Submitted for Codebasics
Resume Project Challenge #7

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TELANGANA
GROWTH ANALYSIS

OBJECTIVES

Explore Datasets. Understand their attributes, categories and time period.

Analyze trends and patterns within each department.

Identify growth opportunities and areas needing attention.

Find correlation among these departments and report the overall growth of the state through insights and relevant visuals.

So that, this analysis would help the Telangana Government to make data-informed decisions that would further support the growth of the state.

Telangana

Key Facts

29th state of India formed by separating from Andhra Pradesh in 2014

11th Largest state by Area and 9th Largest state by GDP

The State comprises of 33 districts

State Capital city – Hyderabad, a second IT Hub of India, has got the recognition by UNESCO as "CREATIVE CITY" in the Gastronomy category.

Latest Achievement:

'Green Apple Award' for 'International Beautiful Buildings' in June 2023

Telangana 'T-Hub' wins 'National Technology Award' for contribution in tech-entrepreneurship in May 2023

About Data-Set

Telangana is one of the states in India having Open Data Policy
All the important data-sets are available at https://data.telangana.gov.in/

For this Resume Project Challenge we have been made available below data-sets for analysis

Stamps

Revenue generated from Document registrations and E-stamp challan payments

Transportation

Vehicle sales data from the RTA across districts categorized by fuel type, vehicle class, seating capacity, and other

TS-iPASS

Data concerning units or businesses established within the state under the **iPass**

RESEARCH QUESTIONS

AND

INSIGHTS FROM ANALYSIS

STAMP

Stamp paper is essential for confirming the legitimacy and authenticity of legal documents and is used as proof of the agreement or transaction in various legal transactions.

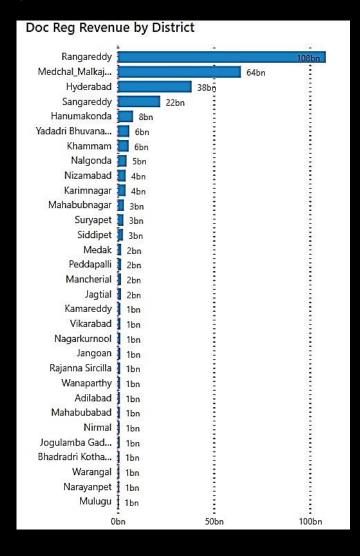Depending on the transaction, parties pay Stamp Duty while purchasing the stamp and also pay for registration of the documents. This forms a major source of State Government Revenue.

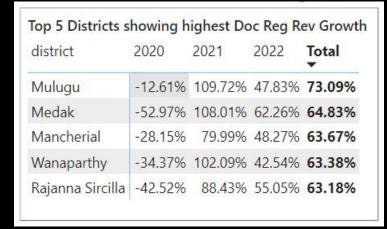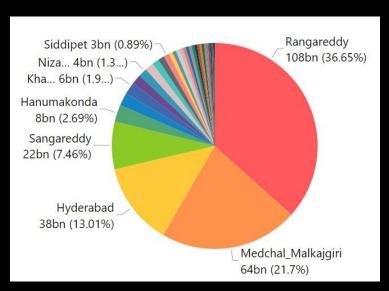Non Judicial Stamps are available as
- Stamp Papers (Traditional)
- E – Stamp Papers

In our Data-set, we have details regarding Revenue generated from Document Registrations and E-Stamp Challan Payments aggregated at the district and monthly level

Q 1. How does the revenue generated from document registration vary across districts in Telangana? List down the top 5 districts that showed the highest document registration revenue growth between FY 2019 and 2022.

Doc Reg Revenue by District

District	Revenue
Rangareddy	108bn
Medchal_Malkaj...	64bn
Hyderabad	38bn
Sangareddy	22bn
Hanumakonda	8bn
Yadadri Bhuvana...	6bn
Khammam	6bn
Nalgonda	5bn
Nizamabad	4bn
Karimnagar	4bn
Mahabubnagar	3bn
Suryapet	3bn
Siddipet	3bn
Medak	2bn
Peddapalli	2bn
Mancherial	2bn
Jagtial	2bn
Kamareddy	1bn
Vikarabad	1bn
Nagarkurnool	1bn
Jangoan	1bn
Rajanna Sircilla	1bn
Wanaparthy	1bn
Adilabad	1bn
Mahabubabad	1bn
Nirmal	1bn
Jogulamba Gad...	1bn
Bhadradri Kotha...	1bn
Warangal	1bn
Narayanpet	1bn
Mulugu	1bn

