5,149, or 16%, were storefronts. Of these, 3843 stores were open and 1293 were closed. While this number may seem high, many of these storefronts have been closed for long periods of time. Some seem to have been abandoned and in dilapidated condition or completely walled in by brick and concrete. Other closed stores have been converted into housing (**Figure 5**)., especially in areas further away from main streets and tourist areas.

Figure 5. Location of Closed Stores

How many shops of each type are there in Venice?

We labeled each shop by its respective type (**Figure 6**). The distribution of shop types closely follows Pareto's Principle, which states that for many events, 80% of the effects come from 20% of the causes. In this context, we found that the most common types of shops fell into only 24 categories, accounting for 76% of the total number of shops.
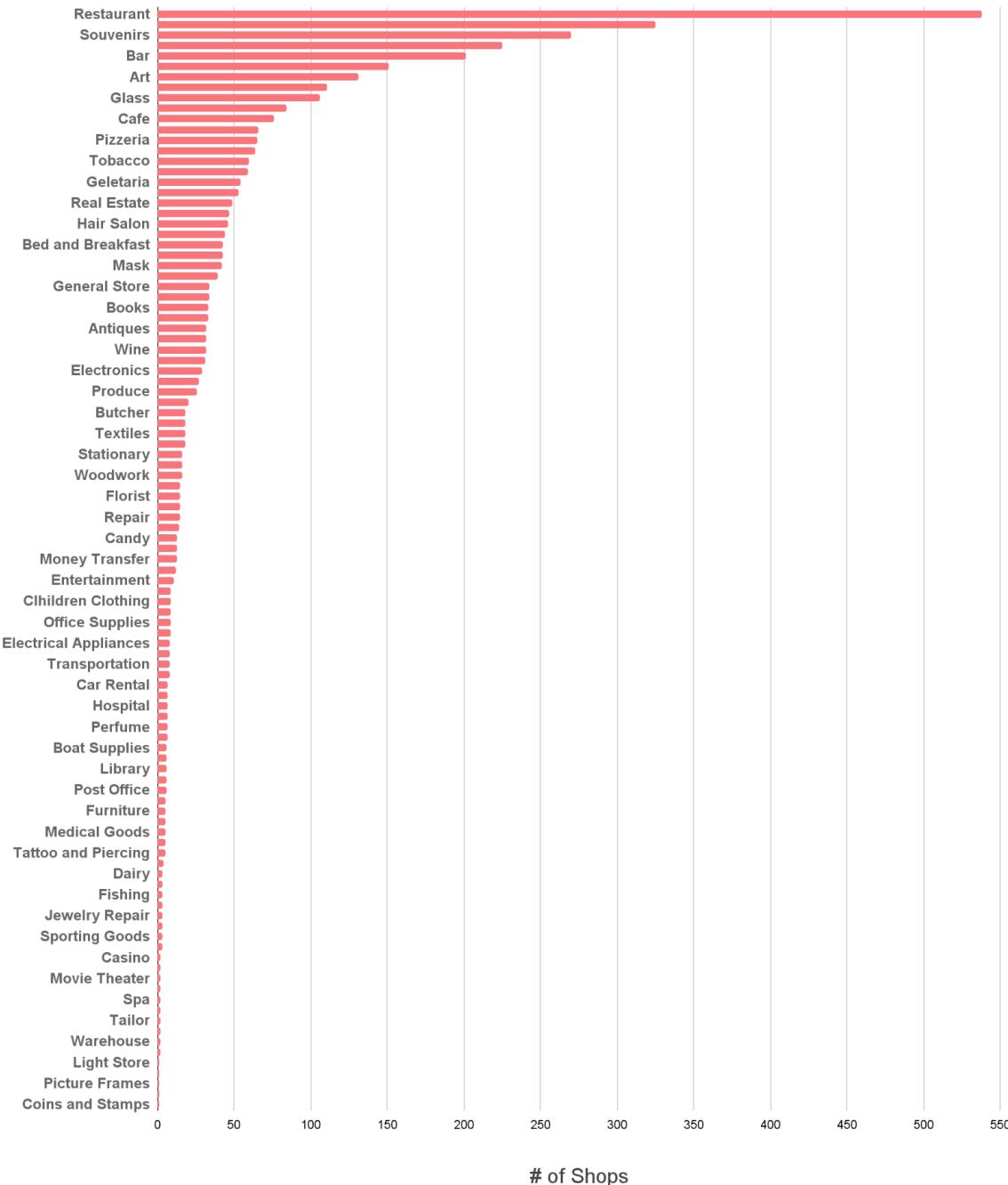
Figure 6. 2022 Quantity of Different Shop Types in the City

