Expenditure Data Analysis Project

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Objective:

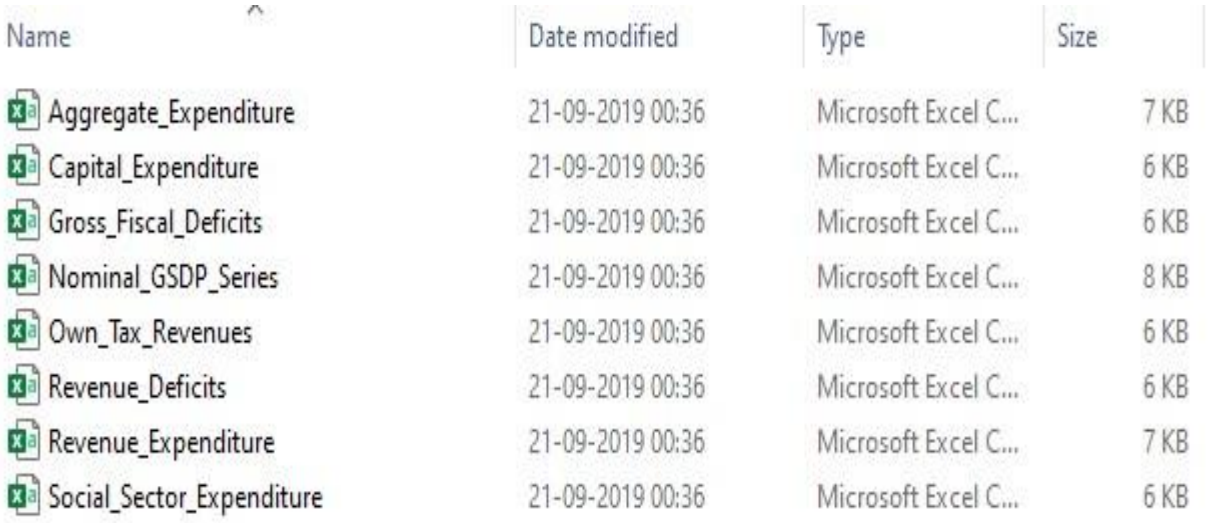
- To run government, it is important to manage expenses. It’s a way by which any government can handle its economy.
- So, in this project we are going to analyze some key features that describes, how well a state government is in managing its economy as a categories of expenditure.
- This will helps management in creating and establishing new structure and models to reduce cost , high cost s not good at all.
- For this purpose, we will get our dataset from NITI Aayog from 1980-81 to 2015-16.
- The NITI Aayog is developing itself as a state-of-the-art resource centre with the necessary knowledge and skills that will enable it to act with speed, promote research and innovation, provide strategic policy vision for the government, and deal with contingent issues.

Benefits:

- To monitor government expenses of all categories.
- To have more precise financial and annual report state wise.
- To manage cost for future allotment.
- To improve overall performance.

About Dataset:

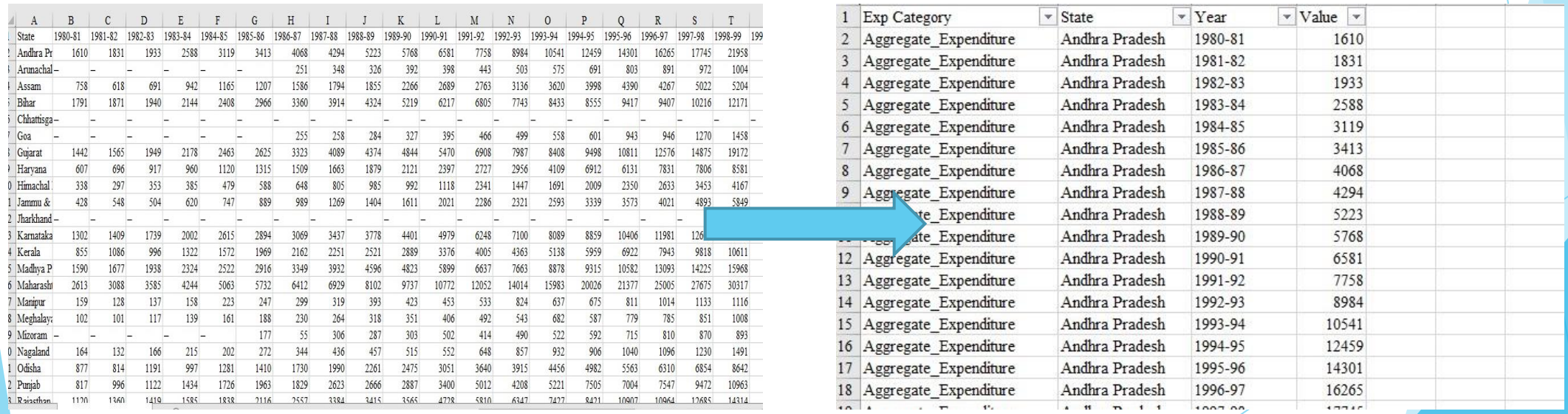
- The dataset as listed on NITI Aayog website from 1980_81 to 2015_16.
- You can find the dataset on the given link. https://www.niti.gov.in/ (https://www.niti.gov.in/)
- Over raw dataset contains 8 table as category wise



Name	Date modified	Type	Size
Aggregate_Expenditure	21-09-2019 00:36	Microsoft Excel C...	7 KB
Capital_Expenditure	21-09-2019 00:36	Microsoft Excel C...	6 KB
Gross_Fiscal_Deficits	21-09-2019 00:36	Microsoft Excel C...	6 KB
Nominal_GSDP_Series	21-09-2019 00:36	Microsoft Excel C...	8 KB
Own_Tax_Revenues	21-09-2019 00:36	Microsoft Excel C...	6 KB
Revenue_Deficits	21-09-2019 00:36	Microsoft Excel C...	6 KB
Revenue_Expenditure	21-09-2019 00:36	Microsoft Excel C...	7 KB
Social_Sector_Expenditure	21-09-2019 00:36	Microsoft Excel C...	6 KB

Data Preparation:

- In the Preparation Process, we will convert our original datasets with other necessary attributes format.
- Reconstruct the structure of the dataset.
- Unpivot it in MS excel with Power query editor.
- Cleaning dataset: Removing blanks, dashes and “p” replacing with 0.