Top 5 Districts showing highest Doc Reg Rev Growth

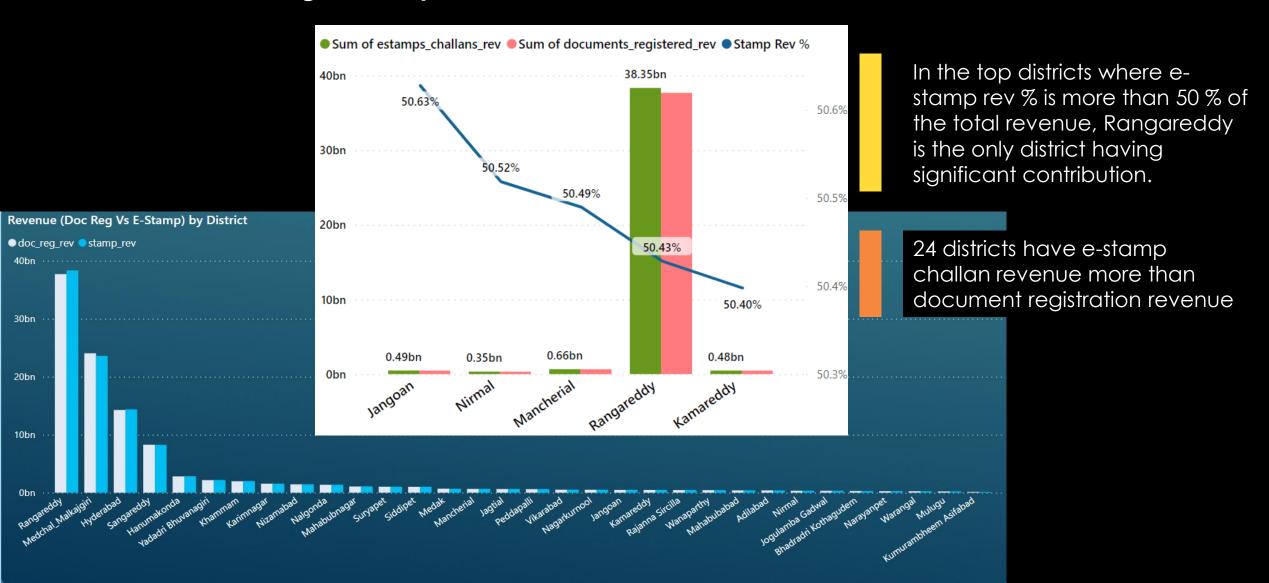| district	2020	2021	2022	Total
Mulugu	-12.61%	109.72%	47.83%	**73.09%**
Medak	-52.97%	108.01%	62.26%	**64.83%**
Mancherial	-28.15%	79.99%	48.27%	**63.67%**
Wanaparthy	-34.37%	102.09%	42.54%	**63.38%**
Rajanna Sircilla	-42.52%	88.43%	55.05%	**63.18%**

Top 5 districts that showed the highest document registration revenue growth percentage over 2019-2022 have lower contribution to the total revenue of the state
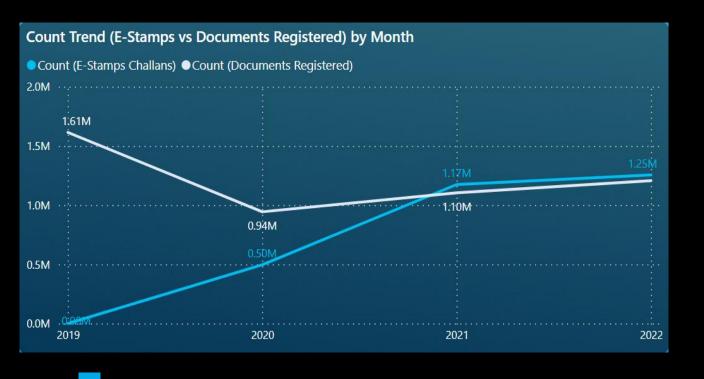
As per FY 2022 data, Rangareddy district contributes 36.65 % of the total revenue from Document Registration

As per FY 2022 data, Rangareddy, Medchal, Hyderabad and Sangareddy these 4 districts contribute 78.82 % of the total revenue from Document Registration

Pie chart: Siddipet 3bn (0.89%), Niza... 4bn (1.3...), Kha... 6bn (1.9...), Hanumakonda 8bn (2.69%), Sangareddy 22bn (7.46%), Hyderabad 38bn (13.01%), Medchal_Malkajgiri 64bn (21.7%), Rangareddy 108bn (36.65%)

Q 2. How does the revenue generated from document registration compare to the revenue generated from e-stamp challans across districts? List down the top 5 districts where e-stamps revenue contributes significantly more to the revenue than the documents in FY 2022?

● Sum of estamps_challans_rev ● Sum of documents_registered_rev ● Stamp Rev %

In the top districts where e-stamp rev % is more than 50 % of the total revenue, Rangareddy is the only district having significant contribution.

24 districts have e-stamp challan revenue more than document registration revenue

Revenue (Doc Reg Vs E-Stamp) by District

● doc_reg_rev ● stamp_rev

Q 3. Is there any alteration of e-Stamp challan count and document registration count pattern since the implementation of e-Stamp challan? If so, what suggestions would you propose to the government?

Count Trend (E-Stamps vs Documents Registered) by Month
● Count (E-Stamps Challans) ● Count (Documents Registered)

2.0M
1.61M
1.5M
1.25M
1.0M
1.17M
0.94M
1.10M
0.50M
0.5M
0.0M 0.00M
2019   2020   2021   2022

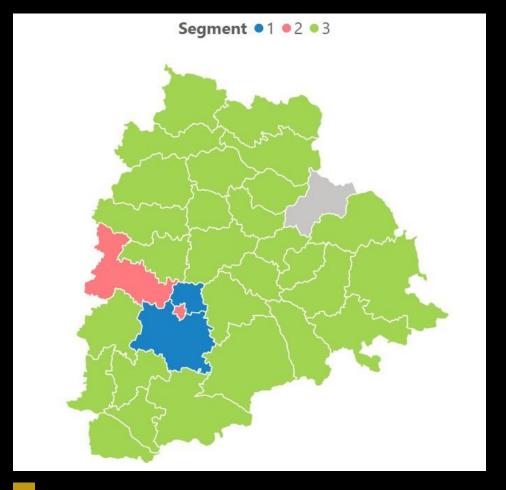Initially, after introduction of e-Stamps in Dec 2020, we see a reduction in the count of documents registered.