There are 2639 shops in these 24 categories (**Figure 7**). The most common store type in 2022 was restaurants; 538 restaurants accounted for 10.5% of all stores in the city. This was followed by souvenir shops, bars, hotels, and jewelry stores. We will explore how stores cater to target customers in a later section, but these most common shop types seem to cater mostly to tourists, and are found primarily on main roads, although these shops can be found all over the city.
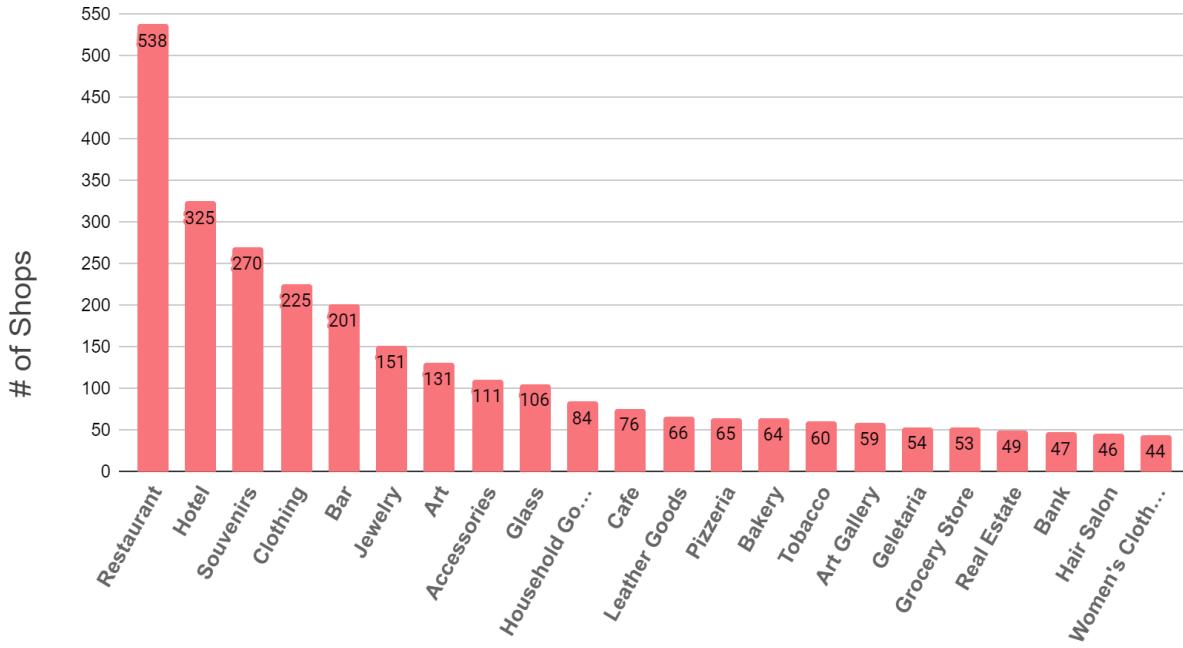
Figure 7. 2022 Top 20% of Shop Types in the City

Conversely, when looking at the tail end of the graph, we see that six types of shops only had one or fewer stores, shown in **Figure 8**. Many of these businesses seem to be resident oriented. As such, residents that require these products and services may have to travel longer distances to reach them. The small number of stores also lack variety, and as such the only option to meet their needs is to travel to the mainland. In what follows we cover more on our observations of resident-oriented businesses.