State	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99
Andhra Pr	1610	1831	1933	2588	3119	3413	4068	4294	5223	5768	6581	7758	8984	10541	12459	14301	16265	17745	21958
Arunachal	–	–	–	–	–	–	251	348	326	392	398	443	503	575	691	803	891	972	1004
Assam	758	618	691	942	1165	1207	1586	1794	1855	2266	2689	2763	3136	3620	3998	4390	4267	5022	5204
Bihar	1791	1871	1940	2144	2408	2966	3360	3914	4324	5219	6217	6805	7743	8433	8555	9417	9407	10216	12171
Chhattisga	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Goa	–	–	–	–	–	–	255	258	284	327	395	466	499	558	601	943	946	1270	1458
Gujarat	1442	1565	1949	2178	2463	2625	3323	4089	4374	4844	5470	6908	7987	8408	9498	10811	12576	14875	19172
Haryana	607	696	917	960	1120	1315	1509	1663	1879	2121	2397	2727	2956	4109	6912	6131	7831	7806	8581
Himachal	338	297	353	385	479	588	648	805	985	992	1118	2341	1447	1691	2009	2350	2633	3453	4167
Jammu &	428	548	504	620	747	889	989	1269	1404	1611	2021	2286	2321	2593	3339	3573	4021	4893	5849
Jharkhand	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
Karnataka	1302	1409	1739	2002	2615	2894	3069	3437	3778	4401	4979	6248	7100	8089	8859	10406	11981	126	
Kerala	855	1086	996	1322	1572	1969	2162	2251	2521	2889	3376	4005	4363	5138	5959	6922	7943	9818	10611
Madhya P	1590	1677	1938	2324	2522	2916	3349	3932	4596	4823	5899	6637	7663	8878	9315	10582	13093	14225	15968
Maharasht	2613	3088	3585	4244	5063	5732	6412	6929	8102	9737	10772	12052	14014	15983	20026	21377	25005	27675	30317
Manipur	159	128	137	158	223	247	299	319	393	423	453	533	824	637	675	811	1014	1133	1116
Meghalaya	102	101	117	139	161	188	230	264	318	351	406	492	543	682	587	779	785	851	1008
Mizoram	–	–	–	–	–	177	55	306	287	303	502	414	490	522	592	715	810	870	893
Nagaland	164	132	166	215	202	272	344	436	457	515	552	648	857	932	906	1040	1096	1230	1491
Odisha	877	814	1191	997	1281	1410	1730	1990	2261	2475	3051	3640	3915	4456	4982	5563	6310	6854	8642
Punjab	817	996	1122	1434	1726	1963	1829	2623	2666	2887	3400	5012	4208	5221	7505	7004	7547	9472	10963
Rajasthan	1120	1360	1419	1585	1838	2116	2557	3384	3415	3565	4728	5810	6347	7427	8421	10907	10964	12685	14314

	Exp Category	State	Year	Value
2	Aggregate_Expenditure	Andhra Pradesh	1980-81	1610
3	Aggregate_Expenditure	Andhra Pradesh	1981-82	1831
4	Aggregate_Expenditure	Andhra Pradesh	1982-83	1933
5	Aggregate_Expenditure	Andhra Pradesh	1983-84	2588
6	Aggregate_Expenditure	Andhra Pradesh	1984-85	3119
7	Aggregate_Expenditure	Andhra Pradesh	1985-86	3413
8	Aggregate_Expenditure	Andhra Pradesh	1986-87	4068
9	Aggregate_Expenditure	Andhra Pradesh	1987-88	4294
	Aggregate_Expenditure	Andhra Pradesh	1988-89	5223
	Aggregate_Expenditure	Andhra Pradesh	1989-90	5768
12	Aggregate_Expenditure	Andhra Pradesh	1990-91	6581
13	Aggregate_Expenditure	Andhra Pradesh	1991-92	7758
14	Aggregate_Expenditure	Andhra Pradesh	1992-93	8984
15	Aggregate_Expenditure	Andhra Pradesh	1993-94	10541
16	Aggregate_Expenditure	Andhra Pradesh	1994-95	12459
17	Aggregate_Expenditure	Andhra Pradesh	1995-96	14301
18	Aggregate_Expenditure	Andhra Pradesh	1996-97	16265

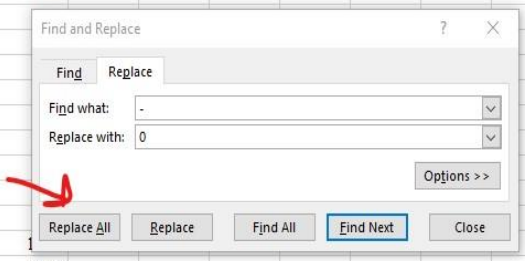
Fig: Unstructured to stricture dataset

Data Validation:

- Dataset contains blanks,'-' and 'p' replacing all with 0.

