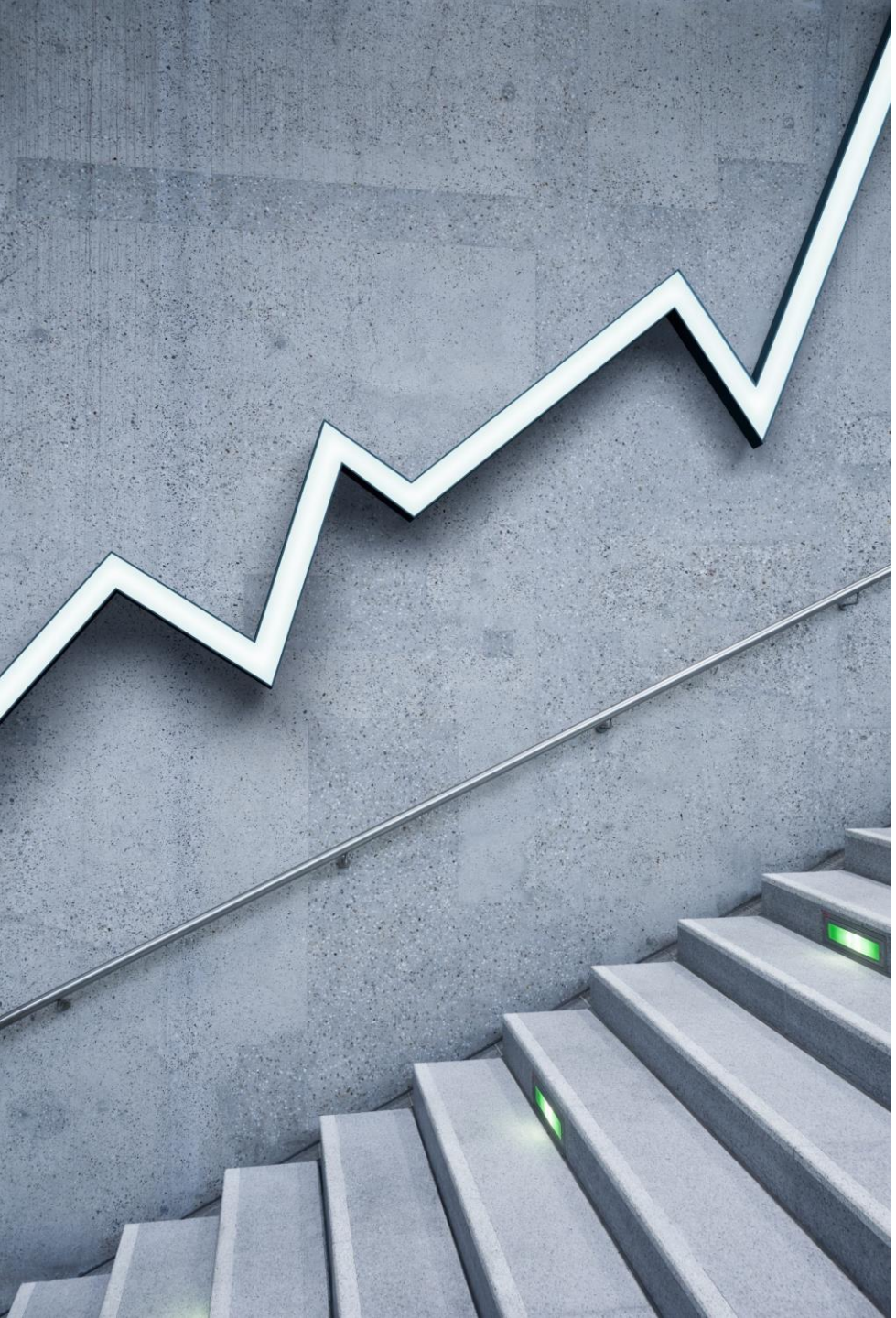

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DATA SCIENCE INTERNSHIP

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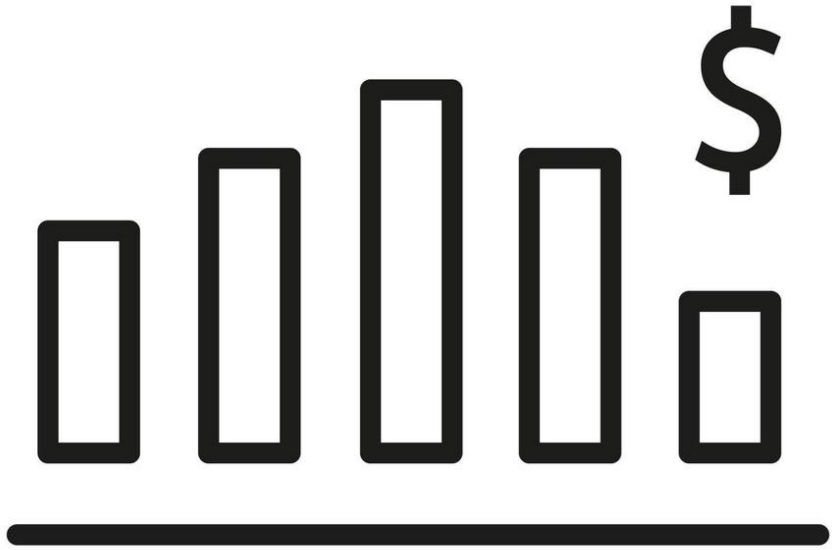


Financial Analytics

Introduction

Analyzing competition is crucial for business survival. This dataset includes market capitalization and quarterly sales of India's top 500 companies.

Examining metrics and relationships between Market Capitalization (in crores) and Quarterly Sales (in crores) will provide actionable insights for management to enhance results.

