

Fort-Portal City Property Tax Dataset Evaluation

Prepared By: Data Cities

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Introduction

Data Source:

IRAS (Integrated Revenue Assessment System)

Columns:

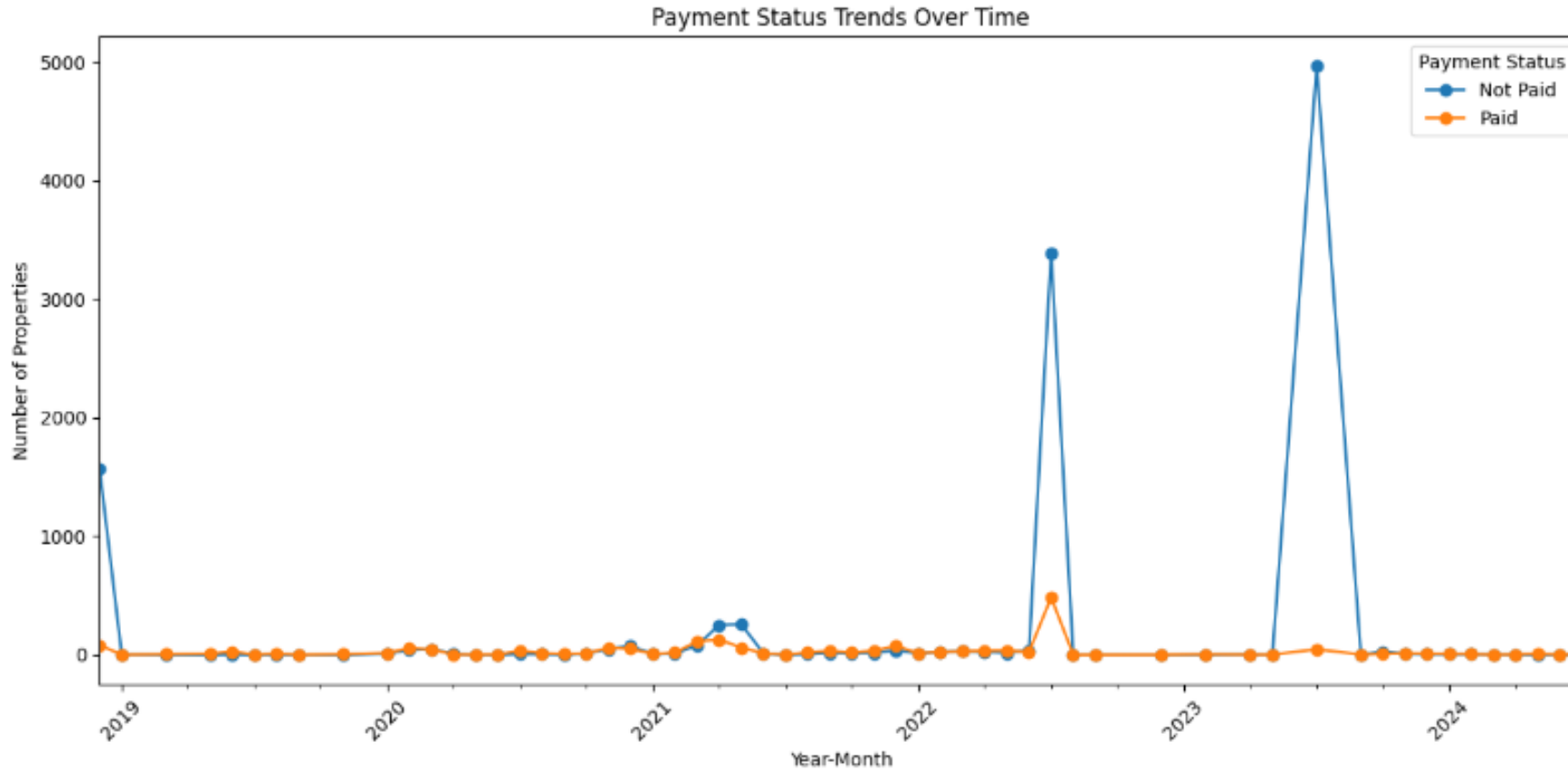
id, nin, owner_name, email, mobile_number, owner_address, street, building_name, building_number, ownership_type, property_address, purpose, purpose2, assessed_value, remarks, status, gross_value, ratable_value, annual_rate, created_by, created_at, updated_by, updated_at, municipality, division, parish, village, r_house_no, r_lat, r_lng, r_plot_no, branch_code, tin, payment_status

Motivation:

- Property tax as a Proof Of Concept on the use of AI and ML to enhance Revenue Collection in Fort-Portal City.
- Property tax is the highest contributor in the revenue streams for the city.
- However, this was not performing optimally. Thus the need for further investigation of the data.

1. Payment Status Analysis

- **Payment Status:** Categorized in "Paid," "Pending"
- **Identify Trends:** Analyzing trends over time in each category
- **Motivation:** Shows whether there are seasonal patterns or particular times when payments are more frequently paid



Explanation.