- In years column some data points have extra text. To removed using Formula "=Left (C2,7)" and apply it for whole column

xp Category	State	Year	Value
ggregate_Expenditure	Andhra Pradesh	1980-81	1610
ggregate_Expenditure	Andhra Pradesh	1981-82	1831
ggregate_Expenditure	Andhra Pradesh	1982-83	1933
ggregate_Expenditure	Andhra Pradesh	1983-84	2588
ggregate_Expenditure	Andhra Pradesh	1984-85	
ggregate_Expenditure	Andhra Pradesh	1985-86	
ggregate_Expenditure	Andhra Pradesh	1986-87	
ggregate_Expenditure	Andhra Pradesh	1987-88	
ggregate_Expenditure	Andhra Pradesh	1988-89	
ggregate_Expenditure	Andhra Pradesh	1989-90	
ggregate_Expenditure	Andhra Pradesh	1990-91	
ggregate_Expenditure	Andhra Pradesh	1991-92	
ggregate_Expenditure	Andhra Pradesh	1992-93	
ggregate_Expenditure	Andhra Pradesh	1993-94	
ggregate_Expenditure	Andhra Pradesh	1994-95	12459
ggregate_Expenditure	Andhra Pradesh	1995-96	14301
ggregate_Expenditure	Andhra Pradesh	1996-97	16265
ggregate_Expenditure	Andhra Pradesh	1997-98	17745
ggregate_Expenditure	Andhra Pradesh	1998-99	21958



Export Data from Python

Perform Exploratory Data Analysis Using Python:

1. **Import Python Modules**
2. **Load Dataset**
3. **Data Preparation**
4. **EDA: Data Visualization**

```
In [30]: #save clean profile file

         exp_clean_profile.to_file(output_file="expenditure_after_preprocessing.html")
```

Export report to file: 100% 1/1 [00:00<00:00, 8.93it/s]

```
In [31]: #save clean dataset into csv
         exp_data.to_csv('expenditure1.csv')
```

5. Data Visualization:

Data visualization is concerned with visually presenting sets of primarily quantitative raw data in a schematic form. The visual formats used in data visualization include tables, charts and graphs.

- In this project we use matplotlib and seaborn python libraries.

Fig: Extracting cleaned dataset

Architecture:

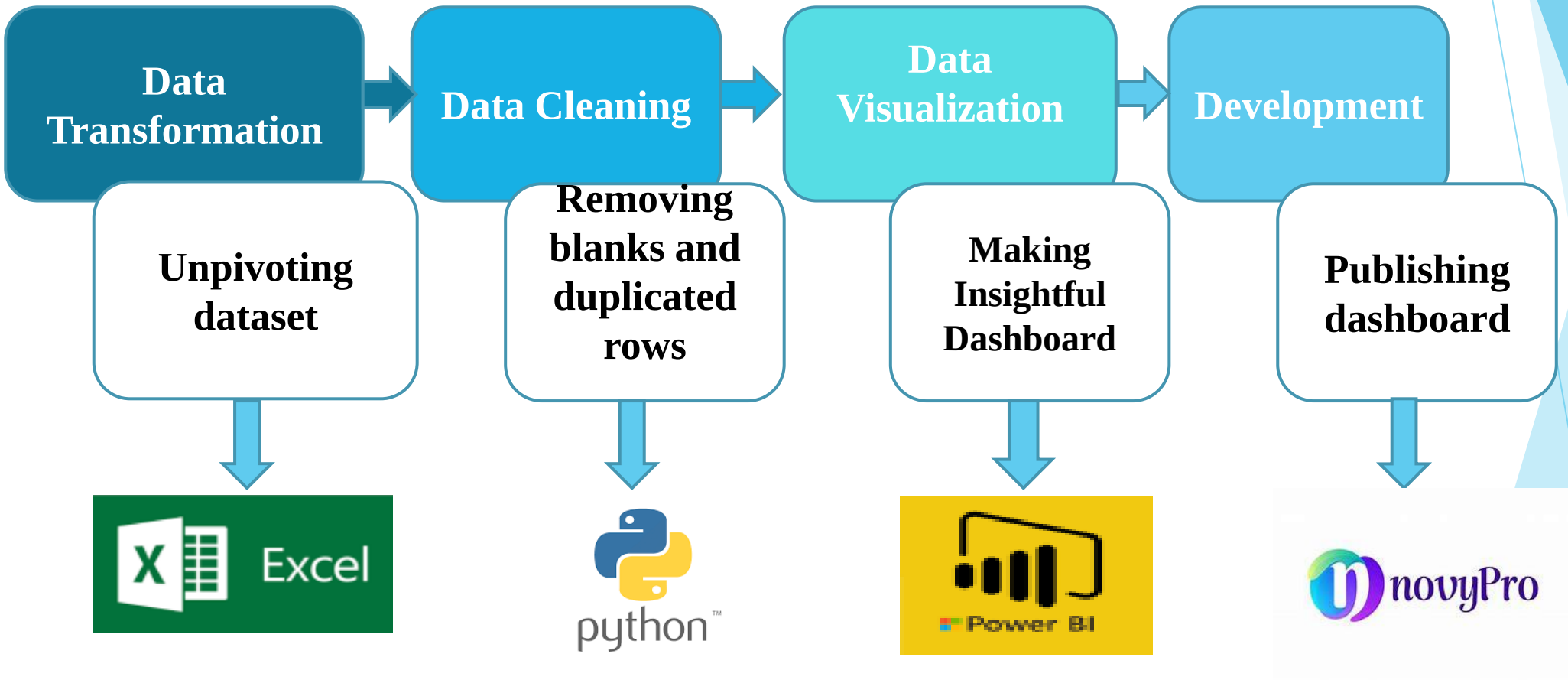


Fig: Architecture of process and tools

Development:

1. Power BI: Creating Dashboard

- Load cleaned dataset on Power BI and creates visuals for dashboard.