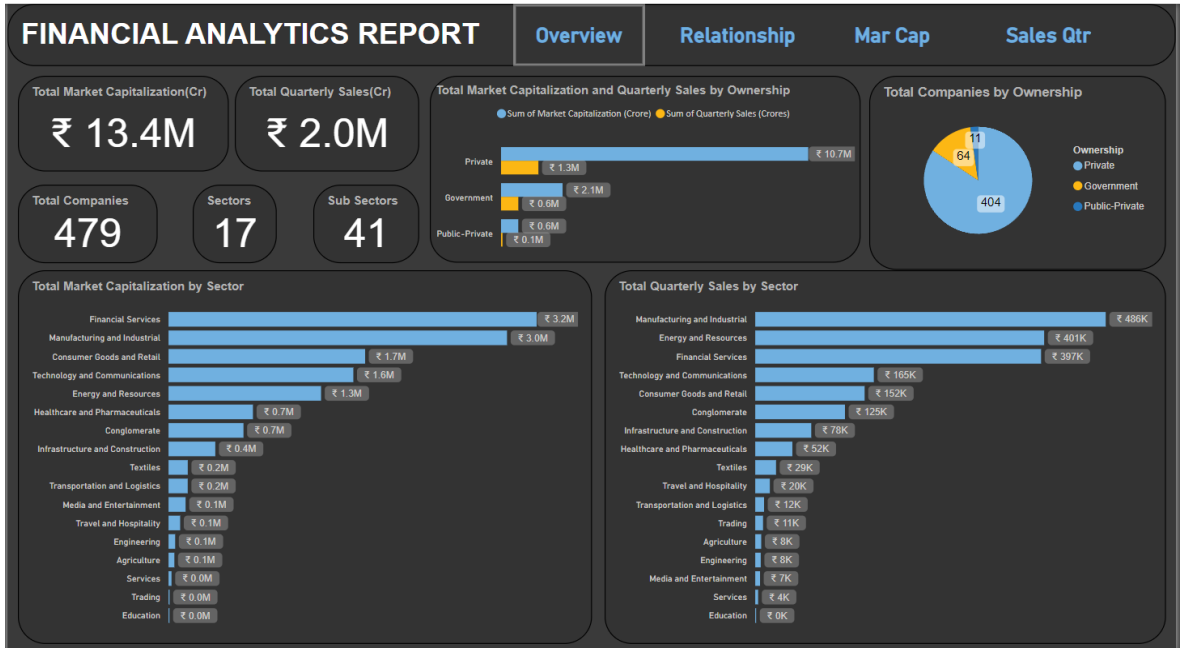
Details of Data

- Company Name
- Mar. Cap. – Crore
- Sales Qtr. – Crore

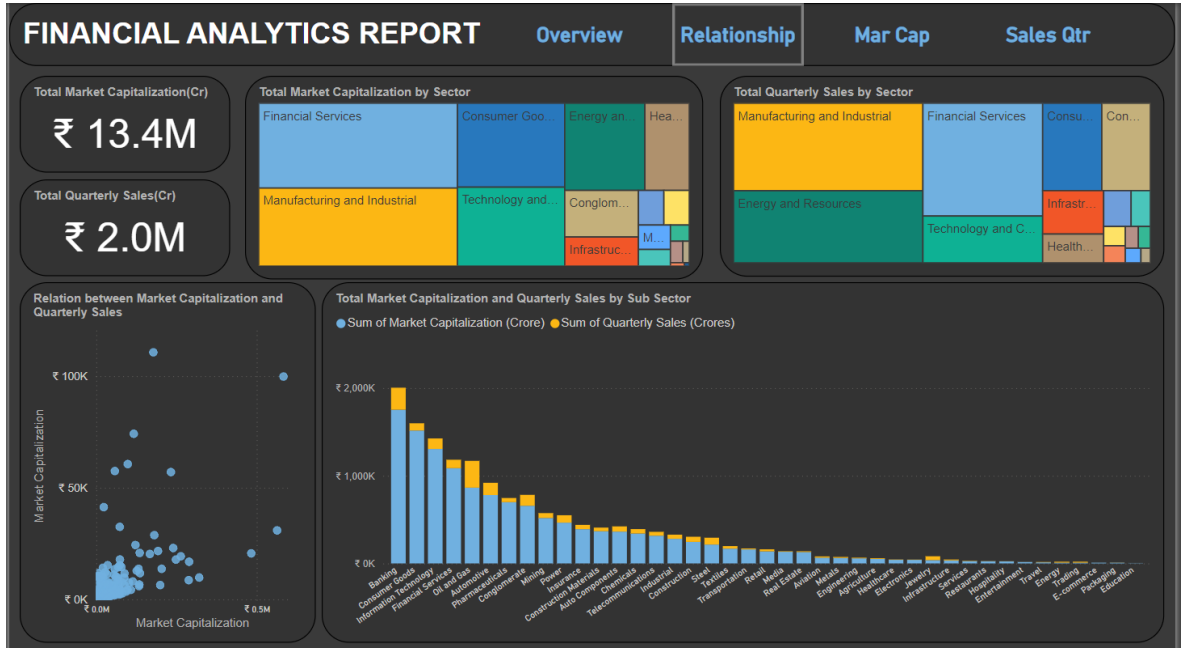
Main KPIs

- **Mar. Cap.** – Total Market Capitalization of a company.
- **Sales Qtr.** – Total Quarterly Sales of a company.
- Further segregated Companies as follows using web surfing and Claude AI.
  - **Ownership** – Company is the hands of Public (or) Private (or) Public-Private.
  - **Sector** – Specifies the major sector in which a company operates.
  - **Sub Sector** – Specifies the category or industry within the broader sector.

