

MGS 687LEC: Experiential IT Projects

Third Estate Analytics: Acre Hub

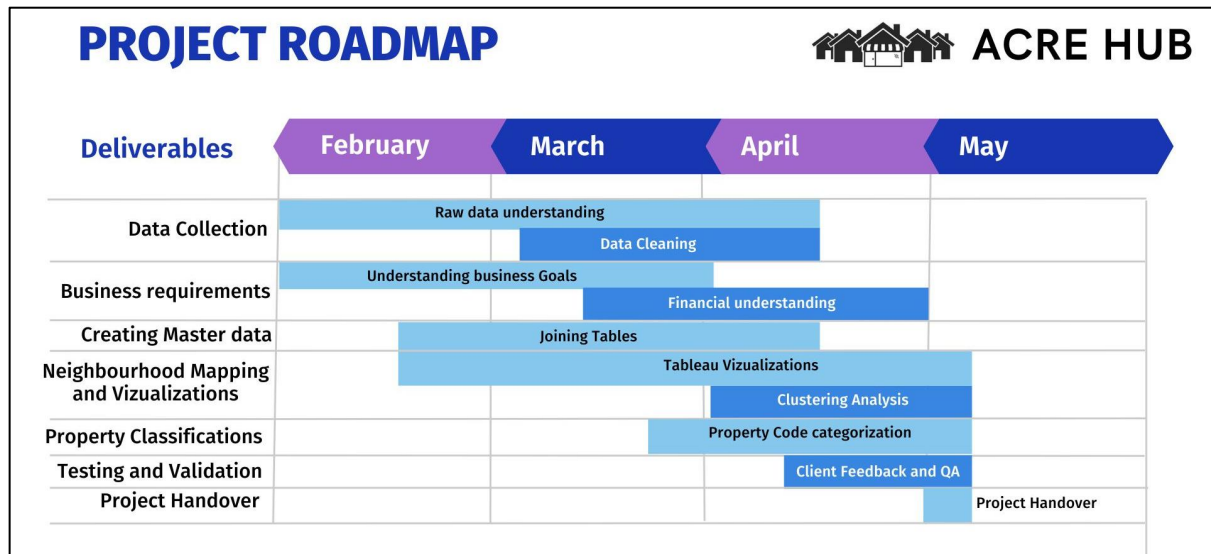
Project Overview:

Third Estate, a leading real estate analytics consultancy, is conducting a graduate consulting project to analyze Buffalo, New York's real estate landscape. This comprehensive endeavor involves studying historic landmarks, Analyzing 311 calls for code violations, examining housing court cases, and identifying zombie homes. By leveraging rigorous research, data analysis, and innovative mapping techniques, the project aims to provide actionable insights for stakeholders, including local authorities, developers, and community organizations. This initiative addresses critical challenges in housing, code enforcement, and community development, contributing to informed decision-making and sustainable urban revitalization in Buffalo.

Problem Statement

The preservation and maintenance of historic buildings pose significant challenges due to factors such as aging infrastructure, financial constraints, and regulatory requirements. The client seeks to determine the most effective way to invest in the stability of historic buildings with the aim of preserving cultural heritage while ensuring long-term sustainability.

Project Roadmap:



Scope of the Problem:

1. Historic Landmarks Preservation:

- Many of Buffalo's historic landmarks are at risk due to neglect, lack of funding, and insufficient preservation efforts
- Without a thorough understanding of their historical significance and current state, these landmarks face the risk of deterioration or loss

2. Code Violations and Housing Challenges:

- 311 calls for code violations highlight persistent issues such as blight, property neglect, and safety concerns within neighborhoods
- Housing court cases reflect a range of disputes and challenges, including landlord-tenant conflicts, property maintenance issues, and housing affordability concerns

3. Prospected Community Uplift Value:

- Identify prospects to sustainably invest and raise the overall property value, thereby increasing the overall block value

Importance of Addressing the Problem:

1. Community Well-Being:

- Preserving historic landmarks and addressing housing challenges are integral to fostering a sense of pride, identity, and belonging within communities
- Ensuring safe, affordable housing and vibrant neighborhoods enhances quality of life and social cohesion

2. Economic Development:

- A thriving real estate market, characterized by well-preserved landmarks and sustainable housing options, attracts investment, tourism, and economic development opportunities
- Addressing blight and revitalizing neighborhoods can spur economic growth, job creation, and property value appreciation

3. Equity and Social Justice:

- Addressing disparities in housing quality, access, and affordability is essential for promoting equity and social justice within Buffalo's diverse communities
- By addressing systemic issues and providing equitable access to housing and resources, stakeholders can work towards building a more inclusive and resilient city

Proposed Solution:

Our proposed solution involves:

- Creating a centralized data source integrating relevant data sources and refining it based on client requirements
- Developing a property risk system to prioritize investment based on mortgage status, property values, and other factors

Expected Outcome:

We aim to deliver a comprehensive property portfolio for investing in historic building stability that aligns with the client's goals of preserving cultural heritage while maximizing the impact of available resources.