- After creating all visual, create insightful dashboard.

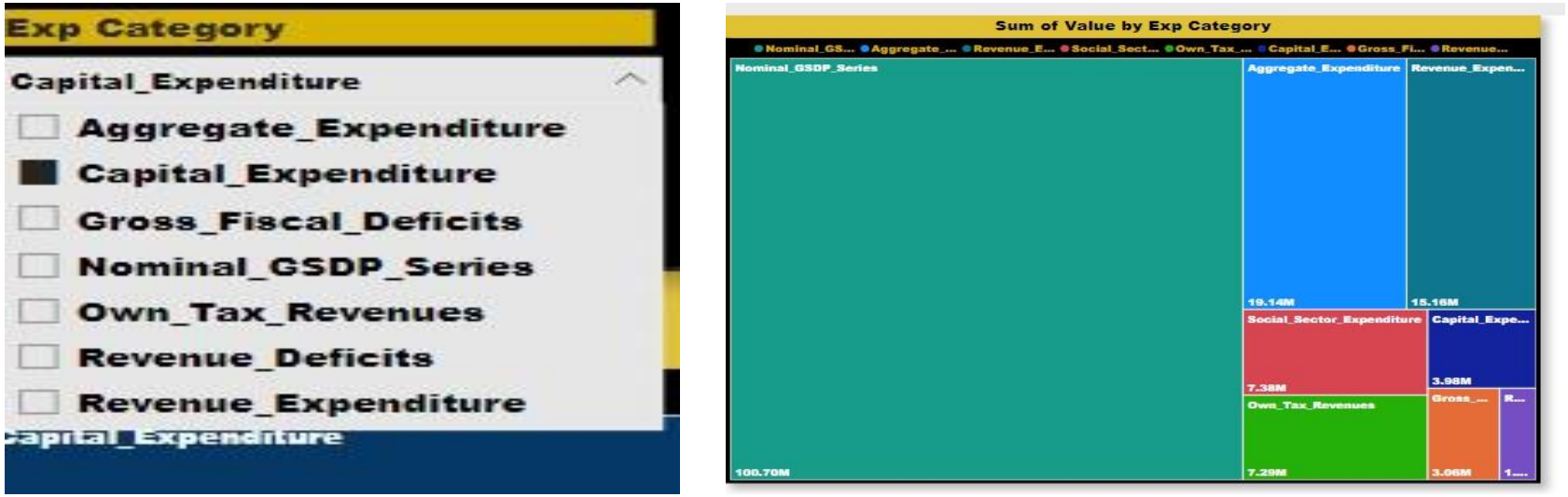
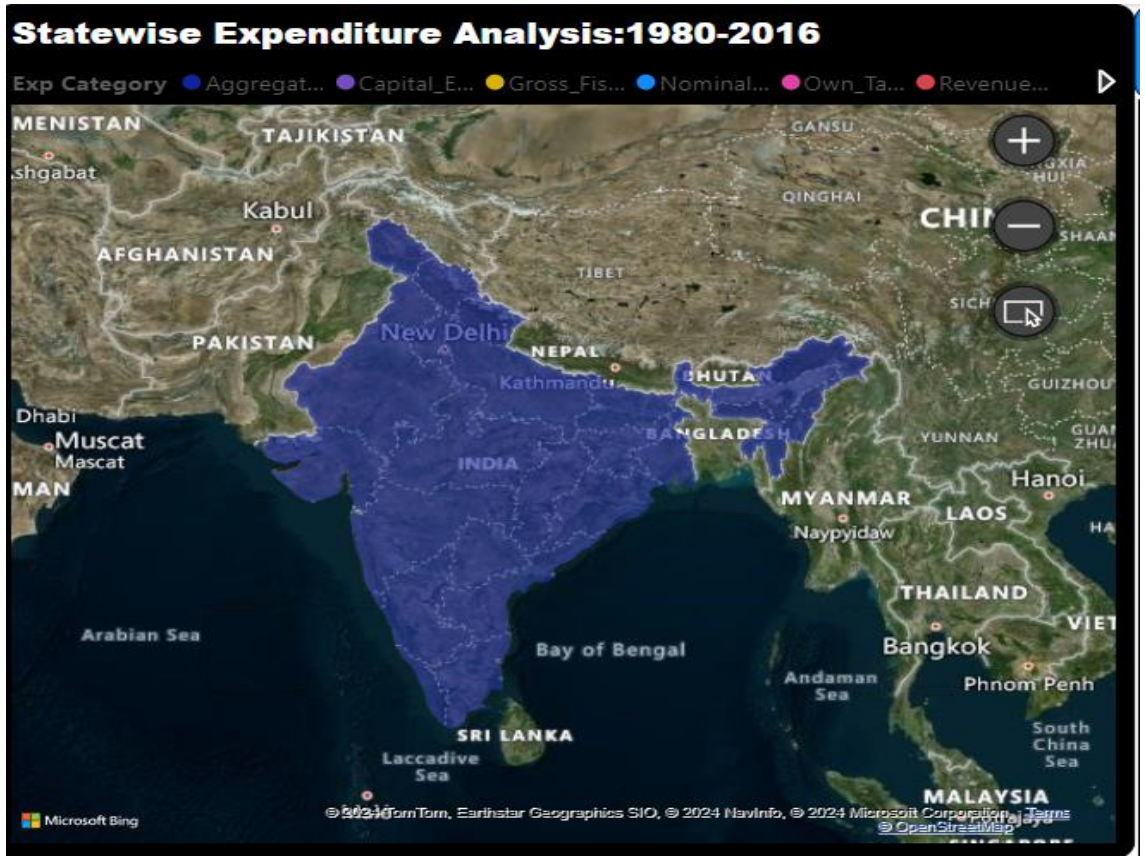


