

UAE SME Growth Analysis using Python Power BI and ML

Project Report

Business Problem

Small and Medium Enterprises (SMEs) are crucial to the UAE's economy, contributing to employment, innovation, and GDP. Despite their importance, SMEs face challenges such as high customer churn, limited diversification, dependency on traditional sales, and underutilization of digital tools.

This analysis aims to: - Measure SME revenue performance and growth trends.

- Identify factors driving customer churn and retention.
- Compare marketing spend against sales outcomes.
- Understand SME performance across industries and Emirates.
- Provide actionable strategies to improve revenue, customer loyalty, and scalability.

Exploratory Data Analysis Insights

Summary Statistics

SME Profiles:

	sme_id	emirate	industry	subindustry	employees	\
0	SME100000	dubai	manufacturing	Light Manufacturing	33	
1	SME100001	ras al khaimah	hospitality	Restaurants	47	
2	SME100002	sharjah	logistics	Courier	5	
3	SME100003	dubai	construction	Contracting	13	
4	SME100004	abu dhabi	manufacturing	Furniture	1	

	annual_revenue_aed	founded_year	license_type	trade_license_issuer	\
0	200000.0	2011	free zone	JAFZA Free Zone	
1	200000.0	2023	free zone	RAK DED	
2	200000.0	1998	free zone	DMCC Free Zone	
3	200000.0	2020	mainland	SDED (Sharjah)	
4	200000.0	2003	mainland	Ajman DED	

	owner_nationality_group	female_owned	exporter	digital_adoption_score
0	Expat	1	1	71
1	Expat	0	0	80
2	Expat	0	0	71
3	UAE National	0	0	59
4	Expat	0	0	66

KPIs:

	sme_id	month	revenue_aed	orders	online_sales_pct	\
0	SME100000	2022-01-01	26599.45	91	0.482	
1	SME100000	2022-02-01	23660.11	86	0.588	
2	SME100000	2022-03-01	21345.29	69	0.507	
3	SME100000	2022-04-01	28944.64	97	0.519	
4	SME100000	2022-05-01	33401.14	109	0.433	

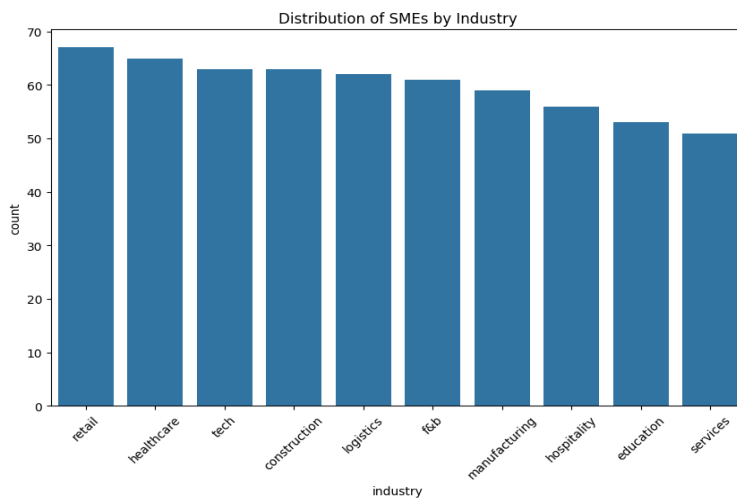
	avg_order_value	marketing_spend_aed	staff_count	new_customers	\
0	292.30	2416.76	31	56	
1	275.12	2731.61	28	52	
2	309.35	1016.23	30	42	
3	298.40	1907.35	32	45	
4	306.43	3156.75	31	63	