However, with time we see both the counts are having similar pattern and count of e-stamp challan is slightly more than count of Documents registered.

Physical stamp paper is said to be less secure and susceptible to counterfeit than e-stamp paper while e-stamp paper is considered more secure and it is easy to maintain their record in online systems.

Government can create awareness about ease of availing e-stamps online at **https://registration.telangana.gov.in/estamps.htm** and their registration process.

Q 4. Categorize districts into three segments based on their e-stamp registration revenue generation during the fiscal year 2021-22.

District	Revenue
Rangareddy	32333M
Medchal_Malkajgiri	18748M
Hyderabad	10894M
Sangareddy	6522M
Hanumakonda	3113M
Khammam	1645M
Yadadri Bhuvanagiri	1617M
Nalgonda	1221M
Nizamabad	1165M
Karimnagar	1078M
Mahabubnagar	900M
Suryapet	793M
Siddipet	747M
Peddapalli	508M
Medak	482M
Mancherial	444M
Jagtial	444M
Vikarabad	387M
Kamareddy	380M
Nagarkurnool	378M
Adilabad	333M
Wanaparthy	306M
Rajanna Sircilla	294M
Nirmal	294M
Jogulamba Gadwal	272M
Mahabubabad	264M
Jangoan	262M
Bhadradri Kothagude...	254M
Narayanpet	205M
Warangal	173M
Mulugu	149M
Kumurambheem Asif...	58M

Segment ● 1 ● 2 ● 3

Rangareddy District being outlier, vertical gridlines shifted towards right

TRANSPORTATION

Road Tax and Registration charges are paid to the Government during registration of vehicle.

In our Data set, we have information about vehicle sales data from the RTA(Regional Transport Authority) categorized by fuel type, vehicle class, seating capacity, and other general categories aggregated at the district and monthly level.

Fuel Type

- Petrol
- Diesel
- Electric
- Other

Vehicle Class

- Motor Cycle
- Motor Car
- Auto Rickshaw
- Agriculture
- Other

Seating Capacity

- 1 to 3
- 4 to 6
- Above 6

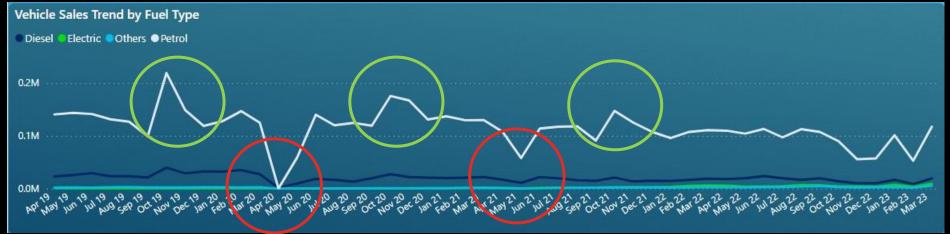Other Category

- Brand New
- Pre - Owned

Q 5. Investigate whether there is any correlation between vehicle sales and specific months or seasons in different districts. Are there any months or seasons that consistently show higher or lower sales rate, and if yes, what could be the driving factors? (Consider Fuel-Type category only)
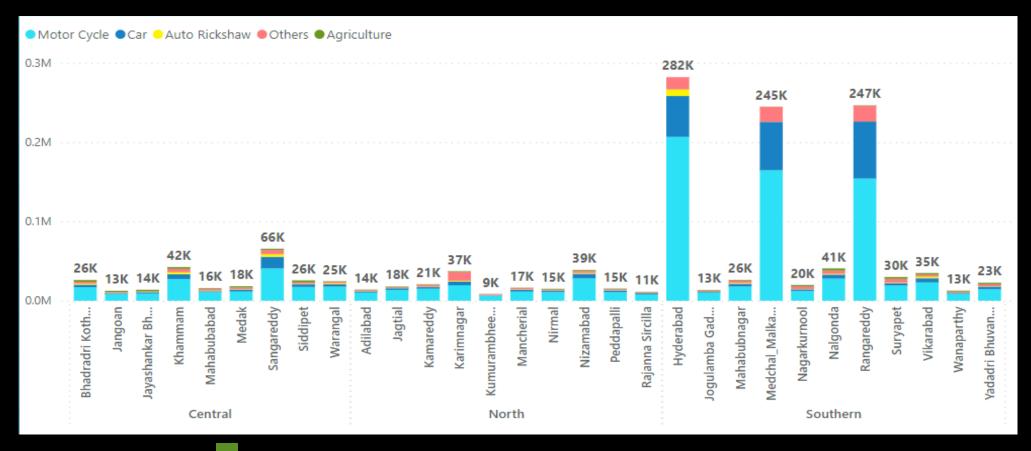
We can notice, rise of vehicle sales in Oct/ Nov due to various reasons such as Festivals like Dussehra (main festival of Telangana), ending of Vanakalam (Kharif Season)

During peak summer months, we see decrease in vehicle sales.