Store Type	Number of Stores
Light store	1
Music	1
Picture Frames	1
Printing	1
Coins and Stamps	1

Figure 8. Shop Types With One or Fewer Stores

Who are the target customers for these shops?

An existing feature on the application automatically categorizes shop types by whether they cater to tourists, residents, or a mixture of both. This allows for further analysis. Utilizing this feature, we found that of the 3844 open shops, 904, or nearly a quarter, were tourist-oriented, 501 (13%) were resident-oriented, and the majority, 2436, were categorized as mixed (**Figure 9**). According to this coding system, there are almost two times as many tourist shops as resident shops in 2022; however, many of the shop types automatically labeled as mixed (because they theoretically offered goods or services both tourists and residents might use) could be labeled in a more complex way on a case by case basis, to indicate whether they primarily serve residents or tourists.
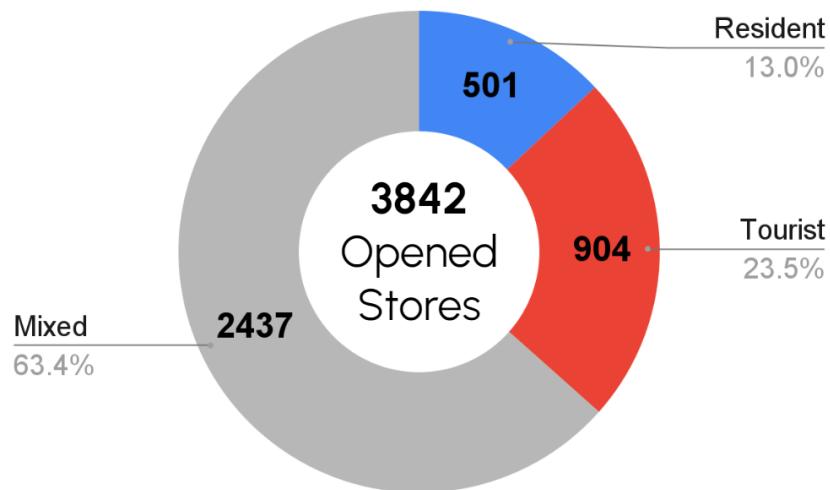

Figure 9. Comparison Between Resident, Tourist, and Mixed Shops

For example, many restaurants with visuals of their food and multilingual menus seemed oriented more to tourists than residents. As such, the current coding system seems limited; in particular, it may under-represent the number of shops catering either wholly or primarily to tourists. We recommend future teams use a sliding scale or apply a greater number of coding categories, and that they do so for each individual store, based on their best judgement. These updates, as shown in **Figure 10**, will allow for future detailed analyses.
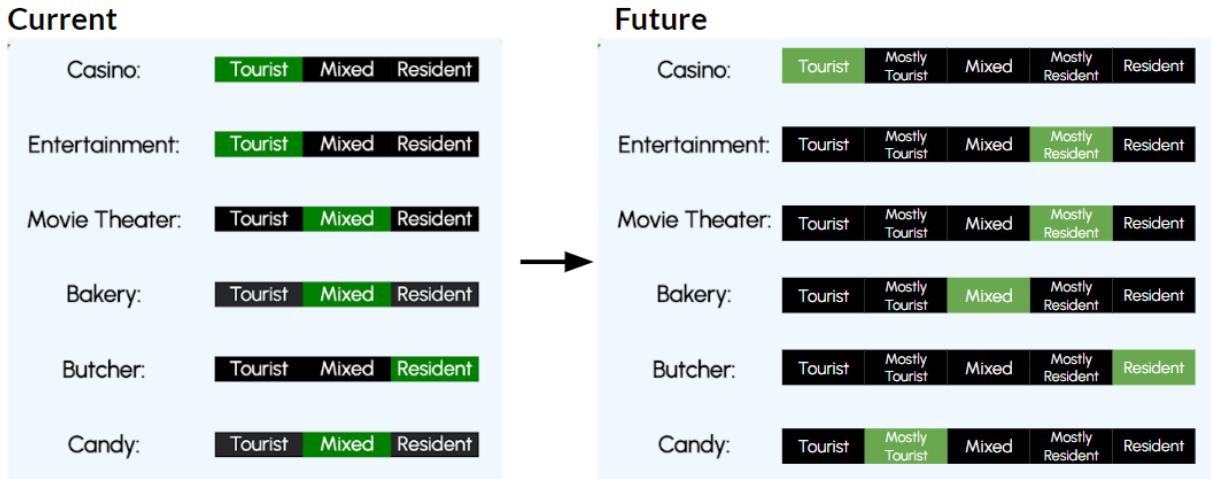
Figure 10. Recommended Customer Categorization Features for Future Iterations of the App

