Social Media Analysis Dashboard using Excel and Power BI

Dataset name

Social Media Engagement & Demographics Dataset

Dataset source

Uploaded CSV file: social_media_analysis.csv

Fields included

The dataset contains 11 fields:

Field Name	Description
user_id	Unique identifier for each user
country	Country of the user
gender	Gender of user
age	Age in years
likes	Total likes generated by user's posts
comments	Total comments received
shares	Number of shares
profession	User's professional background
hobby	User's personal interest
3-second-video-views	Short video views (3 sec retention)
1-minute-video-views	Long video views (1 min retention)

Problem statement:

In the digital era, social media has become one of the most powerful platforms for communication, marketing, and community engagement. Businesses, creators, and organizations rely heavily on user interactions, such as likes, comments, shares, and video views to understand audience preferences and improve their content strategies. However, analyzing large volumes of social media user data, which includes demographic variables like country, age, gender, profession, and hobbies, can be challenging without the right analytical tools.

This project aims to analyze social media engagement data using Power BI to uncover meaningful patterns and relationships between user demographics and engagement metrics. By understanding how different audience groups respond to content, brands can tailor their marketing strategies for maximum impact.

The analysis focuses on identifying:

- The most engaging audience groups based on country, age, gender, profession, and hobby
- Which professions and hobbies drive high engagement, helping companies tailor targeted content
- Short vs. long video view behavior, to understand retention and viewing preferences
- Hidden patterns that can optimize content strategy, such as age groups that prefer videos, or countries that engage more through likes and shares

By cleaning, modeling, and visualizing the dataset in Power BI, the dashboard transforms raw data into clear insights that stakeholders, such as marketing teams, content creators, and business strategists can immediately use for decision-making.

The resulting dashboard empowers users to make data-driven choices, such as selecting the best audience to target, improving content relevancy, customizing posting strategies for different demographics, and enhancing overall social media performance.

Solution using power BI:

A. Data Modelling

Since the dataset is a single flat table, a simple *Star Schema* is created by deriving dimension tables.

Dimension Tables (Created in Power Query)

1. **Dim_User**
    - user_id
    - gender
    - age
    - country
    - profession
    - hobby
2. **Dim_Demographics** *(optional)*
    - gender
    - age groups (Created using a calculated column):
    - Age Group =
    - IF([age] < 25, "18-24",
    - IF([age] < 35, "25-34",
    - IF([age] < 45, "35-44",
    - IF([age] < 60, "45-59", "60+"))))
3. **Fact_Engagement**
    - likes
    - comments
    - shares
    - 3-second-video-views
    - 1-minute-video-views
    - user_id (foreign key)

Relationships

- Dim_User[user_id] → Fact_Engagement[user_id] (1:Many)

B. Measures Created (DAX)

Total Engagement

```
Total Engagement = SUM(Fact_Engagement[likes]) +
                   SUM(Fact_Engagement[comments]) +
                   SUM(Fact_Engagement[shares])
```

Engagement Rate

```
Engagement Rate =
DIVIDE([Total Engagement],
    SUM(Fact_Engagement[3-second-video-views]))
```

Video Retention Ratio

```
Retention Ratio =
DIVIDE(SUM(Fact_Engagement[1-minute-video-views]),
    SUM(Fact_Engagement[3-second-video-views]))
```

Dashboard Visualization

An interactive dashboard was created using multiple visual elements to make the data easy to understand.

Visuals Included:

1. KPI Cards

- Total Likes

- Total Comments
- Total Shares
- Total 3-sec Views
- Total 1-min Views
- Retention Ratio

2. Bar Charts

- Likes by Country
- Comments by Age Group
- Shares by Profession
- Engagement by Gender

3. Donut / Pie Charts

- Gender distribution
- Profession distribution
- Hobby distribution

4. Line Chart

- Age vs Average Engagement
- Avg Engagement = AVERAGE(Fact_Engagement[likes] + Fact_Engagement[comments] + Fact_Engagement[shares])