My Design

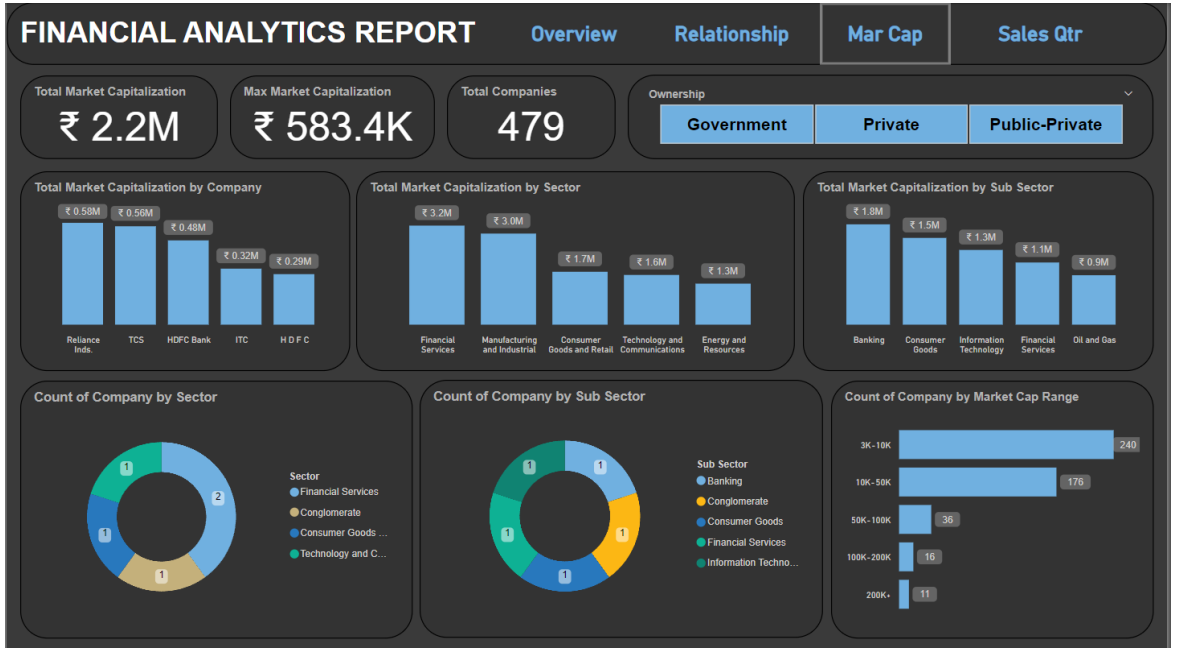


Overview

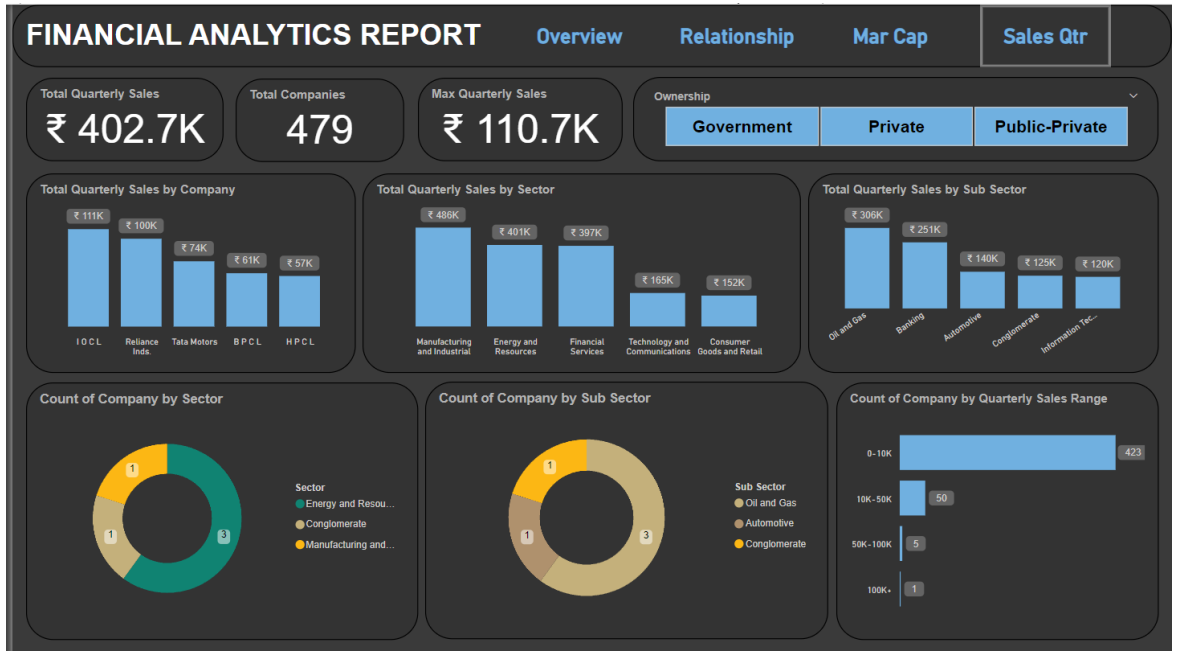


Relationship b/w Mar. cap. And Sales Qtr.

My Design (Conti.)



Market Cap. Analysis For Top 5 Company



Sales Qtr. Analysis For Top 5 Company

Key Observations

- Overall, private companies is performing well in major sectors.
- Government-owned companies dominate the Oil and Gas sector.
- The Education sector, crucial for creating human resources, is performing below average. Proper measures should be taken to develop this sector.
- The Financial sector has the highest market capitalization.
- The Manufacturing sector dominates in Quarterly Sales

Foreign Direct Investment Analytics

Introduction

Analysing historic FDI data in India from 2000-01 to 2016-17 is essential for understanding investment trends.

This dataset includes sector-wise and year-wise FDI data.

By examining key metrics and relationships, we can uncover meaningful insights to optimize investment strategies.

Details of Data

- Industry
- FDI amount ($)

Main KPIs

- **Industry** – Name of the industry
- **FDI ($)** – FDI amounts for various industries from 2000 to 2017 (Unpivoted the Year column to do further analysis)
- Further segregated Industries as follows using web surfing and Claude AI.
  - **Sector** – Specifies the major sector in which an industry operates.

Main KPIs (Conti.)