However, in 2022 vehicles sales was nearly constant and we didn't see rise in sales. This might be due multiple macro-economic factors like Global silicon chip shortage, Recession like situation affecting new employment generation.
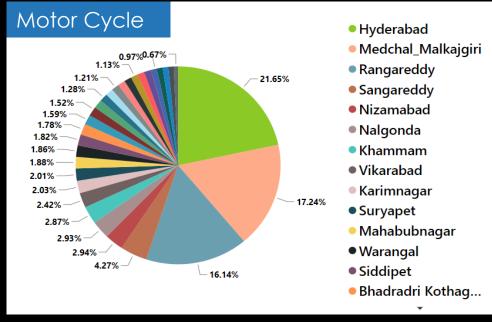

Vehicle Sales Trend by Fuel Type

Q 6. How does the distribution of vehicles vary by vehicle class (Motor Cycle, Motor Car, Auto-Rickshaw, Agriculture) across different districts? Are there any districts with a predominant preference for a specific vehicle class? Consider FY 2022 for analysis.
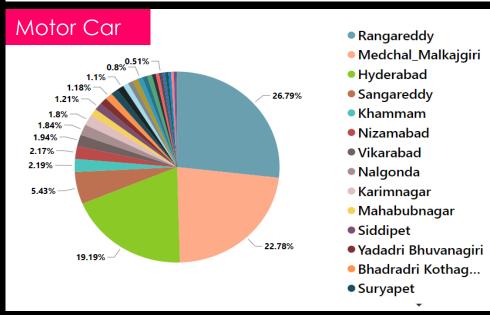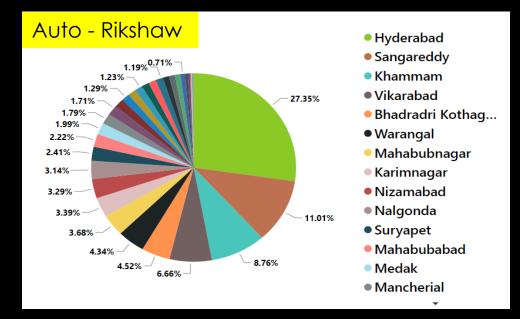

Variation of vehicles sales across districts by vehicle class

- **Preference for a specific vehicle class. Dominating districts. Considering FY 2022 for analysis.**

Motor Cycle

- Hyderabad — 21.65%
- Medchal_Malkajgiri — 17.24%
- Rangareddy — 16.14%
- Sangareddy — 4.27%
- Nizamabad — 2.94%
- Nalgonda — 2.93%
- Khammam — 2.87%
- Vikarabad — 2.42%
- Karimnagar — 2.03%
- Suryapet — 2.01%
- Mahabubnagar — 1.88%
- Warangal — 1.86%
- Siddipet — 1.82%
- Bhadradri Kothag... — 1.78%
- 1.59%
- 1.52%
- 1.28%
- 1.21%
- 1.13%
- 0.97%
- 0.67%

Auto - Rikshaw

- Hyderabad — 27.35%
- Sangareddy — 11.01%
- Khammam — 8.76%
- Vikarabad — 6.66%
- Bhadradri Kothag... — 4.52%
- Warangal — 4.34%
- Mahabubnagar — 3.68%
- Karimnagar — 3.39%
- Nizamabad — 3.29%
- Nalgonda — 3.14%
- Suryapet — 2.41%
- Mahabubabad — 2.22%
- Medak — 1.99%
- Mancherial — 1.79%
- 1.71%
- 1.29%
- 1.23%
- 1.19%
- 0.71%

Motor Car

- Rangareddy — 26.79%
- Medchal_Malkajgiri — 22.78%
- Hyderabad — 19.19%
- Sangareddy — 5.43%
- Khammam — 2.19%
- Nizamabad — 2.17%
- Vikarabad — 1.94%
- Nalgonda — 1.84%
- Karimnagar — 1.8%
- Mahabubnagar — 1.21%
- Siddipet — 1.18%
- Yadadri Bhuvanagiri — 1.1%
- Bhadradri Kothag... — 0.8%
- Suryapet — 0.51%

Vehicle Class	Dominating Districts	Contribution
Motor Cycle	• Hyderabad • Medchal • Rangareddy	55.03 %
Motor Car	• Rangareddy • Medchal • Hyderabad	68.76 %
Auto-Rikshaw	• Hyderabad	27.35 %

Q 7. List down the top 3 and bottom 3 districts that have shown the highest and lowest vehicle sales growth during FY 2022 compared to FY 2021?

district	Total_V_sales	Sales growth %	Growth Abs
Rangareddy	241738	12.52%	26905
Hyderabad	271211	4.74%	12270
Karimnagar	36350	4.42%	1538
Medchal_Malkajgiri	241429	2.22%	5243