5. Stacked Column Chart

- Comparison of 3-sec vs 1-min video views by country/hobby

6. Scatter Plot

- Age vs Total Engagement
- Likes vs Shares

7. Map Visualization

- Engagement by geographic country

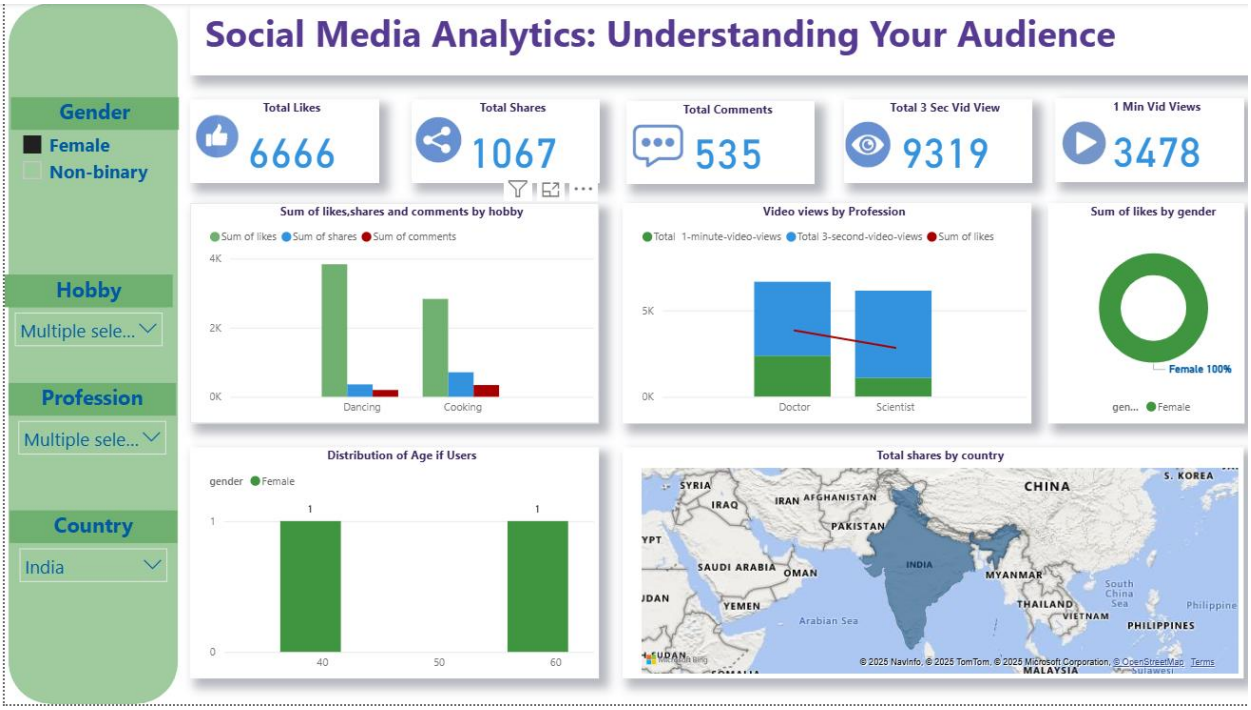
8. Slicers

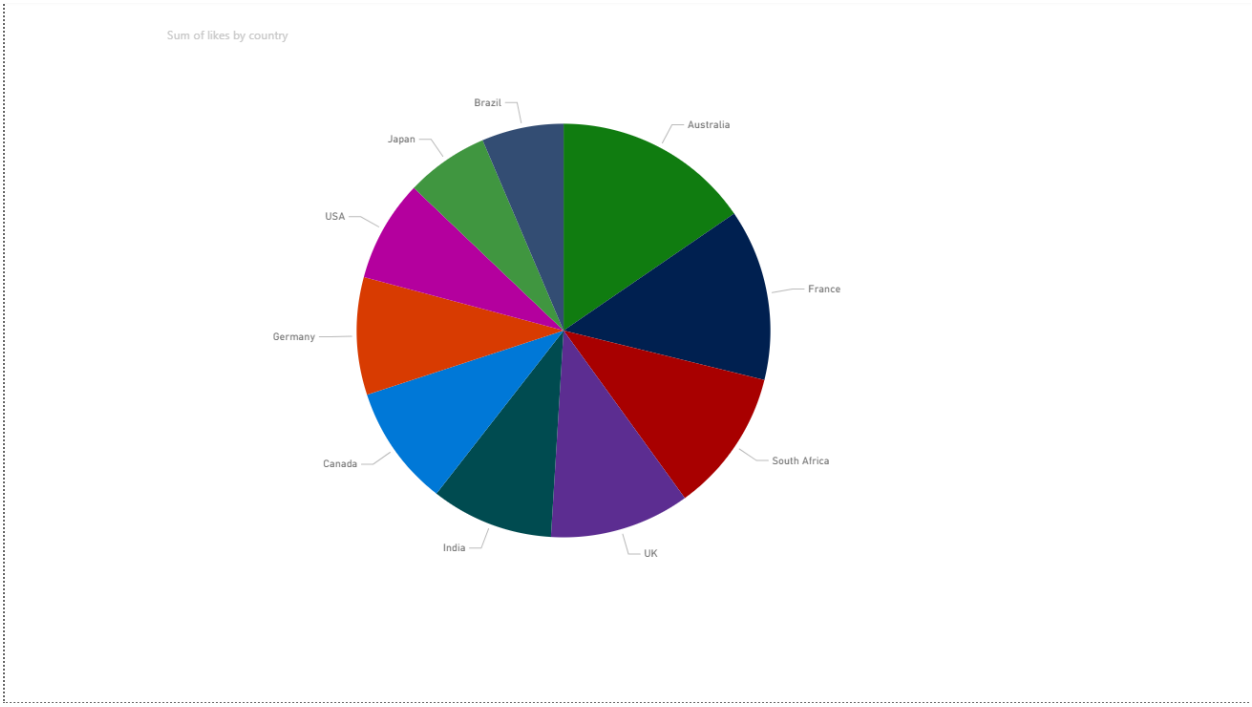
- Country
- Gender
- Age Group
- Profession
- Hobby