- Using DAX calculated **YoY growth (%)** = [(CurrentYFDI = PreYFDI) / PreYFDI] * 100

```
YOY Growth (%) =
VAR CurrentY = MAX('Group by Year'[Single Year])
VAR CurrentYearFDI = CALCULATE(
    MAX('Group by Year'[FDI]),
    'Group by Year'[Single Year] = CurrentY
)
VAR PreviousY = CurrentY - 1
VAR PreviousYearFDI = CALCULATE(
    MAX('Group by Year'[FDI]),
    'Group by Year'[Single Year] = PreviousY
)
RETURN
IF(
    ISBLANK(PreviousYearFDI),
    "NA",
    DIVIDE(CurrentYearFDI - PreviousYearFDI, PreviousYearFDI, 0)
)
```

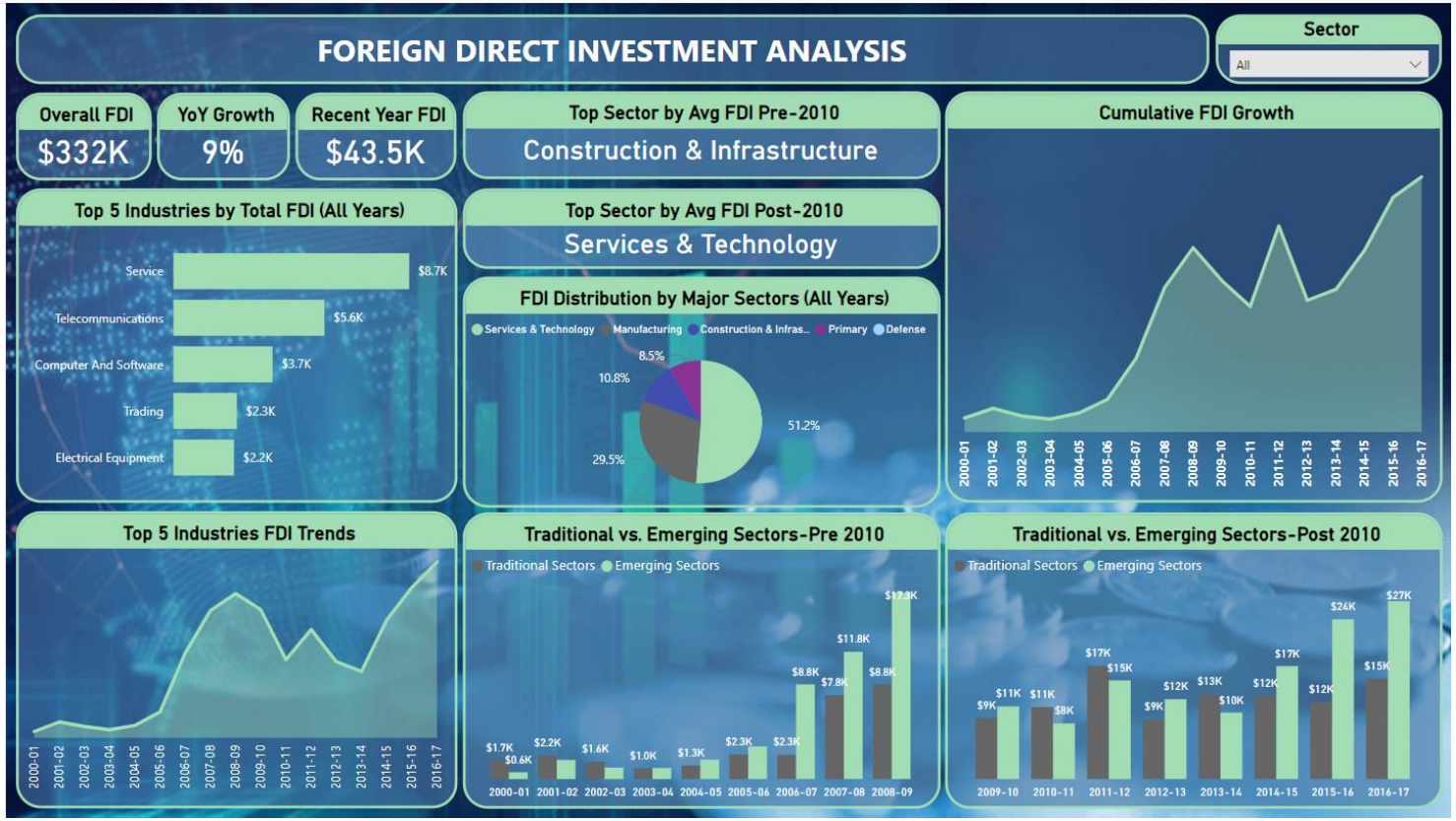
Main KPIs (Conti.)