How have shops changed over time?

In analyzing how shops have changed over time in Venice, we looked at past shop data collected by prior WPI project teams. Most of the analysis is based on data collected 2004, as this data set had a *mostly* complete inventory of shops across the city, however we only compared shops in the past to present shops if we had data for each.

When looking at the 2681 comparable data points from 2004 and 2022, we noted that many stores changed from closed to open. Of the 125 stores that reopened since 2004, 22 changed into restaurants, 11 changed to souvenir shops, and 9 turned to art shops. Thus, we saw some shift towards tourists as customers. This is not a new trend; As seen in **Figure 11**, the five most frequent shop types in both 2004 and 2022 consisted of shops catering towards the tourist and mixed categories. The number of shops in tourist-oriented businesses is also increasing, as indicated by **Figure 11**. Many of these newer shops have been opening in more tourist-populated areas, such as the San Giacometo area near Rialto and the Ormesini Canal near Strada Nuova.
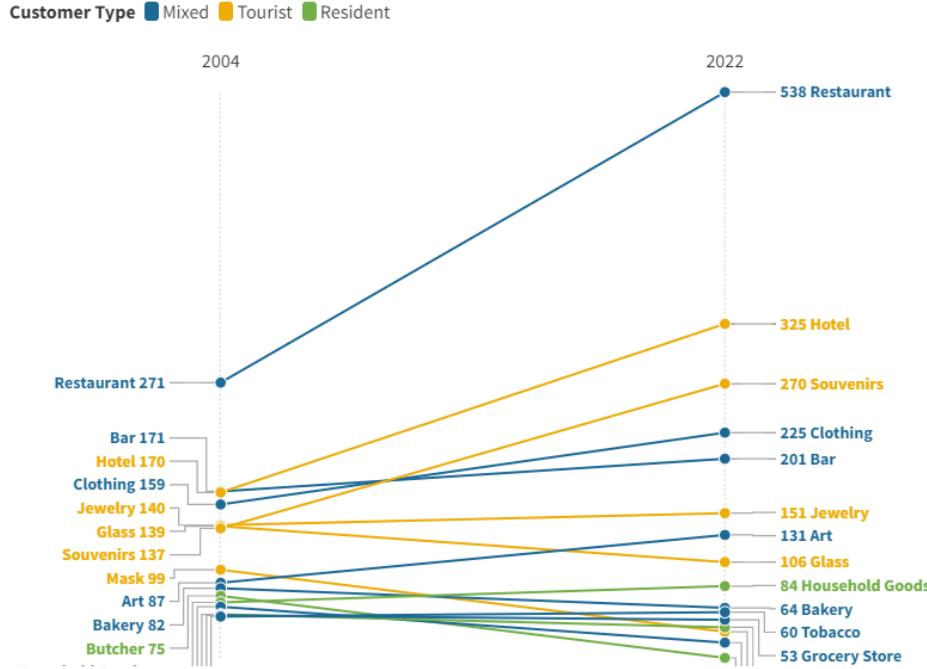
Figure 11. Top Shop Types in 2004 and 2022

Restaurants increased most in the past 18 years, from 271 recorded businesses in 2004 to 538 in 2022. Many of these new restaurants in 2022 were previously other types of businesses in 2004, as noted in **Figure 12.** The majority of new restaurants opened at a storefront that was previously closed. Additionally, most of the other storefronts used to exist as a resident catering business, or at least at a mix. Similar patterns can be seen with souvenir shops, which increased from 137 locations in 2004 to 270 in 2022. This shows that tourist shops are replacing resident shops in Venice.

