

Indian Startup Ecosystem Analysis (2016- 2024)

Exploring The Industry and State wise trends in startup Recognition

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Summary

This report analyses real-time startup recognition data across Indian states and industries from 2016 to 2024. The goal is to uncover key trends, regional dominance, industry performance, and changes during pre-, during-, and post-COVID periods. The analysis uses Python-based tools (Python, Pandas, Seaborn, Matplotlib, Plotly) and includes outlier detection, correlation analysis, and visual storytelling to derive insights for stakeholders and ecosystem observers.

Dataset Overview

- Source: [Dataful.in](https://dataful.in)
- Timeframe: 2016 to 2024
- Fields: Year, State, Industry, Startups Recognized
- Data Quality: No nulls, no duplicates

Methodology

- **Tools & Libraries Used:**
 - pandas: Data manipulation and cleaning
 - matplotlib & seaborn: Data visualization
 - plotly: Interactive and advanced visualizations
 - scipy: Statistical operations (e.g., outlier detection)

- **Analytical Steps Followed:**

Data Cleaning:

- Removed duplicates and checked for null values.
- Verified and standardized data types.

Exploratory Data Analysis (EDA)

- Explored trends across industries, states, and years.

Trend Visualization

- Used bar plots, line graphs, and heatmaps for pattern recognition.

Outlier & Correlation Analysis

- Applied Z-score and correlation matrices to uncover statistical insights.

COVID-Phase Segmentation

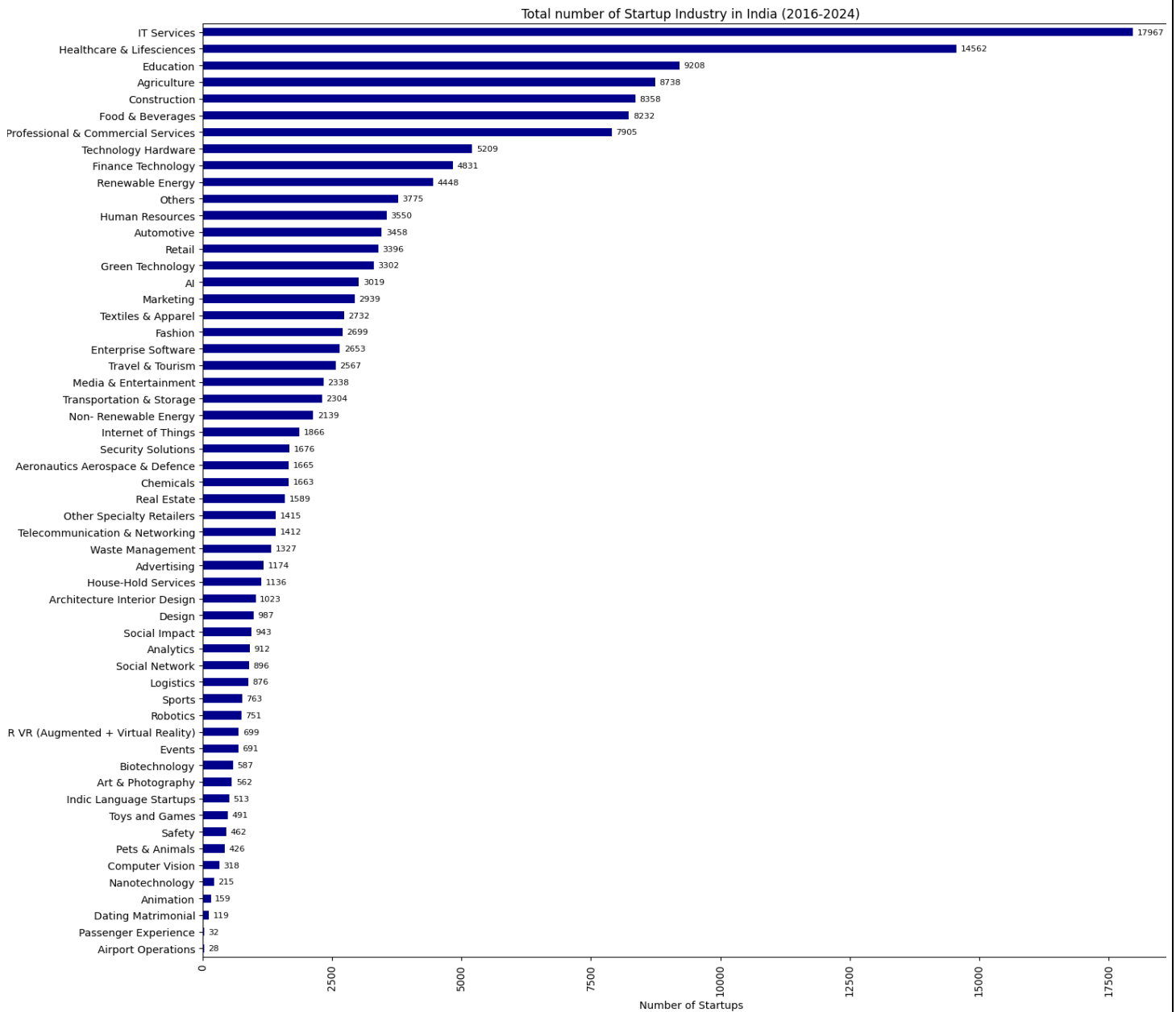
- Classified data into Pre-COVID, During COVID, and Post-COVID periods for comparative analysis.