- Segregated Manufacturing and Primary Sector as **Traditional Sectors**, Service and Defence as **Emerging Sectors** using DAX in Power BI

```
Traditional Sectors = CALCULATE(
    SUM('FDI data'[FDI]),
    'FDI data'[Sector] IN {"Manufacturing", "Primary"}
)
```

```
Emerging Sectors = CALCULATE(
    SUM('FDI data'[FDI]),
    'FDI data'[Sector] IN {"Services & Technology", "Defence"}
)
```

My Design


FOREIGN DIRECT INVESTMENT ANALYSIS
Sector
All
Overall FDI
$332K
YoY Growth
9%
Recent Year FDI
$43.5K
Top Sector by Avg FDI Pre-2010
Construction & Infrastructure
Top Sector by Avg FDI Post-2010
Services & Technology
Cumulative FDI Growth
Top 5 Industries by Total FDI (All Years)
Service
$8.7K
Telecommunications
$5.6K
Computer And Software
$3.7K
Trading
$2.3K
Electrical Equipment
$2.2K
FDI Distribution by Major Sectors (All Years)
Services & Technology
Manufacturing
Construction & Infras...
Primary
Defense
8.5%
10.8%
51.2%
29.5%
Top 5 Industries FDI Trends
Traditional vs. Emerging Sectors-Pre 2010
Traditional Sectors
Emerging Sectors
Traditional vs. Emerging Sectors-Post 2010
Traditional Sectors
Emerging Sectors

Key Observations

- Overall FDI has reached $332K, with a 9% year-over-year growth rate.
- Services & Technology has become the dominant sector for FDI post-2010, accounting for 51.2% of total FDI distribution.
- There's a clear shift from traditional to emerging sectors post-2010, with emerging sectors showing stronger growth.
- The top 5 industries by total FDI are led by Service ($8.7K), Telecommunications ($5.6K), and Computer And Software ($3.7K), indicating a strong focus on technology and services.
- The cumulative FDI growth chart shows a significant upward trend, especially in recent years, suggesting an increasingly attractive investment environment

Crop Production Analysis in India

Introduction

The agriculture sector is set to evolve significantly with advancements in the Future Internet. This paper presents a novel B2B collaboration platform for the agri-food sector, enhancing stakeholder collaboration.

This dataset includes years of crop production data in India. By analysing key metrics, we aim to predict crop production and uncover insights that highlight important indicators influencing crop yields.

Details of Data

- State Name
- District Name
- Year (1997 - 2015)
- Season
- Crop (Rice, Wheat, etc.)
- Area (ha)
- Production (MT)

Main KPIs

- **State and District Name** – Lists the states and corresponding districts in India.
- **Area (ha)**– Indicates the area (in hectares) where a crop was cultivated each season.
- **Production (MT)** – Shows the production of a particular crop per year (in metric tons).

Main KPIs (Conti.)

- Further created a calculated column named “**Region**” in Power BI and segregated the states for regional analysis

```
Region =
SWITCH(
    TRUE(),
    'Crop Production'[State_Name] IN {"Jammu & Kashmir", "Himachal Pradesh", "Punjab", "Haryana", "Delhi", "Uttar Pradesh", "Uttarakhand"}, "North",
    'Crop Production'[State_Name] IN {"Andhra Pradesh", "Karnataka", "Kerala", "Tamil Nadu", "Telangana"}, "South",
    'Crop Production'[State_Name] IN {"Gujarat", "Maharashtra", "Rajasthan", "Goa"}, "West",
    'Crop Production'[State_Name] IN {"Bihar", "Jharkhand", "Odisha", "West Bengal"}, "East",
    'Crop Production'[State_Name] IN {"Assam", "Arunachal Pradesh", "Manipur", "Meghalaya", "Mizoram", "Nagaland", "Tripura", "Sikkim"}, "Northeast",
    'Crop Production'[State_Name] IN {"Madhya Pradesh", "Chhattisgarh"}, "Central",
    "Other"
)
```

Main KPIs (Conti.)