Only 4 Districts in the Telangana have +ve sales growth for FY 22

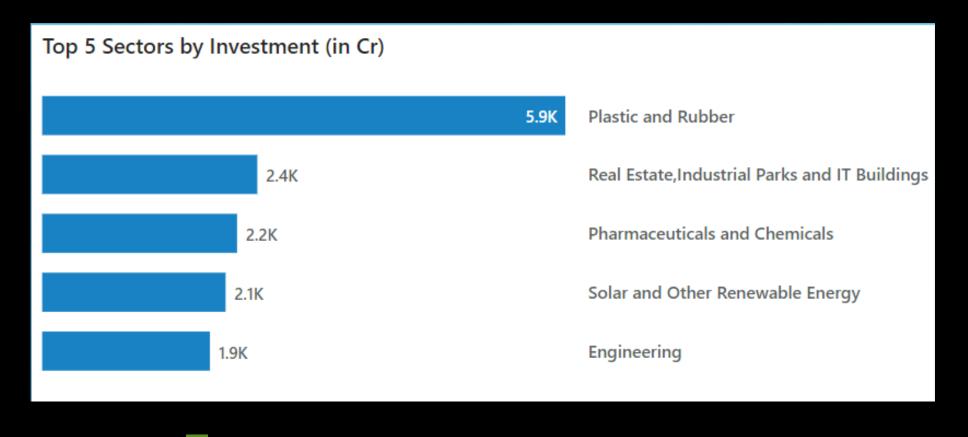| district	Total_V_sales	Sales growth %	Growth Abs
Warangal	23324	-44.69%	-18847
Jagtial	17739	-37.15%	-10487
Nirmal	14888	-34.45%	-7826

These are Bottom 3 Districts with – ve sales growth.

TS iPass

(Telangana State Industrial Project Approval and Self Certification System)

Implemented since 2014 through TS iPass Act.

Speedy processing of applications for issue of various clearances required for setting up of industries at a single point based on the self-certificate provided by the entrepreneur.

To create investor friendly environment in the State of Telangana and foster industrial growth.

In our Data-set, we have details regarding Investments made in various sectors and employment generated due the investment across districts by month.
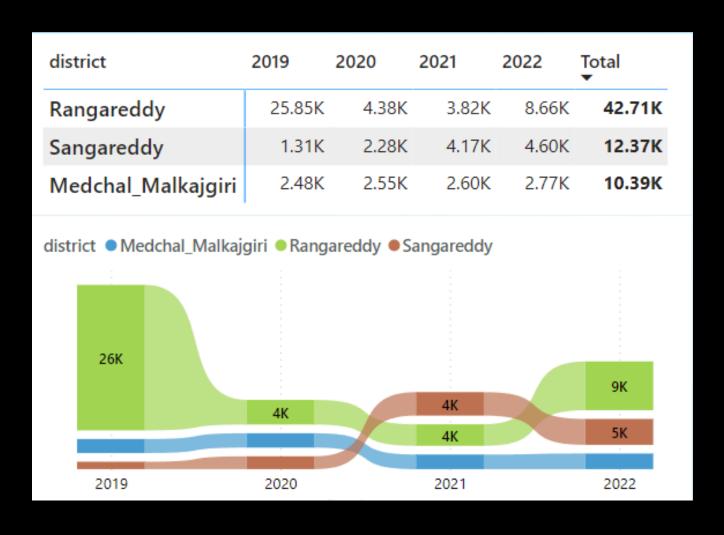
Q 8. List down the top 5 sectors that have witnessed the most significant investments in FY 2022.

Top 5 Sectors by Investment (in Cr)

Sector	Investment
Plastic and Rubber	5.9K
Real Estate,Industrial Parks and IT Buildings	2.4K
Pharmaceuticals and Chemicals	2.2K
Solar and Other Renewable Energy	2.1K
Engineering	1.9K

These 5 sectors have witnessed
most significant investment in FY 2022

For all the four FY consolidated from 19 to 22, Real Estate,
Industrial Parks and IT Buildings Sector has provided maximum
employment 52.23% among all other sectors.

Q 9. List down the top 3 districts that have attracted the most significant sector investments during FY 2019 to 2022? What factors could have led to the substantial investments in these particular districts?

district	2019	2020	2021	2022	Total ▼
Rangareddy	25.85K	4.38K	3.82K	8.66K	**42.71K**
Sangareddy	1.31K	2.28K	4.17K	4.60K	**12.37K**
Medchal_Malkajgiri	2.48K	2.55K	2.60K	2.77K	**10.39K**

district ● Medchal_Malkajgiri ● Rangareddy ● Sangareddy

Hyderabad is second IT Hub of India. However, over the past three years, it has emerged as a Favourite Startup destination.

Hence, district close to the capital are attracting huge investments

Availability of Robust Infrastructure, especially in Real Estate, Information Technology, Pharmaceuticals and Chemical sectors

Wide presence of PSUs like DRDO, BEL, HAL, BHEL, ECIL, NFC, ISRO etc.

Q 10. Is there any relationship between district investments, vehicles sales and stamps revenue within the same district between FY 2021-2022?

district	Investment in cr
Medchal_Malkajgiri	2,595.63
Narayanpet	1,486.09
Rangareddy	3,816.83
Sangareddy	4,173.80
Yadadri Bhuvanagiri	1,292.73
Total	13,365.07

district	total_revenue
Hanumakonda	4191M
Hyderabad	21606M
Medchal_Malkajgiri	36949M
Rangareddy	64198M
Sangareddy	12867M
Total	139810M

district	employees
Medchal_Malkajgiri	14696
Nalgonda	6011
Rangareddy	9832
Sangareddy	22812
Yadadri Bhuvanagiri	9742
Total	63093

district	Total_V_sales
Hyderabad	266602
Medchal_Malkajgiri	238395
Nizamabad	54920
Rangareddy	216631
Sangareddy	65180
Total	841728