Key Objectives:

- Gain a deeper understanding of Buffalo's historical landmarks and cultural heritage
- Analyze patterns and trends in 311 calls, code violations, and housing court cases
- Develop custom maps and visualizations to communicate findings and inform decision-making
- Provide stakeholders with actionable recommendations to address identified challenges and capitalize on opportunities for positive change

Challenges:

- The primary challenge was to gather business requirements and convert them into technical requirements
- Another challenge we faced was handling a massive amount of data with limited resources
- Integrating LLMs into the data pipeline to generate a risk score for a prospected property

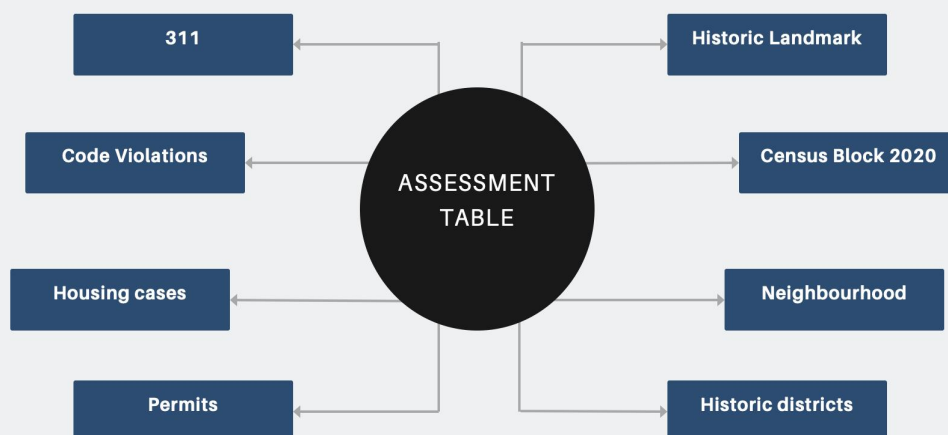
Master Table Creation and Update:

- Remove unnecessary attributes from the master table
- Visualize polygons and other data from Historic districts using Census maps and integrate them into the master table
- Curate a list of property prospects based on the client's requirements
- Utilize data from various tables (311, Code Violations, Permits, Housing Code) to identify patterns and clusters within historic districts using machine learning
- Create a risk system to identify investment opportunities

Main Table: Assessment Table

Table Name	Joined Table	Join Key
Assessment	311	Print Key-Property ID
Assessment	Code Violations	SBL
Assessment	Housing cases	Address
Assessment	Permits	SBL
Assessment	Historic Landmark	SBL
Assessment	Census Block 2020	GEOID20_Block