Type	Closed	Grocery Store	Bakery	Cafe	Cosmetics	Wine	Clothing	Souvenirs	Antiques	Bank	Hardware	Hotel	Travel Agency	Books	Butcher	Electronics	Exchange	Florist	Furniture	Glass	Hair Salon	Household Goods	Laundromat	Leather Goods	Mask	Pet Store	Photo Store	Photo Copy	Real Estate	Shoes
Number	22	5	4	4	4	4	3	3	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Figure 13. Number of Shop Types in 2004 that had changed to Restaurants by 2022

It is interesting to note the trend of grocery and general stores in Venice. As a type of business that primarily caters towards residential customers, one might assume that the number of stores would decrease. However, the number of general and grocery stores increased from 60 locations in 2004 to 88 locations in 2022. A possible reason for this increase is the rising popularity of short-term tourist rentals equipped with kitchens. In **Figure 14**, 2013 AirBNB data and the locations of general and grocery stores is compared to the same data from 2022 in an

area around the Rialto Bridge. With the large increase of AirBNBs in 2022 came an increase of grocery and general stores. Although the residential population decreased in this time period, such stores had a growing customer base of tourists using AirBNBs and other short-term rentals.
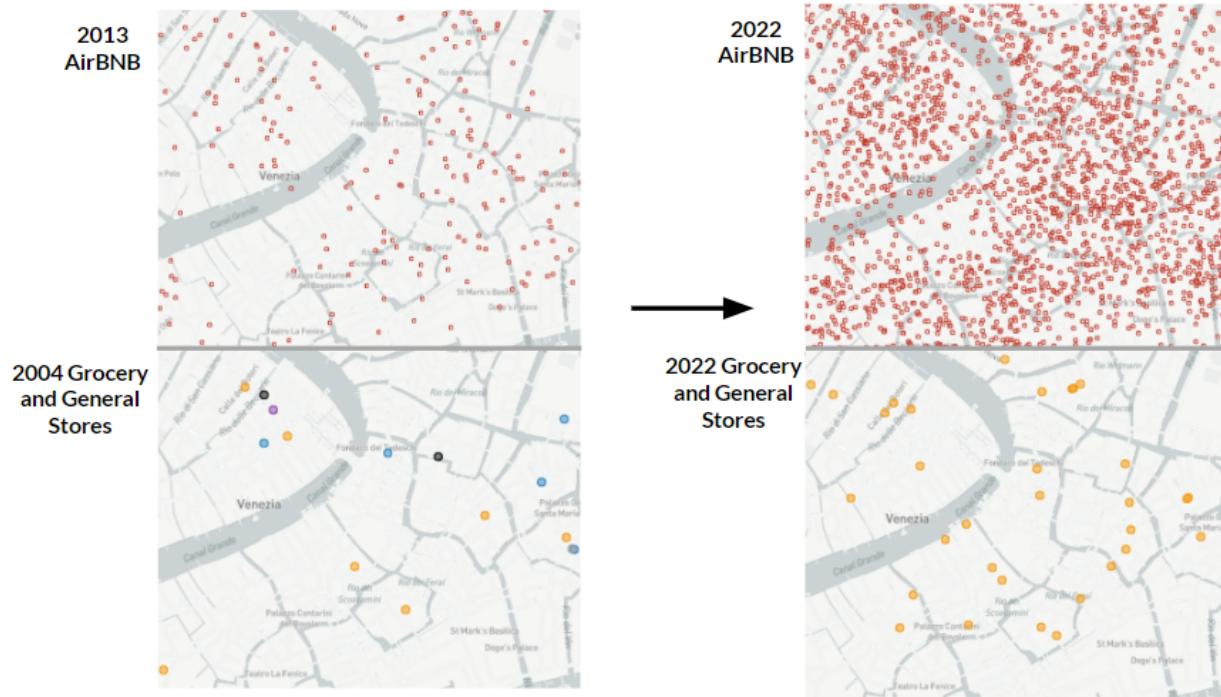