Tables consists of Top 5 Districts by Investment, Total Stamp Revenue, Employment generation & Vehicle Sales.
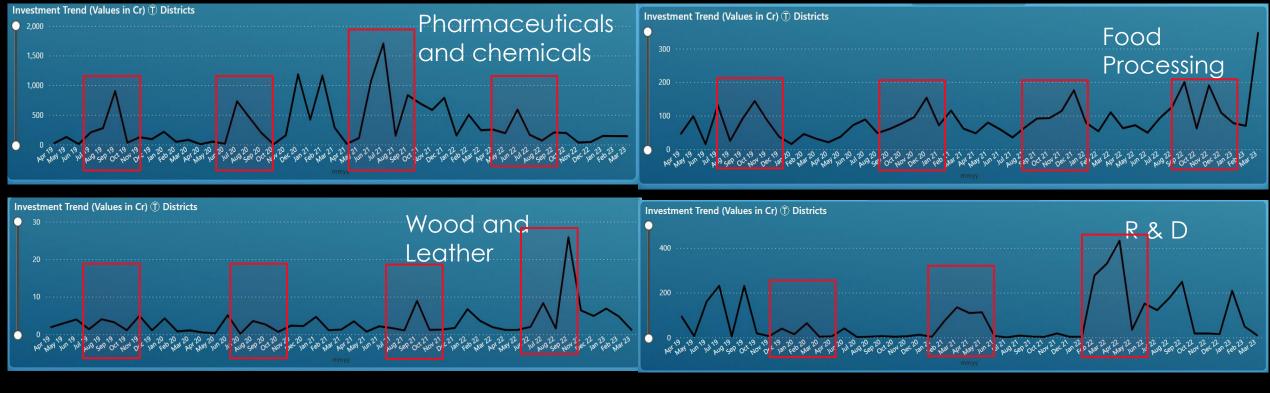
We observe 3 districts common in each table.
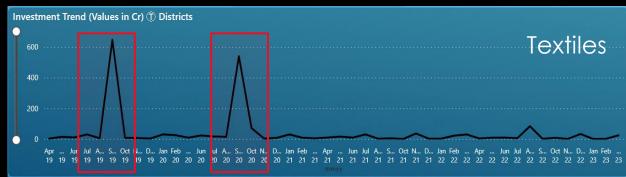
This indicates a positive relationship between given metrics.

Q 11. Are there any particular sectors that have shown substantial investment in multiple districts between FY 2021-2022?

sector	Sum of investment in cr
⊞ **Pharmaceuticals and Chemicals**	6,860.93
⊞ **Plastic and Rubber**	2,059.62
⊞ Beverages	1,843.68
⊞ Food Processing	999.36
⊞ Engineering	967.52
Total	12,731.12

Sector with wider presence	No of Districts
Pharmaceuticals & Chemicals	24
Plastic and Rubber	23
Beverages	21
Food Processing	33
Engineering	30

Q 12. Can we identify any seasonal patterns or cyclicality in the investment trends for specific sectors? Do certain sectors experience higher investments during particular months?
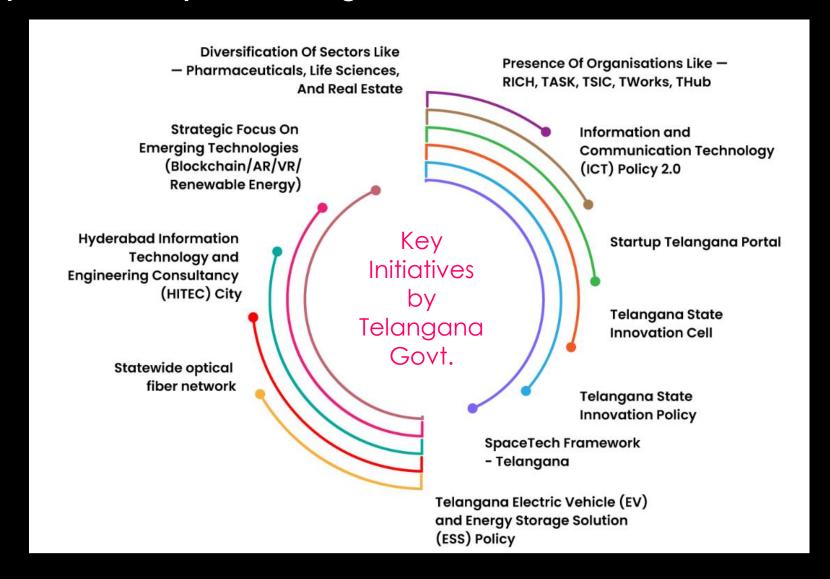
SECONDARY RESEARCH QUESTIONS

AND

INSIGHTS FROM ANALYSIS
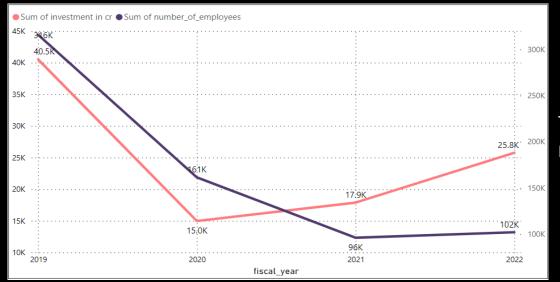
Q 1. What are the top 5 districts to buy commercial properties in Telangana? Justify your answer.