Insight Generation

- Interpreted visual patterns and extracted meaningful business insights.

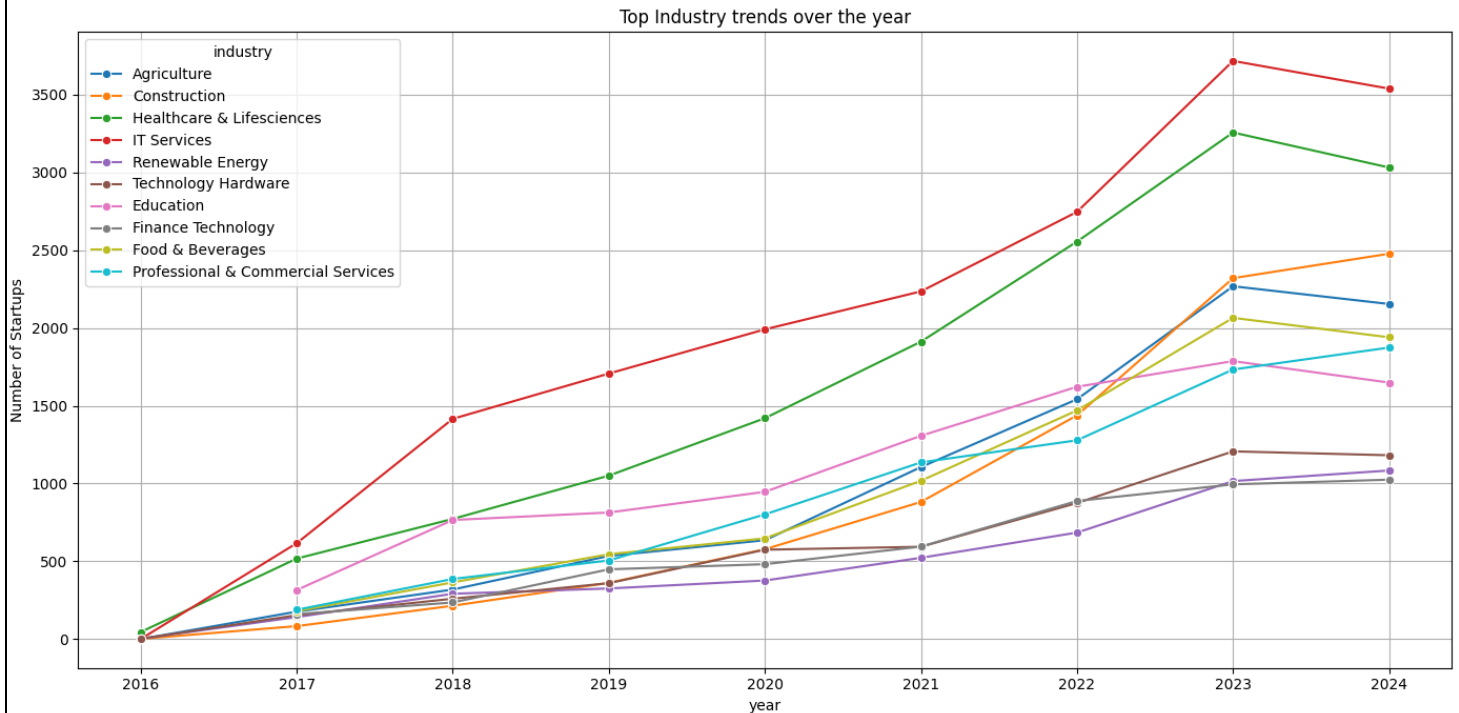
Key Analysis

Total Number of different Startups recognized in India



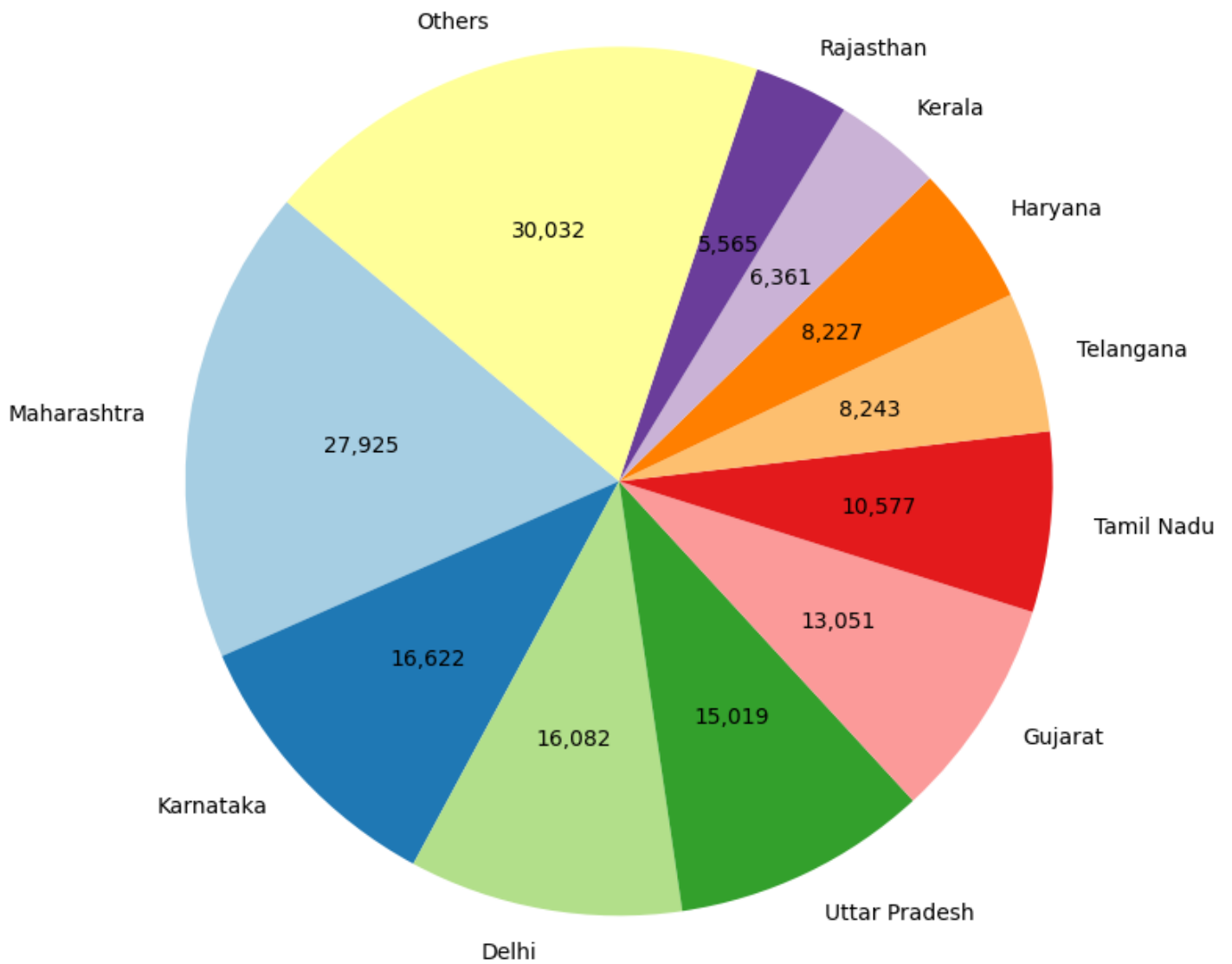
The Indian startup ecosystem from 2016 to 2024 has been dominated by IT Services and Healthcare & Lifesciences sectors. these two industries alone account for the highest cumulative startup recognitions, indicating a strong digital and health focused entrepreneurial trend across the country.