- Trends depict that arrears are not efficiently collected. The arrears burden keeps increasing with subsequent Financial Years.
- Paid assessments have always seemed steady.

2. Owner Analysis

- **Identify High-Value Properties:** Determined which properties generate the most revenue and assess their payment status.
- **Owner Engagement:**

Analyse the payment history of each property owner to identify consistent defaulters. This can guide personalized follow-up strategies.

Owners who have never paid for any property: (Excel Data Output)

payment_status	NOT PAID	PAID	total_properties
owner_name			
M.....	1	0	1
A.....RTS	1	0	1
K.....	1	0	1
K.....E	1	0	1
s.....	1	0	1
s.....	1	0	1
test	1	0	1
t.....	1	0	1
V.....	1	0	1

Top 10 Consistent Defaulters:

payment_status	NOT PAID	PAID	total_properties
owner_name			
I.....	30	2	32
I.....	28	5	33
P.....	28	0	28
I.....KET	25	0	25
I.....	20	7	27
B.....	19	4	23
C.....A	17	0	17
I.....	17	11	28
P.....	17	4	21
I.....	16	0	16

3. Property Valuation Insights

Task: Distribution of Amounts:

visualizing the distribution of amounts due.

Identify if higher amounts correlate with higher default rates.

- Visualized the distribution of gross/assessed value (using 'gross_value')
- Correlated between higher values and default rates.

Top 10 Most Highly Valued Properties

	owner_name	assessed_value	gross_value	ratable_value
0		NaN	1,872,000	2,400,000
1		NaN	3,276,000	4,200,000
2		NaN	1,923,076	1,500,000
3		NaN	1,923,076	1,500,000
4		NaN	3,846,153	3,000,000
5		NaN	1,282,051	1,000,000
6		NaN	1,282,051	1,000,000
7		NaN	1,923,076	1,500,000
8		NaN	1,282,051	1,000,000
9		NaN	1,923,076	1,500,000

Payment Status of highly Valued Properties

- Simple xls nslookup operations – Cross reference top 10 Highest valued properties
- To show the payment status of those property owners (High valued owners)

3. Time To Payment

Motivation:

- **Distribution of Amounts:** visualizing the distribution of amounts due.
- Identify if higher amounts correlate with higher default rates.

Top 10 Defaulters by Average Payment Time

	owner_name	average_payment_time	property_count
195	_____	1993	1
958	_____ Bank For	1903	1
1205	_____	1900	1
1234	_____ted)	1898	1
357	_____	1776	1
841	_____	1662	1
1161	_____	1641	1
858	_____	1639	1
144	_____	1602	1
861	_____	1573	1

Payment Status: Proportion by Property Value

Stacked Bar Chart:

The chart displays "Paid" and "Not Paid" proportions per value bin, with values shown on hover and text labels inside the bars for clear readability



4. Time to Payment

- **Average Payment Time:** Calculate the average time taken for payments post-due date. Identify which types of properties or owners take longer to pay.
- Saved under 'Longest Defaulters'

	owner_name	average_payment_time	property_count
1	Chigbenna, Chibuike	1993	1
2	Microfinance Bank (United Bank For	1903	1
3	The Late Mykenna Robert	1900	1
4	Vivika Pharmaceutical Limited	1898	1
5	SHIMMY CHRIS NKOSIA	1776	1
6	Maria Cecilia M. Vera	1662	1
7	Carah Kate	1641	1
8	Maria Elena	1639	1
9	CHRONO TOPOTA	1602	1
10	Impungo Sam	1573	1

5. Geographic Analysis

Location Patterns:

- Map payment statuses geographically to identify areas with higher default rates, to guide the development of an improved performance targeted outreach or property tax implementation adjustments in those area of the city.

Recommendation: Team needs clean data to make accurate mappings of properties and payment status.

(Sunbird)

Benefits:

- Validation of emerging properties
- Easy analysis and follow up on defaulters.
- Reduction of replicated enforcement efforts