Fig: Slicer and tree map for expenditure category

Creating map for states wise analysis

- Values shown in card.
- State name and corresponding expenditure value in table



State wise and annual report in stack column charts

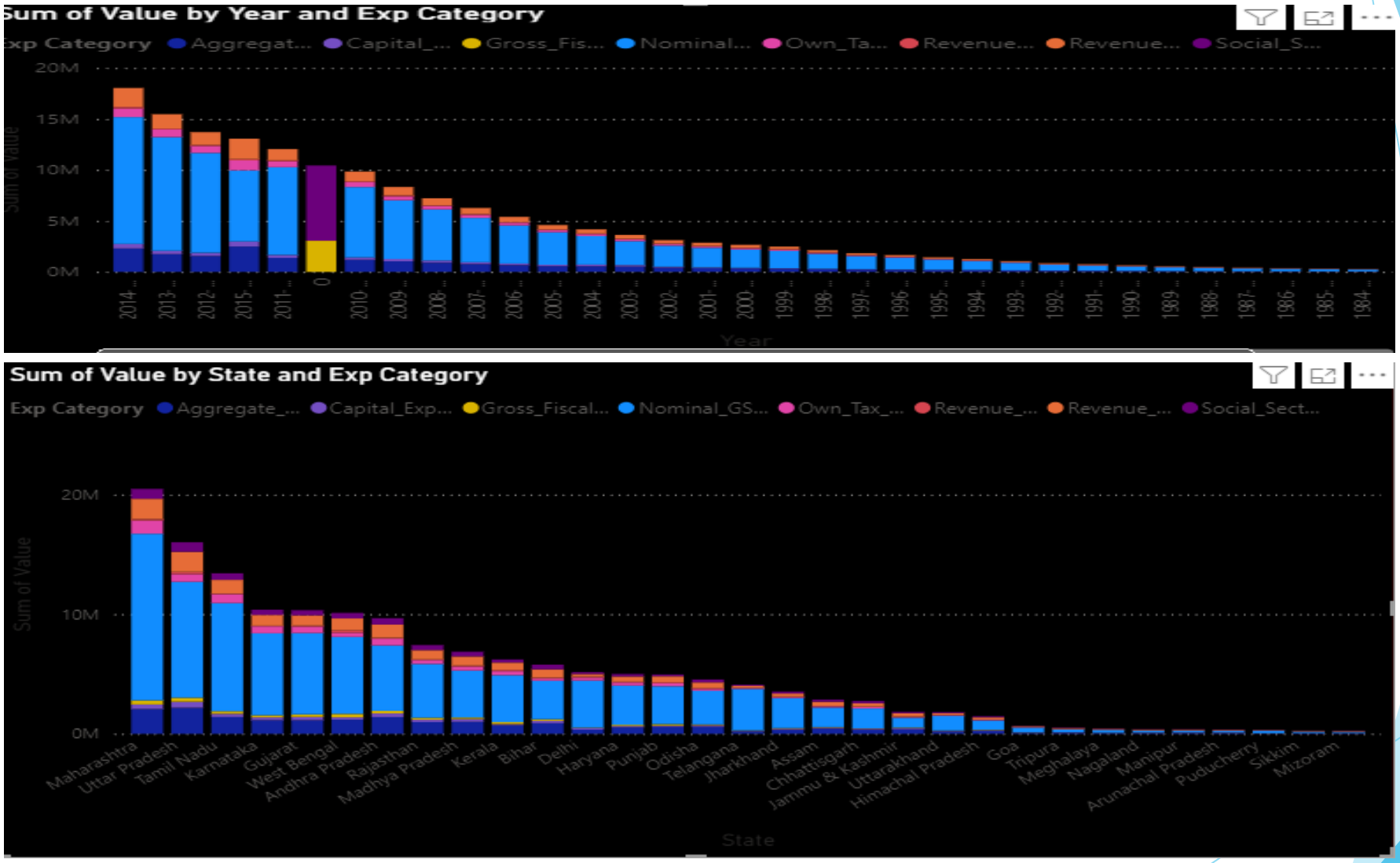
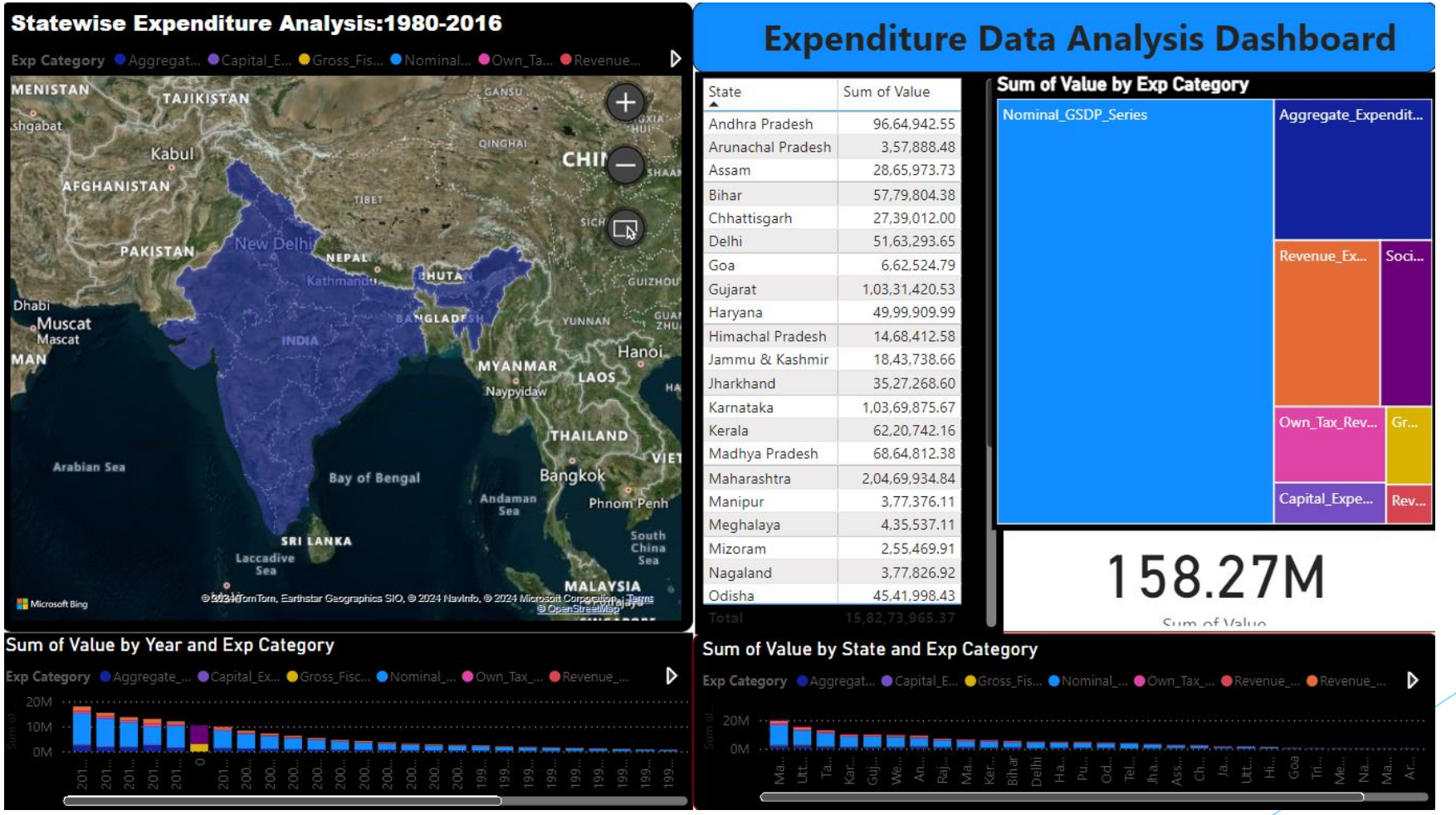