Hyderabad
- Presence of global tech giants like Google and Amazon
- Hyderabad has emerged as one of the top five startup hubs for leading sectors, including ecommerce, health-tech, edtech and media & entertainment.
- Growing Metropolitan city
- Best Education Facilities like IIT

Rangareddy
- Exponentially developing district of Telangana

Medchal Malkajgiri
- Presence of PSUs and Pharma/ Chemical Industry
- 3rd highest GDP contributing District

Sangareddy
- Areas around district centre are developing faster.

Karimnagar
- The district and its towns are evenly developed and growing faster.

Q 2. What significant policies or initiatives were put into effect to enhance economic growth, investments, and employment in Telangana by the current government? Can we quantify the impact of these policies using available data?

Key Initiatives by Telangana Govt.

- Diversification Of Sectors Like — Pharmaceuticals, Life Sciences, And Real Estate
- Strategic Focus On Emerging Technologies (Blockchain/AR/VR/Renewable Energy)
- Hyderabad Information Technology and Engineering Consultancy (HITEC) City
- Statewide optical fiber network
- Telangana Electric Vehicle (EV) and Energy Storage Solution (ESS) Policy
- SpaceTech Framework - Telangana
- Telangana State Innovation Policy
- Telangana State Innovation Cell
- Startup Telangana Portal
- Information and Communication Technology (ICT) Policy 2.0
- Presence Of Organisations Like — RICH, TASK, TSIC, TWorks, THub

Source: inc42.com

Q 3. Provide top 5 Insights & 5 recommendations to Telangana government for sustained growth in the next 5 years based on your analysis.

● Sum of investment in cr   ● Sum of number_of_employees
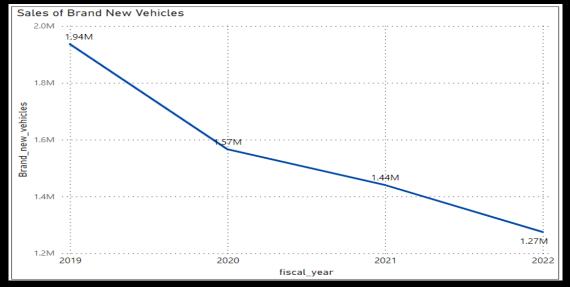
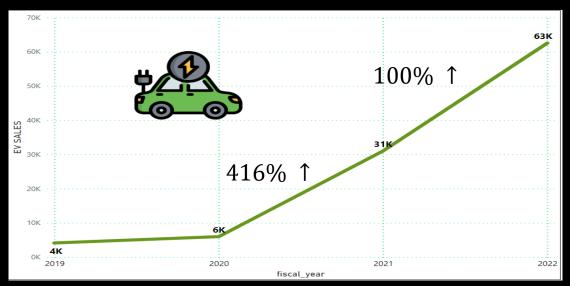Though Investment in the last 2 FYs is showing rise, new Employment Generation is stable.

Sectors by Employee-Investment Ratio

sector	Emp/Inv
Wood and Leather	28.59
Cement, Cement & Concrete Products, Fly Ash Bricks	21.32
Electrical and Electronic Products	16.93
Textiles	14.20
Fertlizers Organic and Inorganic,Pesticides,Insecticides, and Other Related	13.94
Engineering	11.08

Govt can encourage sector having Low Emp/Inv ratio. So that maximum employment can be generated in these sectors with minimum investment.

Q 3. Provide top 5 Insights & 5 recommendations to Telangana government for sustained growth in the next 5 years based on your analysis.
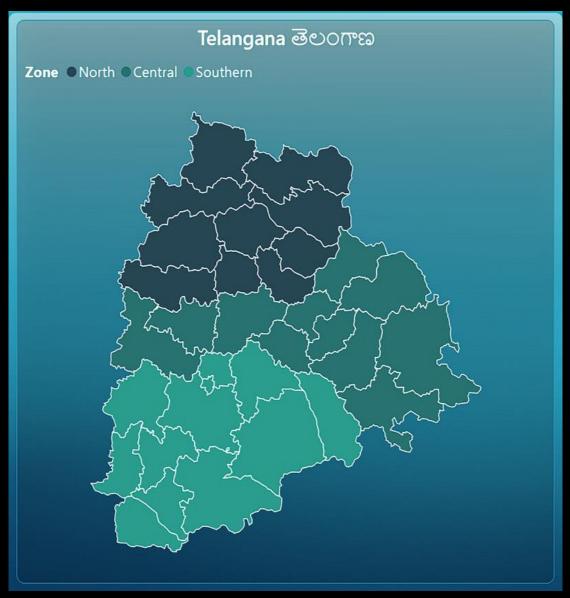

Sales of Brand New Vehicles is decreasing YOY. Also it is directly proportional to the new employment generation.

Rise in the sales of Electric Vehicles is noteworthy. Telangana Govt's EV-ES policy is showing excellent results. However, Govt can continue to give concession in Road Tax and Registration fees considering the environment friendly nature of Evs.

Q 3. Provide top 5 Insights & 5 recommendations to Telangana government for sustained growth in the next 5 years based on your analysis.

- When all data-sets like GDP, Revenue Generation, Investment, Employment, Vehicle Sales are plotted across districts, we can easily conclude that only the heart-land of the state around capital Hyderabad is developing with exponential rate.