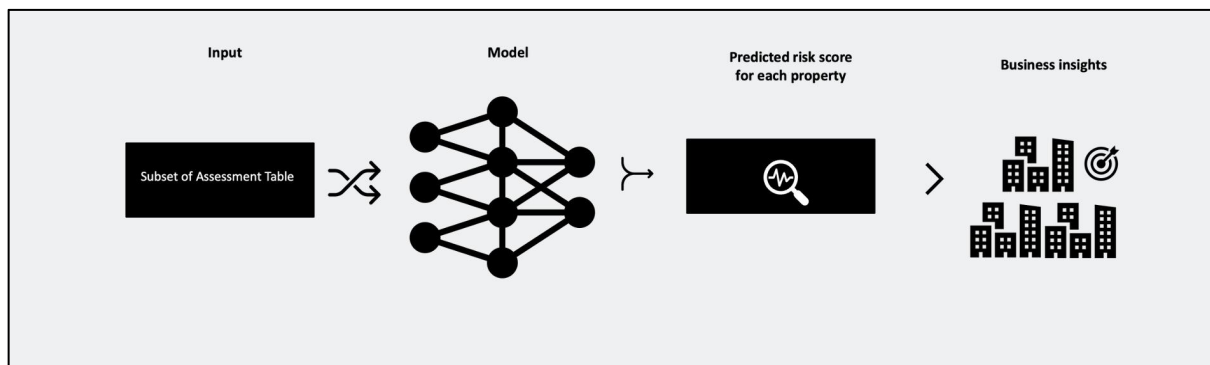
CREATION OF CENTRALIZED DATA



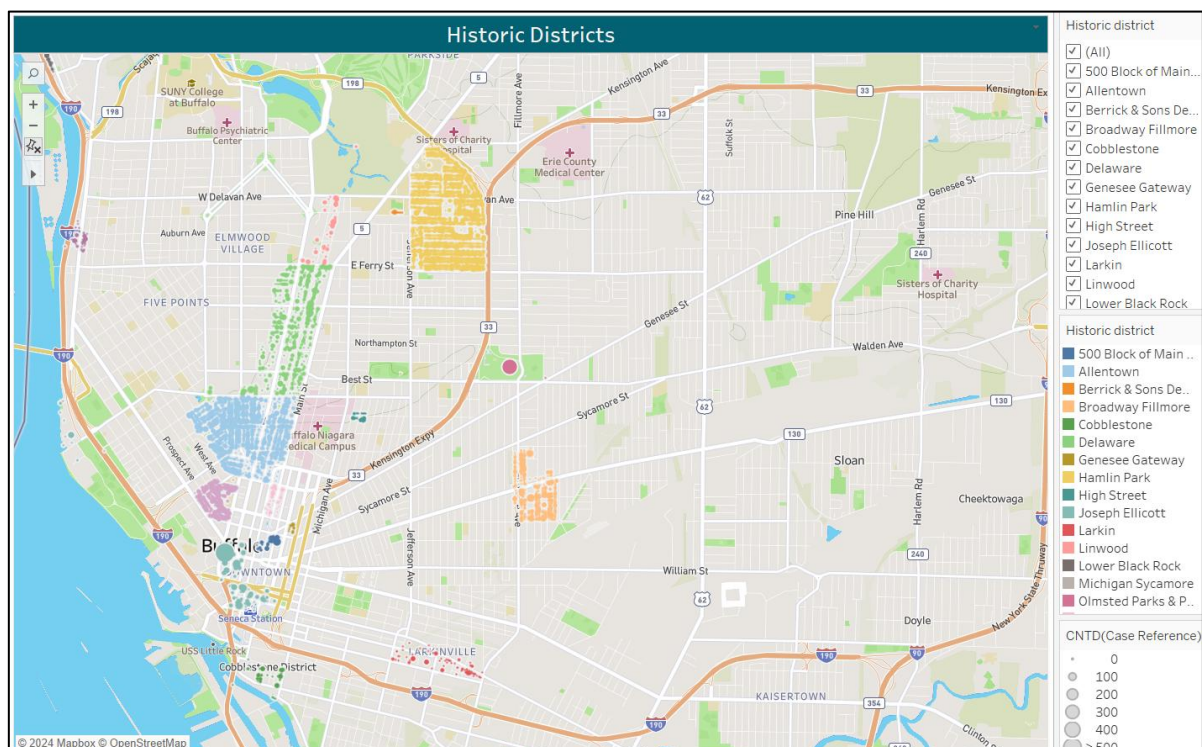
Property Risk System:

- Calculate property risk based on factors like mortgage, code violation cases, etc
- Calculate risk based on the weight assigned to each relevant attribute
- Integrate the risk score into the centralized data source

Our Approach:



Identified Prospects:



Tool:

[Click here for GitHub repo](#)

Steps to Use the Tool:

Step 1: Export the Selected Data into a CSV with the selected attributes.

Step 2: Open the Jupyter Notebook and load the CSV file in the same folder.

Step 3: Run the code. The output will be a CSV file containing the PrintKey and the associated risk score.

Step 4: Load the output CSV into Tableau and integrate it with the primary data source

Data Sources:

- Open data buffalo - <https://data.buffalony.gov/>
- 311 - <https://data.buffalony.gov/Quality-of-Life/311-Service-Requests/whkc-e5vr>
- Code Violations - <https://data.buffalony.gov/Quality-of-Life/Code-Violations/ivrf-k9vm>
- Permit - <https://data.buffalony.gov/Economic-Neighborhood-Development/Permits/9p2d-f3yt>
- Housing court - <https://data.buffalony.gov/Quality-of-Life/Housing-Court-Cases/k3vq-gzry>
- Assemble table - <https://data.buffalony.gov/Government/Current-Assessment-Roll-2023-2024-/4t8s-9yih>
- Historic landmarks - Maps & Datasets - <https://data.buffalony.gov/Economic-Neighborhood-Development/Historic-Landmarks/7gs8-9tqt>
- Historic Districts – Datasets - <https://data.buffalony.gov/Economic-Neighborhood-Development/HistoricDistricts/b9i3-m63y>
- Historic Districts – Maps - <https://data.buffalony.gov/Economic-Neighborhood-Development/HistoricDistricts/vm2t-2zda>