Fig: State wise and annual report in stack column charts

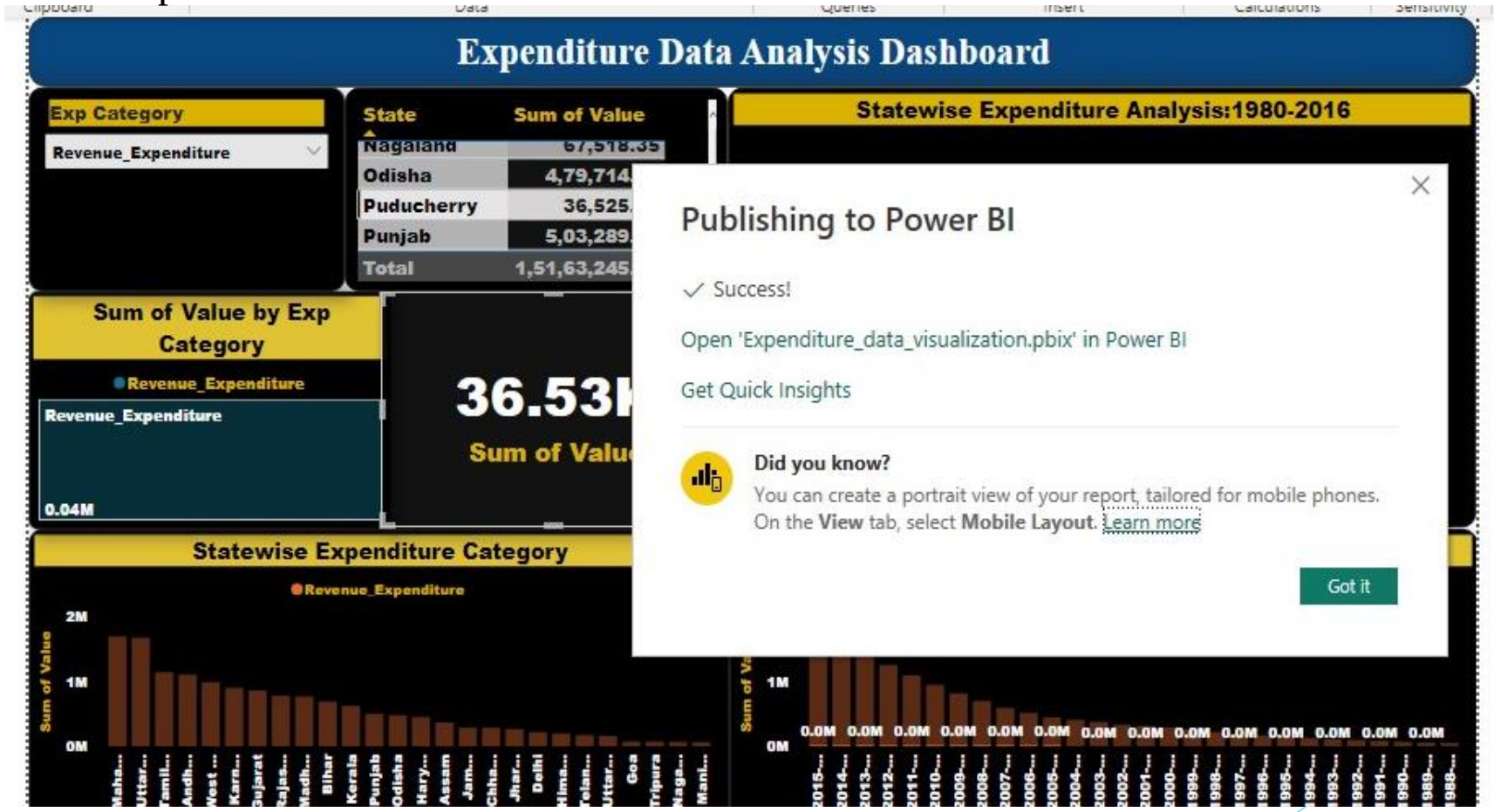
Final Dashboard:



2. Power BI Online: Publish Dashboard

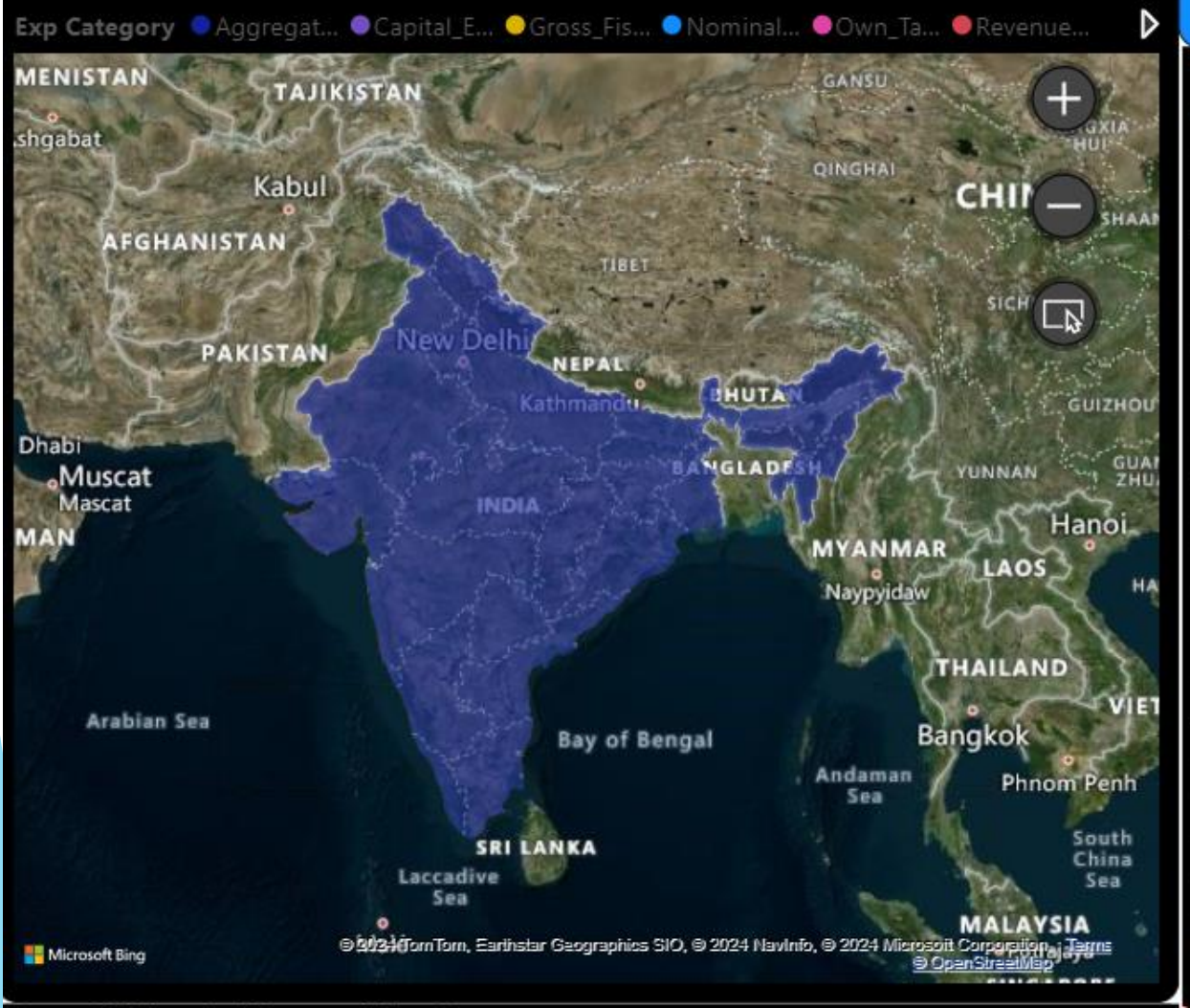
- Then Login into Power BI Service by using Microsoft developer account.