- However, Government should work on evenly distributing the growth and development across all the districts by leveraging local resources and demographics

Q 3. Provide top 5 Insights & 5 recommendations to Telangana government for sustained growth in the next 5 years based on your analysis.

Telangana తెలంగాణ

Zone ● North ● Central ● Southern
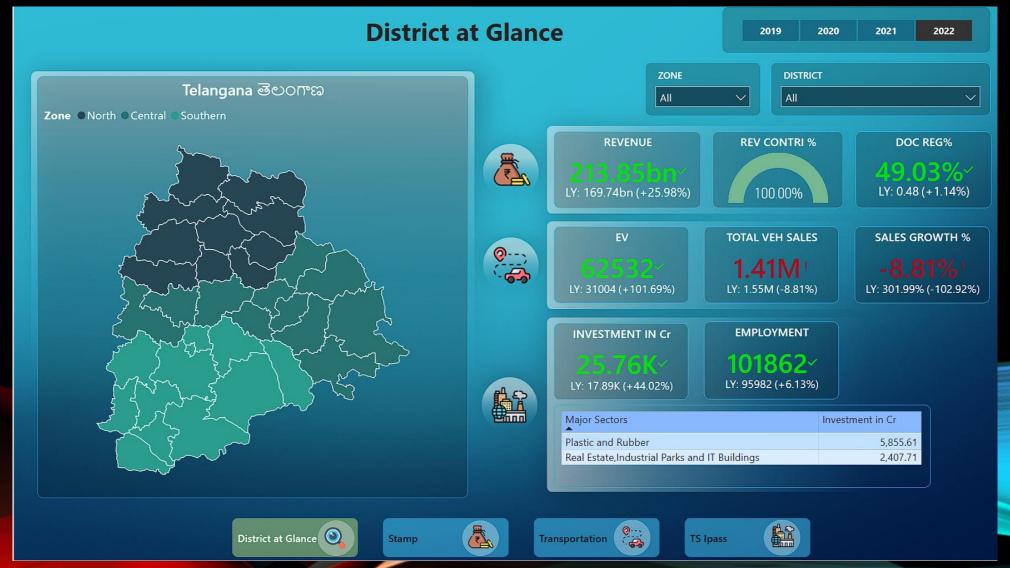
- Telangana State is classified into three agro-climatic zones based on the geographical characteristics such as rainfall, temperature, nature of soils etc. as:

  North Zone, Central Zone, South Zone
  (source: https://pjtsau.edu.in/agro-climatic-zones.html)

- I have incorporated this zonal classification into this analysis project.
- It is worth noting that among the three zones, **districts in North zone score lowest** in all the given metrics like Revenue contribution, Vehicle Sales, Investment received, Employment generation.
- However, Southern zone comes First among three.

Power Bi Dashboard

REVENUE
(E-Stamps+DocReg)
213.85bn
LY: 169.74bn (+25.98%)

REV CONTRI %
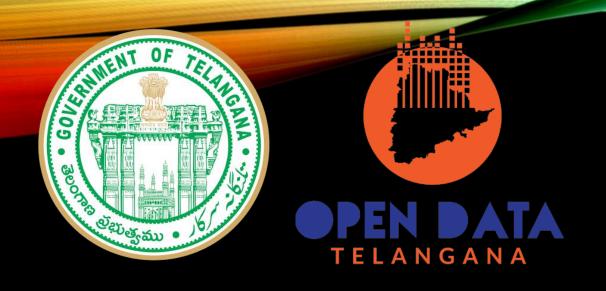**100.00%**

ZONE
All

DISTRICT
All

2019 | 2020 | 2021 | 2022

DOC REG %
49.03%
LY: 0.48 (+1.14%)

COUNT E-STAMP
1254961
LY: 1173978 (+6.9%)

AVG REV PER STAMP
86.86K
LY: 74.50K (+16.59%)

Revenue Trend (Doc RegVs E-Stamp) by Month
○ Doc Reg Rev ● E-Stamp Rev

10bn
5bn
0bn
Jan 2020 · Jan 2021 · Jan 2022 · Jan 2023

month

Revenue (Doc Reg Vs E-Stamp) by District
○ Doc Reg Rev ● E-Stamp Rev

Rangareddy
Medchal_M...
Hyderabad
Sangareddy
Hanumakon...
Yadadri Bhu...
Khammam
Nalgonda
Nizamabad
Karimnagar
Mahabubna...
Suryapet
Siddipet
Medak
Peddapalli
Mancherial
Jagtial
Kamareddy
Vikarabad

0.0T ··· 0.1T

Districts by Doc Rev % Growth, Total Revenue & RC %

District	Doc Rev % Growth	Total Revenue	RC %
Mulugu	73.09%	0.92bn	0.18%
Medak	64.83%	3.02bn	0.58%
Mancherial	63.67%	2.91bn	0.57%
Wanaparthy	63.38%	1.96bn	0.38%
Rajanna Sircilla	63.18%	1.99bn	0.39%
Karimnagar	62.67%	7.01bn	1.36%

Count Trend (E-Stamps vs Documents Registered) by Month
● Count (E-Stamps Challans) ○ Count (Documents Registered)

2M
1M
0M
2019 · 2020 · 2021 · 2022

District at Glance | Stamp | Transportation | TS Ipass

Dhaval Patel   Hemanand Vadivel

Founders: CodeBasics.io

Thank You !

Abhijeet Kamble

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