Final Insights the Dashboard Enables

- Identify which countries give the highest engagement
- Understand the relationship between age and interaction levels
- See which professions/hobbies engage most with content
- Compare short vs. long video viewer retention
- Provide data-driven recommendations for content strategy

Screen shot of the project:





	A	B	C	D	E	F	G	H	I	J	K
1	user_id	country	gender	age	likes	comments	shares	profession	hobby	3-second-video-views	1-minute-video-views
2	U001	Germany	Male	50	4689	640	642	Scientist	Sports	5517	3790
3	U002	South Africa	Male	60	1062	607	888	Scientist	Cycling	8682	1302
4	U003	USA	Female	57	1173	170	1664	Developer	Painting	7140	381
5	U004	India	Male	21	2649	275	78	Doctor	Gaming	4600	3593
6	U005	USA	Female	32	4321	491	1153	Designer	Sports	9520	1275
7	U006	Canada	Non-binary	60	1865	607	1313	Musician	Gaming	8108	426
8	U007	South Africa	Female	37	1415	714	248	Teacher	Cooking	5436	4696
9	U008	UK	Female	56	2216	172	1765	Developer	Reading	7980	1466
10	U009	France	Male	17	2474	653	1168	Artist	Painting	7437	1065
11	U010	Canada	Male	61	2373	321	1045	Teacher	Sports	7042	1531
12	U011	Australia	Non-binary	53	2164	510	1138	Developer	Sports	913	4690
13	U012	Brazil	Male	46	4055	442	40	Scientist	Music	6010	2203
14	U013	Germany	Non-binary	28	2347	362	1231	Artist	Gaming	2417	2071
15	U014	Australia	Male	27	396	427	1098	Teacher	Painting	4175	3008
16	U015	France	Non-binary	30	3458	760	214	Entrepreneur	Sports	4538	303
17	U016	USA	Female	63	4758	236	1700	Entrepreneur	Painting	1286	3119
18	U017	Germany	Female	35	3966	742	1078	Teacher	Music	1500	3891
19	U018	Australia	Female	61	2165	684	1695	Designer	Cycling	7023	2747
20	U019	India	Male	38	3271	27	1995	Doctor	Traveling	2760	4673
21	U020	South Africa	Female	27	1149	160	1657	Developer	Music	1094	4378
22	U021	South Africa	Non-binary	45	31	993	1150	Doctor	Cycling	8676	4345
23	U022	France	Male	60	853	263	1679	Doctor	Cooking	6995	1393
24	U023	Japan	Non-binary	62	1838	315	1239	Entrepreneur	Traveling	3923	3601
25	U024	India	Non-binary	48	3561	654	355	Musician	Sports	7911	1061
26	U025	India	Male	47	1945	545	373	Scientist	Traveling	7894	4660
27	U026	France	Female	27	270	548	39	Artist	Painting	5656	2237
28	U027	UK	Male	52	2655	245	721	Doctor	Painting	9502	3227
29	U028	India	Male	21	2073	102	927	Teacher	Gaming	4029	2901