Top Startup Trends over the Years (2016-2024)

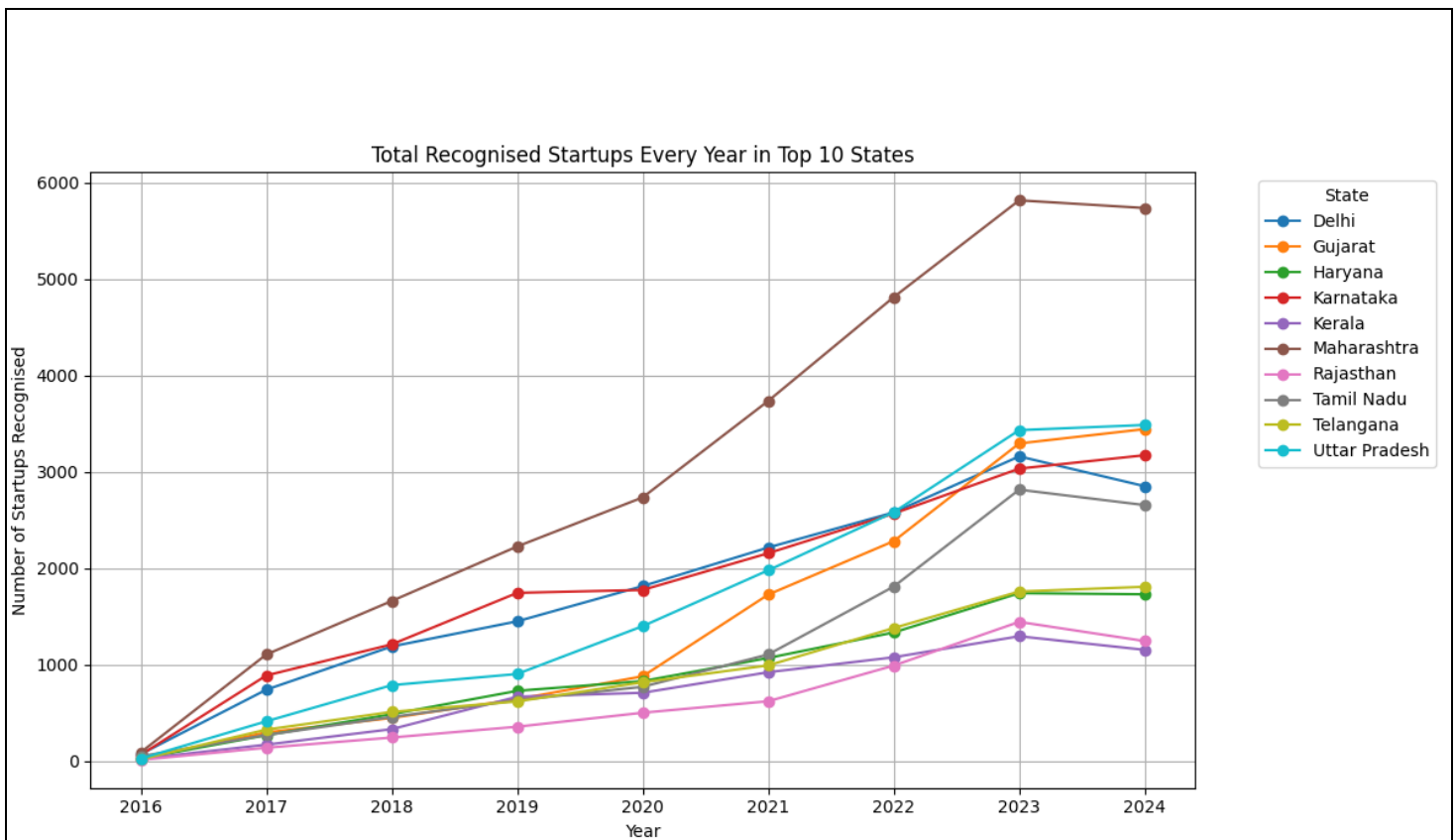


- From 2016 to 2024, IT services and Healthcare & Lifesciences have consistently led the Indian startup landscape, showcasing dominant and sustained growth.
- Post-2022, a notable surge in Agriculture and Construction startups is observed, indicating a new wave of growth in infrastructure and agritech sectors after 2022.
- Interestingly, Education startups, Which experienced strong momentum during pandemic shows a declining trend post covid, possibly due to saturation or shifting market dynamics in EdTech.

Top 10 States by Recognised Startups



- Maharashtra and Karnataka are the leading startup hubs in India likely due to the presence of Mumbai and Bengaluru, which are financial and tech capital of India.
- Delhi and Uttar Pradesh also contribute significantly showing north India's strong startup presence.