- Handled NULL values in production (MT) column by using IF() and AVERAGEIFS() function in **MS Excel.** I named the table as crop

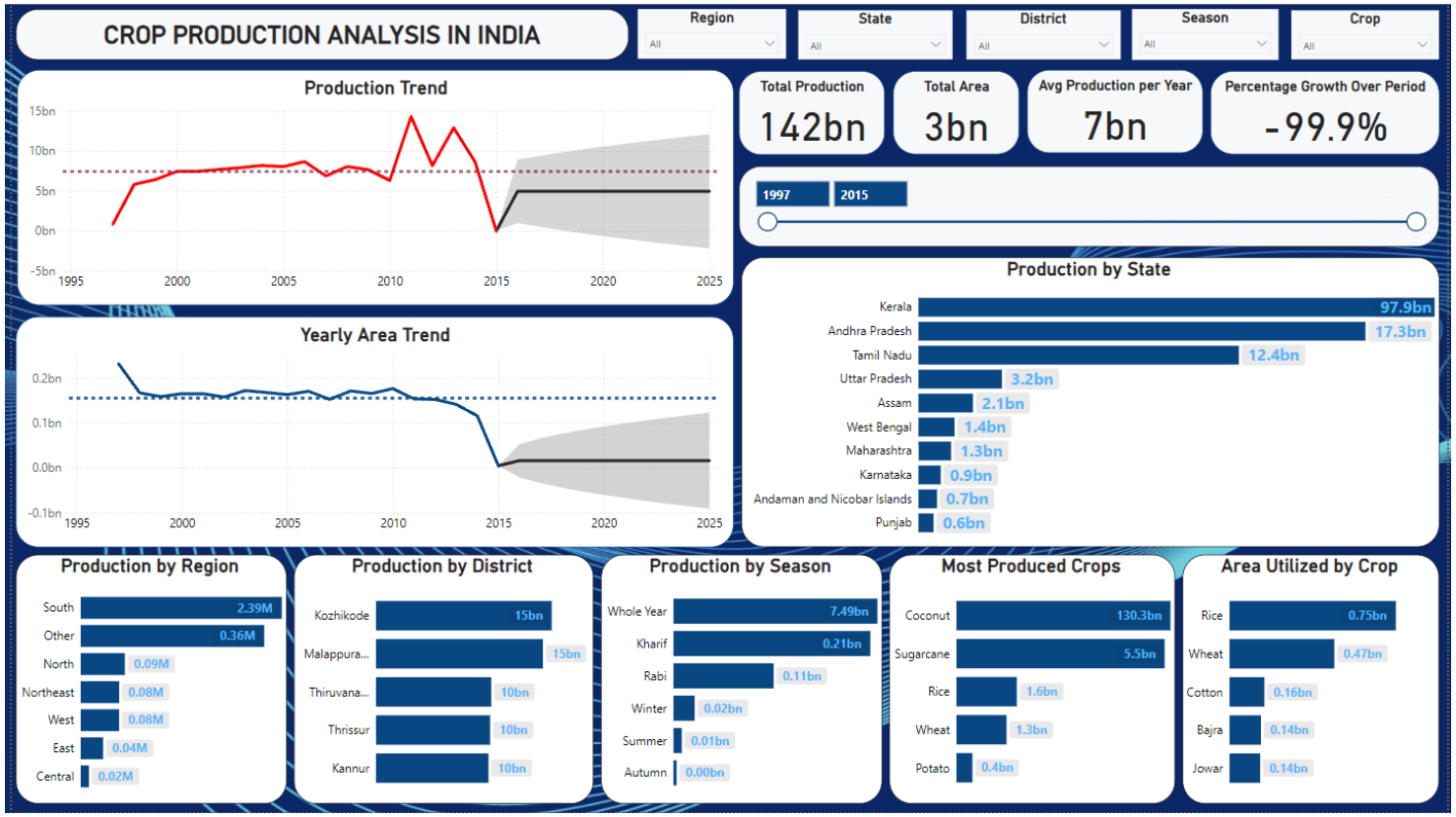
```
=IF(
    ISBLANK([@[Production (MT)]]),
    AVERAGEIFS(
        [Production (MT)],
        [State_Name], [@[State_Name]],  // Criteria: State Name
        [District_Name], [@[District_Name]],  // Criteria: District Name
        [Season], [@Season],  // Criteria: Season
        [Crop], [@Crop]  // Criteria: Crop
    ),
    [@[Production (MT)]]
)
```

Main KPIs (Conti.)

- Calculated **Production Change (%)** = [(EndYearProd – StYearProd) / StYearProd] * 100 using DAX