- Then create new project workspace for uploading dashboard and reports into this workspace.



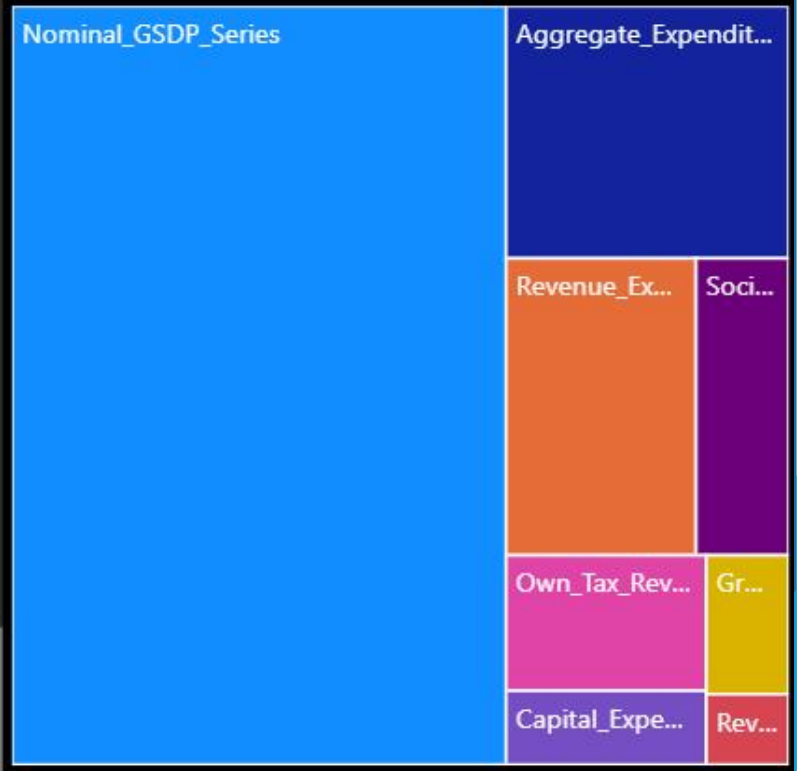
Expenditure Data Analysis Dashboard

Statewise Expenditure Analysis:1980-2016



State	Sum of Value
Andhra Pradesh	96,64,942.55
Arunachal Pradesh	3,57,888.48
Assam	28,65,973.73
Bihar	57,79,804.38
Chhattisgarh	27,39,012.00
Delhi	51,63,293.65
Goa	6,62,524.79
Gujarat	1,03,31,420.53
Haryana	49,99,909.99
Himachal Pradesh	14,68,412.58
Jammu & Kashmir	18,43,738.66
Jharkhand	35,27,268.60
Karnataka	1,03,69,875.67
Kerala	62,20,742.16
Madhya Pradesh	68,64,812.38
Maharashtra	2,04,69,934.84
Manipur	3,77,376.11
Meghalaya	4,35,537.11
Mizoram	2,55,469.91
Nagaland	3,77,826.92
Odisha	45,41,998.43
Total	15,82,73,965.37

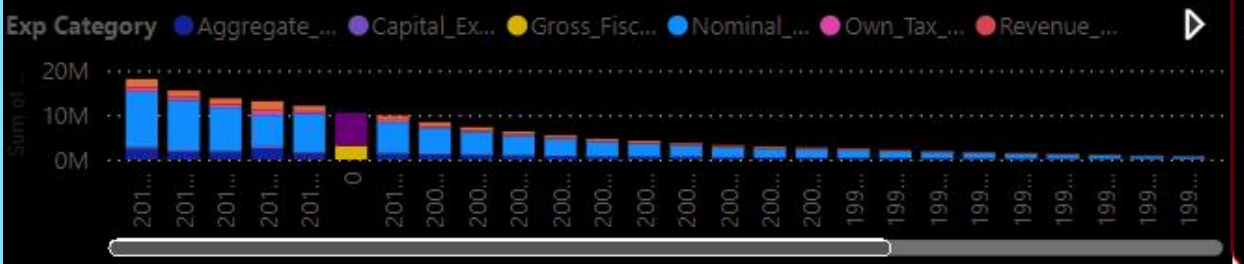
Sum of Value by Exp Category



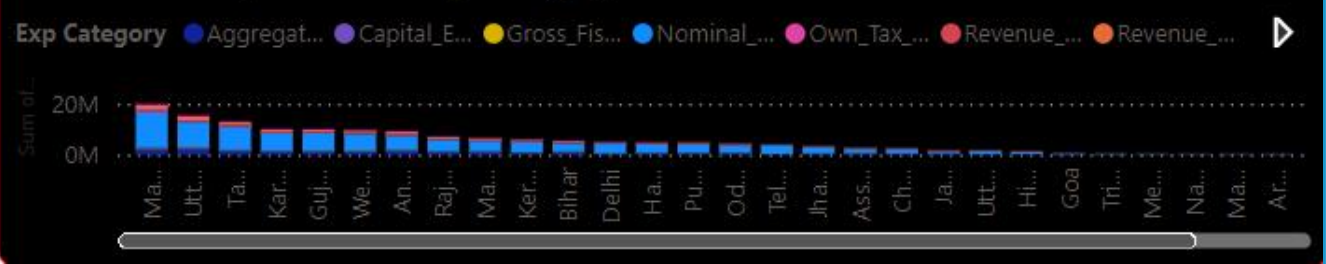
158.27M

Sum of Value

Sum of Value by Year and Exp Category



Sum of Value by State and Exp Category



Thank You!