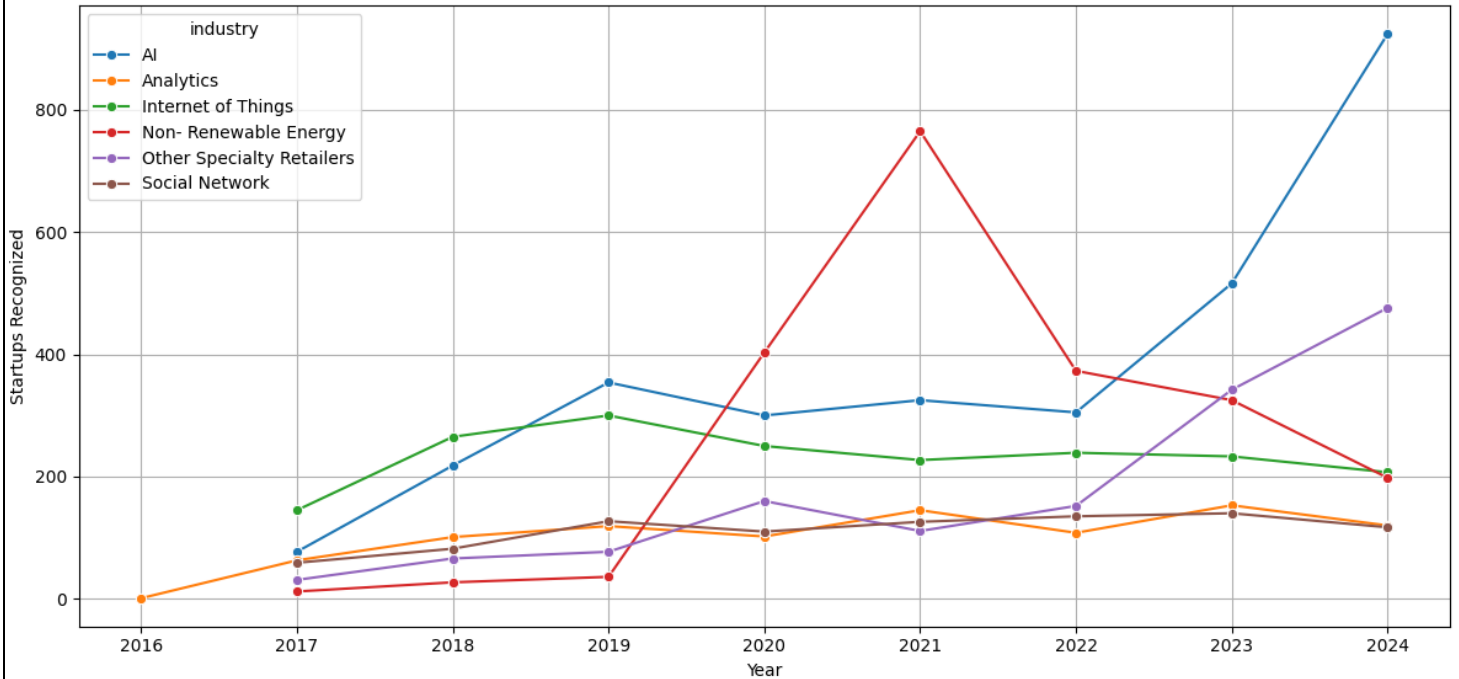
-A sharp rise in recognized startups in Gujarat post-2020 can be directly linked to the launch of the Gujarat Industrial Policy 2020, which provided targeted support through subsidies and startup-friendly reforms.

-Karnataka despite being home to Bengaluru a major tech hub, the state shows slowdown in startup recognition post 2020, this could indicate market saturation and startup migration to other states. Maharashtra continues to lead in total recognized startups due to Mumbai's financial ecosystem and Pune's tech corridor.

-Other states show consistent growth, highlighting decentralization of startups and their trajectories imply founders are increasingly leveraging local resources and state incentives to build startups in diverse geographies.

Outlier Industries

Detected outlier Industries over Time



-AI startups surged post-2022, aligning with the global generative AI boom, increased VC funding, and adoption across different sectors.

-Non-Renewable Energy startups peaked in 2021 amid India's coal shortage and energy security push but declined post 2021 as policies and investments shifted back to renewable energy.

-IoT saw strong early growth, but plateaued post 2020 likely due to hardware import challenges and unclear ROI in the Indian market.

-Other Speciality Retailers Experienced a sharp rise post-2022, driven by quick commerce, D2C niche brand growth and ONDC-enabled digital inclusion.

-Analytics and social Network startups grew steadily but lacked the breakout trajectory of AI or retail, suggesting more gradual adoption or market saturation.