Figure 14. Current Grocery and General Stores Compared to 2013 AirBNBs, 2004 and 2022

Aside from grocery stories, there seems to be a decrease in other types of resident-oriented businesses, which can be seen by comparing data from 2004 and 2022. For example, the number of produce stores in Venice decreased by 14, 10 of which turned into tourist-oriented stores. When looking at all store types that only had one store in 2022 and comparing these to the same types of shops in 2004, we found that all of them had decreased markedly over the past 18 years as shown in **Figure 15**. These shop types may be in danger of disappearing from the historic city. Many of these necessary shops could be needed for much of the elderly population of Venice, who would need to travel across several bridges and islands to reach a store. As an example, one of the last cobblers of Venice recently announced its closure after being open for decades (Gasparon, 2022). At a similar time, another announced its opening, which shows there may be hope for some resident-oriented shop types with no competition to fill the gap. While the incentive of no competition may guarantee some shop types' existence in Venice, it is difficult to say for certain whether shops may fully disappear from the historic city.
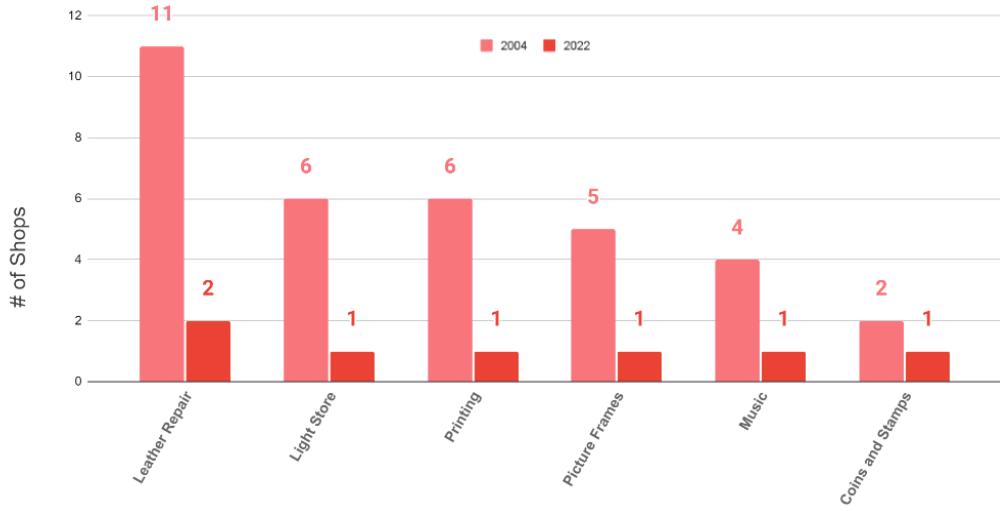
Figure 15. Number of Currently Scarce Shops as Compared to Their Numbers in 2004

In an effort to further share results, our team created a repository website to house our analyses and all other resources related to VPC commerce projects. This repository serves as an organized central location for all VPC projects to store sources, papers, visuals, and other resources used. On this site, viewers can find presentations on this research, links to our team website, all references used, and other useful graphics produced from this data collection. This repository, as seen in **Figure 16**, will aid future projects in expanding project data and analyses, and will also help site visitors find information in a simple and organized website.