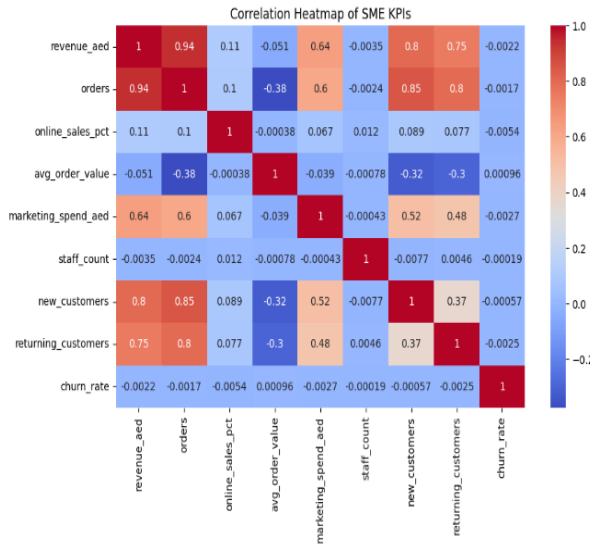
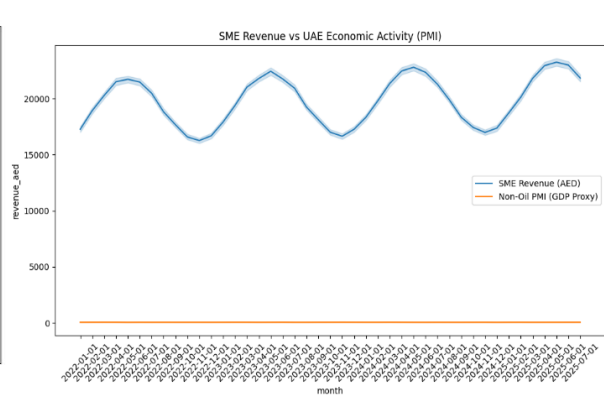
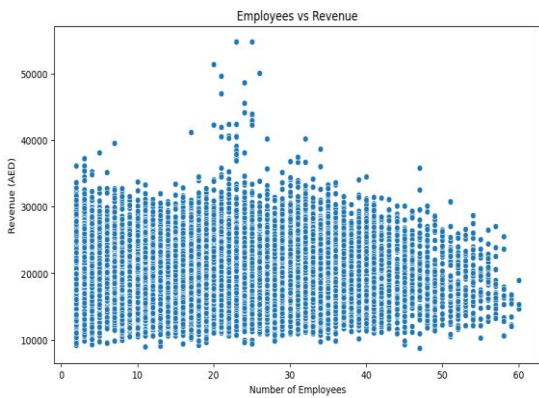
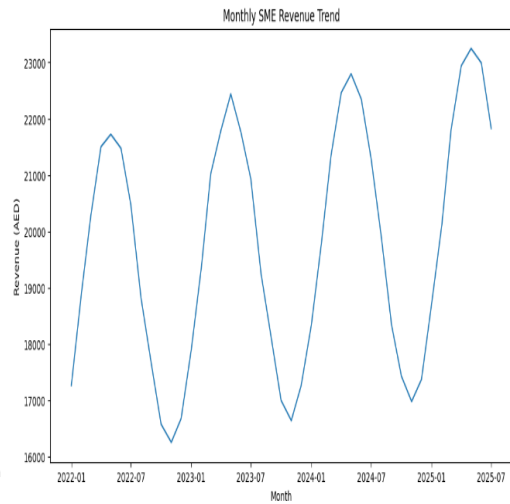
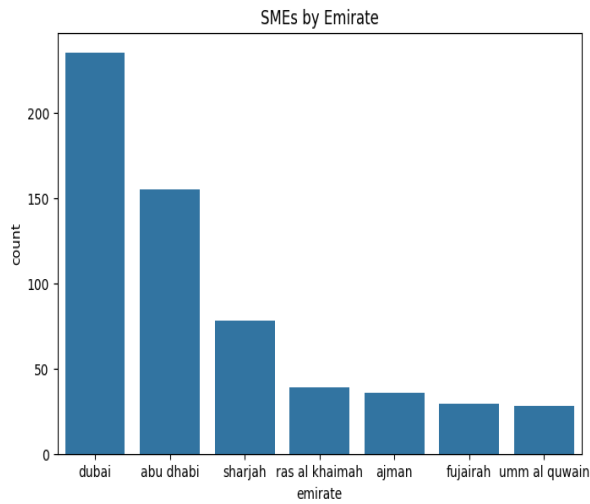
	returning_customers	churn_rate
0	35	0.022
1	34	0.110
2	27	0.068
3	52	0.080
4	46	0.081