6. Engagement Strategies

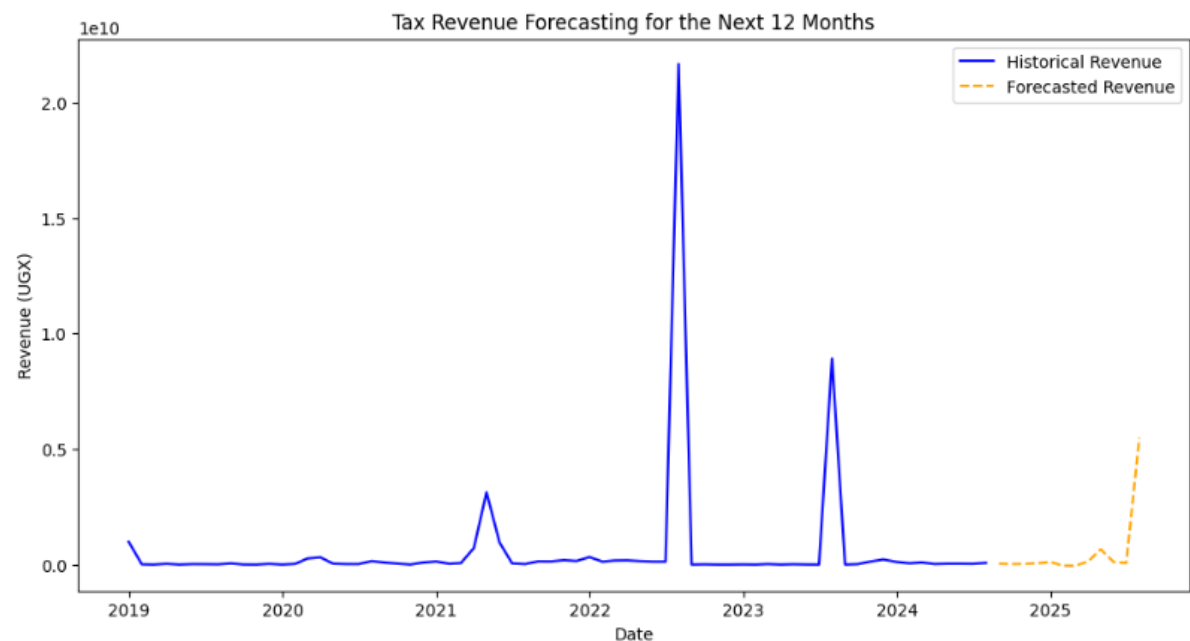
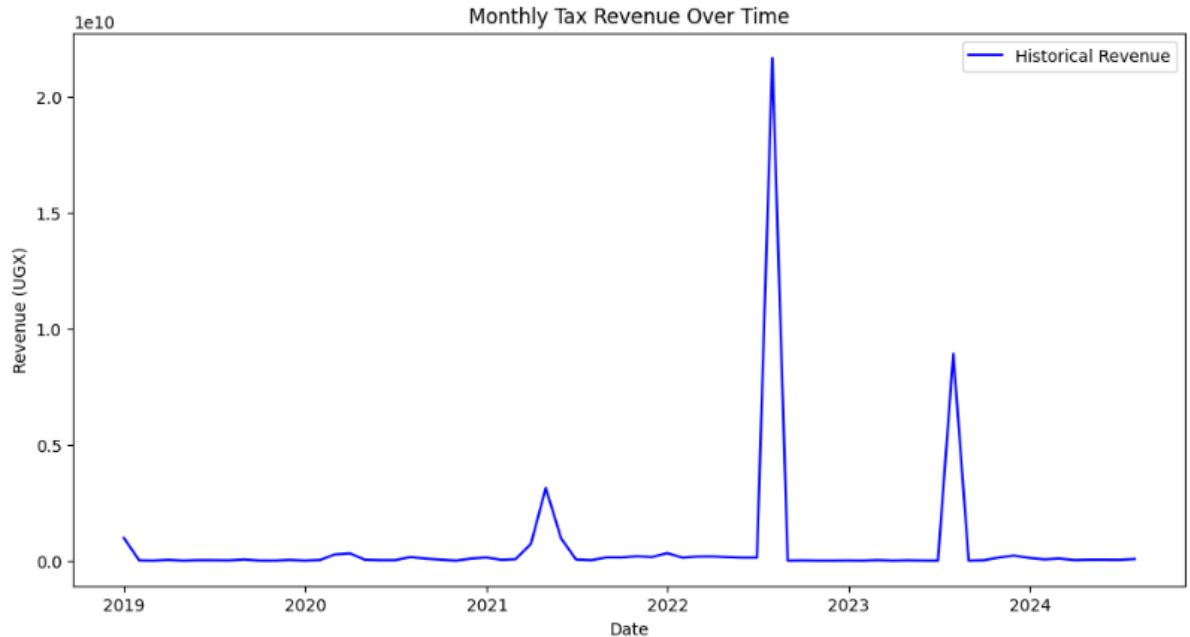
- **Tailored Communication:** Use of the analysis to segment property owners and tailor communication strategies, such as personalized reminders for high-risk categories.

Proposed solution: Incorporation of OTP verification, SMS and email remainders, Alerts on defaulters to the System Admins

(Fueless)

- **Payment Plans:** Explore and analyse the payment methodology options for flexible payment arrangements for those who consistently struggle to pay on time

7. Tax Revenue Forecasting



Date	Projection
31/08/2024	36,883,330
30/09/2024	21,040,080
31/10/2024	28,231,250
30/11/2024	53,644,660
31/12/2024	108,199,800
31/01/2025	-48,186,840
28/02/2025	-51,702,190
31/03/2025	127,221,000
30/04/2025	661,230,700
31/05/2025	108,709,400
30/06/2025	68,799,430
31/07/2025	5,494,437,000