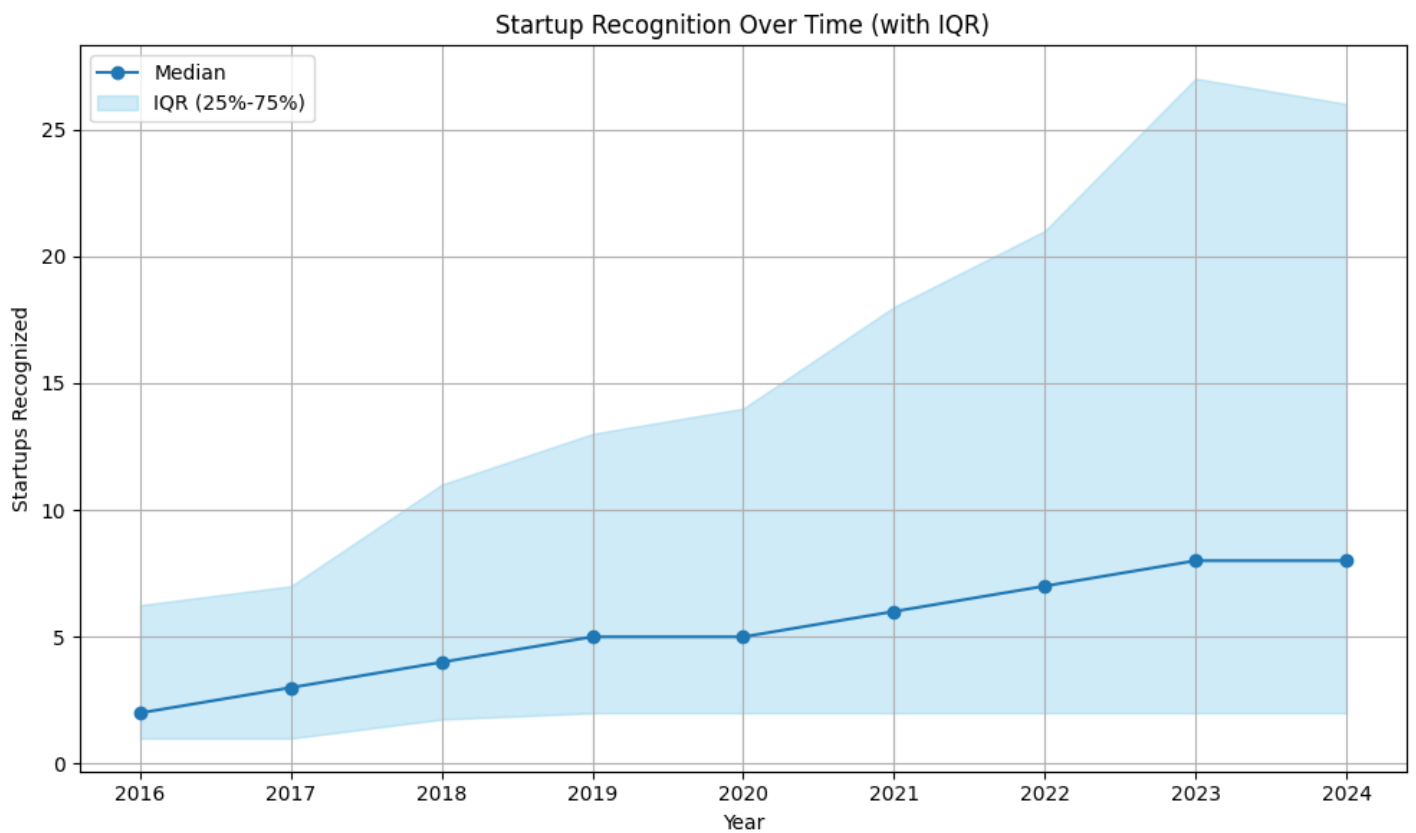
New And Emerging Industries

industry	First_appeared	Total_startups
Passenger Experience	2021	32
Airport Operations	2020	28
Logistics	2020	876
Biotechnology	2020	587
Toys and Games	2020	491
Waste Management	2019	1327
Advertising	2017	1174
AI	2017	3019

	industry	CAGR (%)
0	Waste Management	232.597424
1	IT Services	177.712053
2	Agriculture	161.009138
3	Toys and Games	149.095099
4	Construction	143.563385
5	Automotive	128.608489
6	Travel & Tourism	123.651488
7	Green Technology	123.562045
8	Technology Hardware	122.048802
9	Transportation & Storage	116.573677
10	Enterprise Software	116.236243
11	Fashion	111.175393

Several industries that emerged in 2019 and beyond are exhibiting exceptionally high growth rates, suggesting strong future potential. Waste management (232%), Toys & Games (149%) and Biotechnology (103%) are standout performers, likely driven by sustainability mandates, digital entertainment shifts, and pandemic-related health innovation respectively. Logistics and Passenger Experience also show robust early-stage momentum, highlighting changing consumer expectations and service digitization.