Figure 16. The Commerce Repository Website

Recommendations and Conclusions

From renowned trading hub to profound tourist attraction, Venice has always adapted its commerce to the times. In collecting data on all shops in Venice, we confirmed that many of its shops and businesses are shifting towards goods and services that serve a growing tourist customer base, while many resident oriented stores are disappearing, along with the local population In the case of a resident, acquiring necessities may require travel across many canals and islands. There may not be a great variety of goods and services to choose from, and in some cases, residents may need to travel to the mainland to find what they need. Yet, there is still a customer base in the city, and enterprising businesses may jump in to fill gaps when certain types of stores disappear entirely. But the question remains: If more Venetians leave, will this contribute to the demise of resident-oriented shops? If there is no customer base, and if at the same time new opportunities for profitable tourist businesses come available instead, what will happen to resident-oriented businesses? Since shifts in businesses may happen in response to an ever shifting customer base, number of competitors, and other contextual factors, like the COVID-19 pandemic, it is difficult to predict where commerce may go next. Changes in the number of grocery stores (first declining, then later increasing with new AirBNB businesses) shows what could be a pendulum-like shift in commerce and that it may be difficult to predict exactly how tourism, itself evolving, may affect the rise and fall of store types in Venice.

We now have complete inventory of shops –insofar as we were able to conduct an accurate count based on direct observation. Although there certainly are some limitations in our analysis, Having this 2022 baseline will be critical for future researchers. As future researchers continue to explore the shifting nature of commerce over time, investigating how local migration and changes in tourism may drive some of these changes. We recommend several modifications to our methodology that might aid in this complex analysis. Many of our analyses were limited due to broad type categorization or minimal analytical features on the Venice Shops application. Shop type categories should be revisited to ensure a correct and adequate amount of types are being utilized. As mentioned earlier, we recommend increasing the scale of customer categorization features by adding "Mostly Tourist" and "Mostly Resident" categories, in addition to allowing individual shop locations to have an independent categorization within their category. Information or statistics from the Chamber of Commerce or other national data sources may prove useful, such as information on shop owners, that could strengthen future analyses. The application should also have analytical features, such as an option to layer shop locations collected in a range of years. Additional technical recommendations can be found in the [Technical Addendum](#). These changes will help to strengthen future commerce analyses.

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Appendix A: Shop Type Super-Categories

Clothing Stores:
Clothing, Costumes, Children's Clothing, Gloves, Men's Clothing, Shoes, Undergarments, Women's Clothing

Drug Stores:
Cosmetics, Medical Goods, Pharmacy

Entertainment:
Casino, Entertainment, Movie Theater

Food and Beverage:
Bakery, Butcher, Candy, Coffee, Dairy, Gelateria, Liquor, Produce, Seafood, Wine
Grocery Stores & Supermarkets: General Store, Grocery Store

Lodging:
Bed and Breakfast, Guest Houses, Hotel, Hotel with Restaurant, Hostel

Restaurants & Bars:
Bar, Cafe, Fast Food, Pizzeria, Restaurant

Services:
Apartment Rental, Bank, Barber, Car Rental, Computer Services, Delivery, Dry Cleaner, Electronics Repair, Film Studio, Fitness, Funeral Services, Graphic Design, Hair Salon, Hospital, Jewelry Repair, Laundromat, Leather Repair, Library, Masseuse, Money Transfer, Nail Salon, Perfume, Photo Store, Photocopy, Photographer, Post Office, Printing, Real Estate, Repair, Spa, Study Agency, Swim, Tailor, Tattoo and Piercing, Transportation, Travel Agency, Veterinarian, Warehouse, Wedding

Specialty Stores:
Accessories, Antiques, Art, Art Gallery, Boat Supplies, Books, Coins and Stamps, Computer, Electrical Appliances, Electronics, Exchange, Eyewear, Fishing, Florist, Furniture, Glass, Hardware, Household Goods, Jewelry, Knives, Leather Goods, Light Store, Luxury, Mask, Metal Work, Music, Musical Instruments, Newspaper, Office Supplies, Pawn Shop, Pet Store, Picture Frames, Souvenirs, Sporting Goods, Stationery, Tobacco, Textiles, Toys, Woodwork, Other Retail

Other:
Closed, Undefined, Radio and Television, Stall