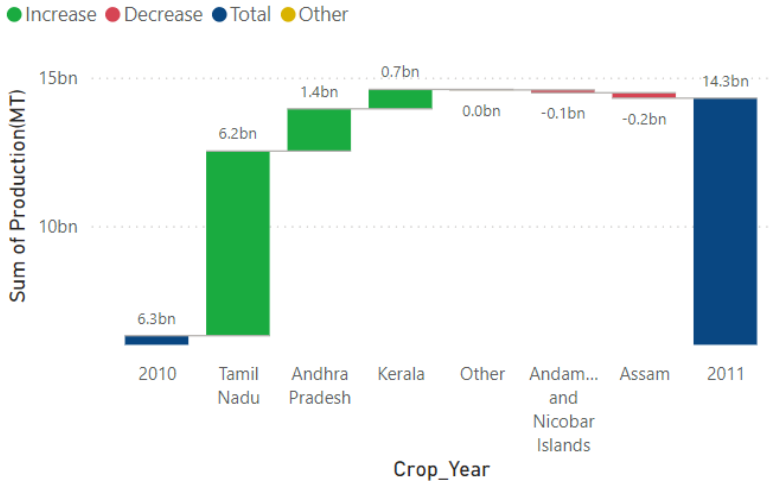
```
Production Change (%) =
VAR StartYear  = MIN('Crop Production'[Crop_Year])
VAR EndYear = MAX('Crop Production'[Crop_Year])
VAR StartYearProduction  =
    CALCULATE(
        SUM('Crop Production'[Production(MT)]),
        'Crop Production'[Crop_Year] = StartYear
    )
VAR EndYearProduction =
    CALCULATE(
        SUM('Crop Production'[Production(MT)]),
        'Crop Production'[Crop_Year] = EndYear
    )
RETURN
   IF(
        ISBLANK(StartYear),
        BLANK(),
        DIVIDE(EndYearProduction  - StartYearProduction, StartYearProduction, 0)
    )
```

My Design


CROP PRODUCTION ANALYSIS IN INDIA
Region
State
District
Season
Crop
Production Trend
Total Production
142bn
Total Area
3bn
Avg Production per Year
7bn
Percentage Growth Over Period
-99.9%
1997
2015
Yearly Area Trend
Production by State
Kerala 97.9bn
Andhra Pradesh 17.3bn
Tamil Nadu 12.4bn
Uttar Pradesh 3.2bn
Assam 2.1bn
West Bengal 1.4bn
Maharashtra 1.3bn
Karnataka 0.9bn
Andaman and Nicobar Islands 0.7bn
Punjab 0.6bn
Production by Region
South 2.39M
Other 0.36M
North 0.09M
Northeast 0.08M
West 0.08M
East 0.04M
Central 0.02M
Production by District
Kozhikode 15bn
Malappura... 15bn
Thiruvana... 10bn
Thrissur 10bn
Kannur 10bn
Production by Season
Whole Year 7.49bn
Kharif 0.21bn
Rabi 0.11bn
Winter 0.02bn
Summer 0.01bn
Autumn 0.00bn
Most Produced Crops
Coconut 130.3bn
Sugarcane 5.5bn
Rice 1.6bn
Wheat 1.3bn
Potato 0.4bn
Area Utilized by Crop
Rice 0.75bn
Wheat 0.47bn
Cotton 0.16bn
Bajra 0.14bn
Jowar 0.14bn

Summary

- **Overall Production Trends:**
  - Crop production in India showed general growth from the late 1990s to mid-2010s
  - A significant decline occurred around 2015
  - Projections suggest a recovery and stabilization in the coming years
  - In 2011, there was a sudden peak in production as TN, AP performed well



Summary (Conti.)

- **Geographic Distribution:**
  - Southern states dominate crop production, with Kerala leading by a wide margin
  - Andhra Pradesh and Tamil Nadu are also major contributors
- **Crop Patterns:**
  - Coconut is overwhelmingly the most produced crop, far exceeding others
  - Other important crops include sugarcane, rice, and wheat
  - Rice utilizes the largest area for cultivation, followed by wheat and cotton
- **Seasonal Variations:**
  - Year-round production is most significant, suggesting the importance of perennial crops
  - Kharif (monsoon) and Rabi (winter) seasons contribute to seasonal crop production

Summary (Conti.)

- **District-level Insights:**
  - Kozhikode and Malappuram in Kerala are the top producing districts
  - Other major districts include Thiruvananthapuram, Thrissur, and Kannur
- **Land Use Trends:**
  - Cultivated area remained relatively stable until 2010
  - A sharp decline in area occurred around 2015
  - Projections indicate a slight recovery and stabilization of cultivated land

Key Observations

- Kerala's dominance in production suggests a focus on high-value crops like coconut
- The importance of perennial crops is evident from both seasonal and crop-specific data
- Despite having less area under cultivation, southern states achieve higher production

Challenges and Opportunities

- The sharp decline around 2015 warrants investigation into potential causes
- Opportunity exists to apply successful strategies from southern states to other regions
- Balancing between cash crops and food crops may be an ongoing consideration

THANK YOU