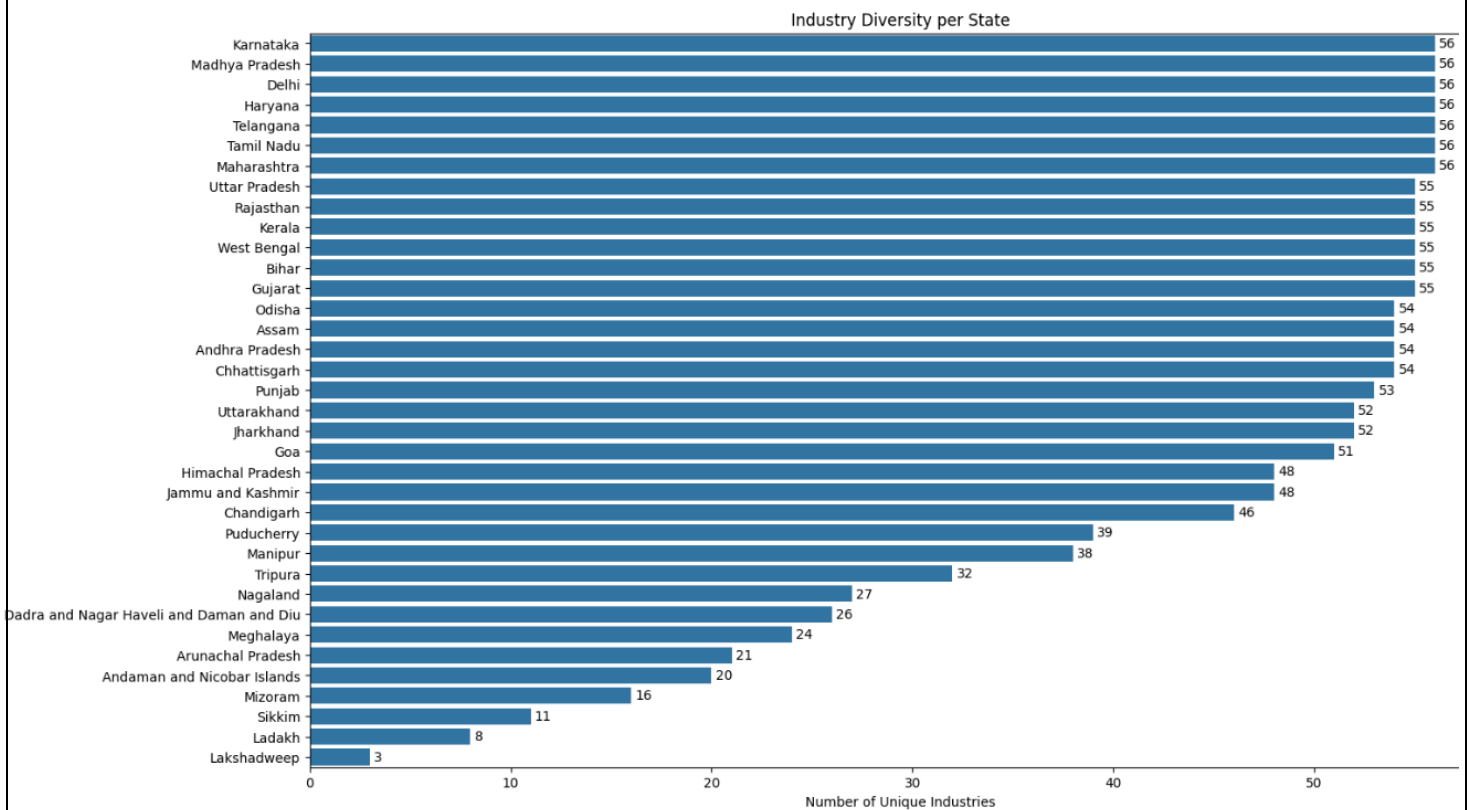
Startup recognition overtime Inter Quartile Range



From 2016-2024, the median gradually increased, reflecting a steady rise in typical startup activity across the country.

Meanwhile, the IQR expanded significantly, especially post-2020 indicating a rapid increase in diversity and dispersion of startup recognition.