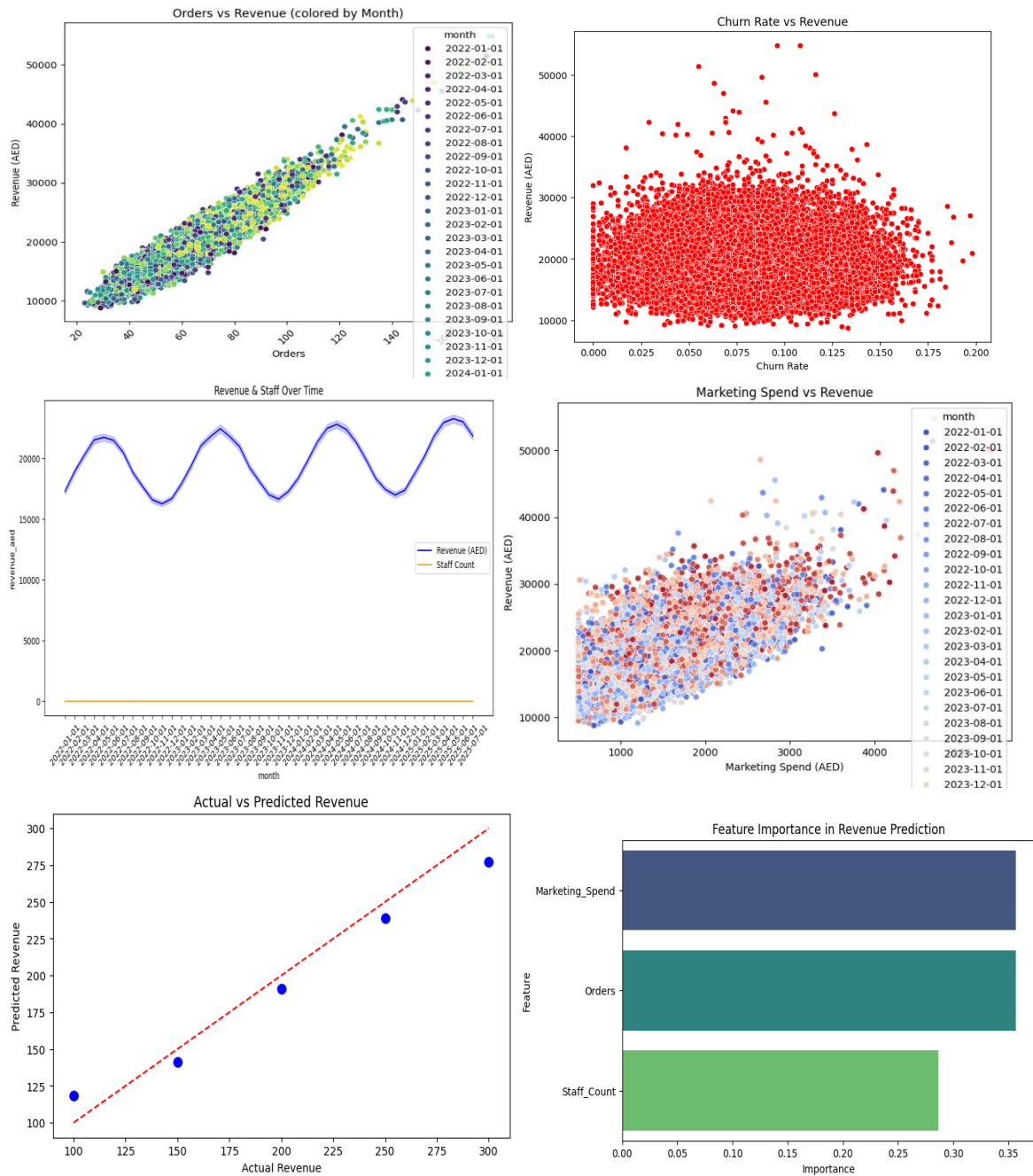
Macro Indicators:

	month	cpi_index_2021_base	non_oil_pmi	policy_rate_proxy_pct	\
0	2021-01-01	100.09	48.29	0.22	
1	2021-02-01	100.07	51.95	0.30	
2	2021-03-01	100.12	52.65	0.49	
3	2021-04-01	100.26	51.00	0.10	
4	2021-05-01	100.39	52.91	0.79	

	brent_usd_per_bbl	dubai_visitors_millions	usd_aed_fx
0	57.14	0.568	3.6725
1	59.87	0.794	3.6725
2	67.71	0.972	3.6725
3	69.52	1.001	3.6725
4	66.37	1.054	3.6725







Key Metrics from Dashboard: -

Total Revenue: \$1.12M

- Average Order Value (AOV): \$118.06

- Churn Rate: 449.1%

- New Customers: 2,124

- Revenue Trends: Revenue has remained fairly stable from 2022 to early 2024 with fluctuations, but actual revenue occasionally falls short of predicted values.

- Marketing & Sales: Marketing spend shows moderate correlation with sales, but efficiency decreases at higher spending ranges.
- Customer Segments: Returning customers account for 56.22% of total, while new customers contribute 43.78%.
- Regional Distribution: Highest contributions come from Dubai and Sharjah, while other Emirates such as Ajman and Umm Al Quwain show smaller shares.

Data Filtering

- To ensure meaningful insights, analysis focused on: -
- SMEs with consistent sales and order values. –
- Industries with significant representation: Construction, Education, F&B,, Healthcare. - Emirates with measurable revenue contributions

Correlation Insights

- Marketing Spend vs Sales: Moderate positive relationship.
- Customer Retention vs Revenue Growth: Strong correlation.
- SMEs with higher returning customer ratios perform better financially.
- Geography vs Revenue: Emirates with larger populations (Dubai, Sharjah) show higher SME revenue

Research Questions & Key Findings

1. Which industries show stronger SME growth?
 - F&B; and Healthcare SMEs show higher customer acquisition and recurring revenue.
2. Which Emirates contribute the most?
 - Dubai and Sharjah dominate SME revenue share.
3. How does churn affect SMEs?
 - Extremely high churn rate suggests retention challenges.
4. Do marketing investments lead to growth?
 - Yes, but diminishing ROI observed.
5. Are SMEs building customer loyalty?
 - Returning customers (56.22%) are slightly higher than new (43.78%)

Statistical Validation

Hypothesis:

SMEs with stronger returning customer base achieve higher revenue stability.

Result:

Hypothesis supported; returning customers significantly contribute to predictable sales streams

Final Recommendations

1. Customer Retention Focus: Introduce loyalty programs, subscription models, and after-sales support to reduce churn.
2. Optimize Marketing Spend: Shift from broad campaigns to digital targeting and analytics-driven marketing.
3. Geographic Expansion: Leverage growth potential in Ajman, Fujairah, and Ras Al Khaimah.
4. Digital Transformation: Encourage SMEs to adopt e-commerce platforms, CRM tools, and digital payments.
5. Industry-Specific Strategy: - F&B;: Focus on delivery apps & promotions. - Education: Scale online learning solutions. - Healthcare: Adopt telemedicine & digital booking systems. - Construction: Improve procurement efficiency.
6. Data-Driven Decision Making: SMEs should monitor KPIs (revenue, churn, customer retention, marketing ROI) through dashboards for proactive strategy adjustments