Industry Diversity By state



-Karnataka, Madhya Pradesh, Delhi, Haryana, Telangana, and Tamil Nadu exhibit the highest industry diversity, each hosting startups in all 56 tracked sectors. This reflects the maturity and inclusiveness of their startup ecosystems, where innovation spans from core tech to traditional sectors such as agriculture, retail.

-Maharashtra, Uttar Pradesh, Rajasthan, Kerala, and West Bengal follow closely, suggesting strong multi-sectoral participation and balanced development across domains.

-In contrast, North Eastern and Union Territory regions such as Sikkim, Mizoram, Arunachal Pradesh, Andaman & Nicobar, Ladakh, and Lakshadweep show significantly lower diversity, with fewer than 25 industries represented — indicating a narrower innovation base.

Covid Effect on the startup Trends

Recovered Industries: period industry	Pre-COVID	During COVID	Post-COVID
AI	649	625	1745
AR VR (Augmented + Virtual Reality)	200	149	350
Advertising	260	239	675
Analytics	284	247	381
Animation	31	28	100
Art & Photography	106	93	363
Computer Vision	101	95	122
Design	255	235	497
Enterprise Software	735	563	1355
Green Technology	812	681	1809
Indic Language Startups	75	74	364
Internet of Things	710	477	679
Nanotechnology	58	53	104
Others	1316	1084	1375
Robotics	198	172	381
Social Network	268	236	392
Travel & Tourism	540	455	1572

-No major industries collapsed post-COVID, most have either recovered or surged.

-industries like AI, Waste Management, Biotech, Logistics and Toys & games are showing high momentum.

-These trends suggest shifting innovation focus in post-pandemic India towards sustainability, health, automation and digital infrastructure.

Surged Industries: period industry	Pre-COVID	During COVID	Post-COVID
Aeronautics Aerospace & Defence	206	326	1133
Agriculture	1032	1742	5964
Airport Operations	0	7	21
Architecture Interior Design	143	199	681
Automotive	413	688	2357
Biotechnology	0	110	477
Chemicals	124	337	1202
Construction	663	1460	6235
Dating Matrimonial	25	26	68
Education	1896	2254	5058
Events	123	144	424
Fashion	309	435	1955
Finance Technology	846	1077	2908
Food & Beverages	1091	1666	5475
Healthcare & Lifesciences	2388	3332	8842
House-Hold Services	208	214	714
Human Resources	420	717	2413
IT Services	3741	4226	10000
Logistics	0	188	688
Marketing	586	721	1632
Media & Entertainment	491	520	1327
Other Specialty Retailers	174	271	970
Passenger Experience	0	4	28
Pets & Animals	64	84	278
Professional & Commercial Services	1082	1938	4885
Real Estate	239	243	1107
Renewable Energy	763	900	2785
Retail	648	822	1926
Safety	77	128	257
Security Solutions	234	401	1041
Social Impact	190	222	531
Sports	134	171	458
Technology Hardware	776	1169	3264
Telecommunication & Networking	264	351	797
Textiles & Apparel	293	514	1925
Toys and Games	0	83	408
Transportation & Storage	523	546	1235
Waste Management	1	224	1102

Key Takeaways – Indian Startup Ecosystem (2016–2024)

-Industry Leaders: IT Services and Healthcare & Lifesciences consistently dominated in startup recognitions across the years.

-Emerging Sectors: Post-2022 saw surges in Agriculture, Consumer Services, and Food & Beverages, indicating growing rural and consumer-focused innovation.

-COVID-19 Impact: No major industry collapsed post-COVID. Sectors like AI, Biotech, Waste Management, Toys & Games, and Logistics showed strong post-pandemic growth.

-State-Level Trends: Maharashtra, Karnataka, Delhi, and Tamil Nadu are the top contributors, showing both volume and diversity of industries. North-Eastern states and Union Territories showed limited industry spread, signalling potential for future policy focus.

-High-Growth Industries (by CAGR): Waste Management, IT Services, Agriculture, and Toys & Games had the highest compound growth rates — reflecting future-ready, scalable sectors.

-Low-Growth Sectors: Some traditional sectors like Stationery, Printing, and Leather showed stagnation or decline, hinting at digital shift.

-Recovery Patterns: Most industries hit during COVID recovered strongly, especially in health-tech, logistics, and remote service industries.

-Strategic Insight: India's startup growth is diversifying across sectors and geographies — policy and investment should target underserved regions and high-CAGR sectors.