YouTube Channel Performance and Engagement Analysis

1. Project Overview and Objective

This project analyses YouTube video performance data using **Excel** and **Power BI**. The dataset includes over 500 videos across multiple channels and categories, with metrics such as views, likes, publish date, and category ID. The objective is to clean the data and create an interactive dashboard visualization to analyse channel performance, audience engagement, and publishing trends.

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2. Data Sources

- **Source Description and Timeline:**
  The dataset consists of YouTube video statistics collected from publicly available YouTube data sources. The data spans multiple years from **2012 to 2024**, covering videos published across different timelines.

- **Domain:**
  Social Media Analytics / Digital Content Analytics

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3. Problem Statement

The rapid growth of YouTube content makes it important to understand what factors contribute to video popularity and audience engagement. This project aims to analyse YouTube video data to:

- Identify top-performing channels based on total views
- Analyse content category performance
- Understand view trends over time
- Study engagement patterns between views and likes
- Determine which categories publish more content

The analysis supports data-driven insights for content creators and digital marketers.

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4. Attribute (Column /Features) Details:

Attribute Name	Data Type	Description
Video_Title	Text	Title of the YouTube video
Channel_Name	Text	Name of the YouTube channel
Category_ID	Categorical	Content category identifier
Publish_Date	Date/Time	Date and time when the video was published
View_Count	Numeric	Total number of views per video

Like_Count	Numeric	Total number of likes per video
Publish_Year	Numeric	Year extracted from publish date

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5. Tools & Technologies

- **Microsoft Excel:**
Used for data cleaning, transformation, filtering, handling missing values, and preparing the dataset.

- **Power BI:**
Used for data modelling, DAX calculations, interactive dashboard creation, and visual analysis.

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6. Data Pre-Processing (Excel / Power Query)

Tasks Performed:

- Removed duplicate records
- Handled missing and inconsistent values
- Standardized column formats (date, numeric fields)
- Extracted publish year from publish date
- Filtered unnecessary records
- Verified data consistency across channels and categories
- Prepared cleaned dataset for Power BI import

The cleaned Excel file was used as the final dataset for Power BI analysis.

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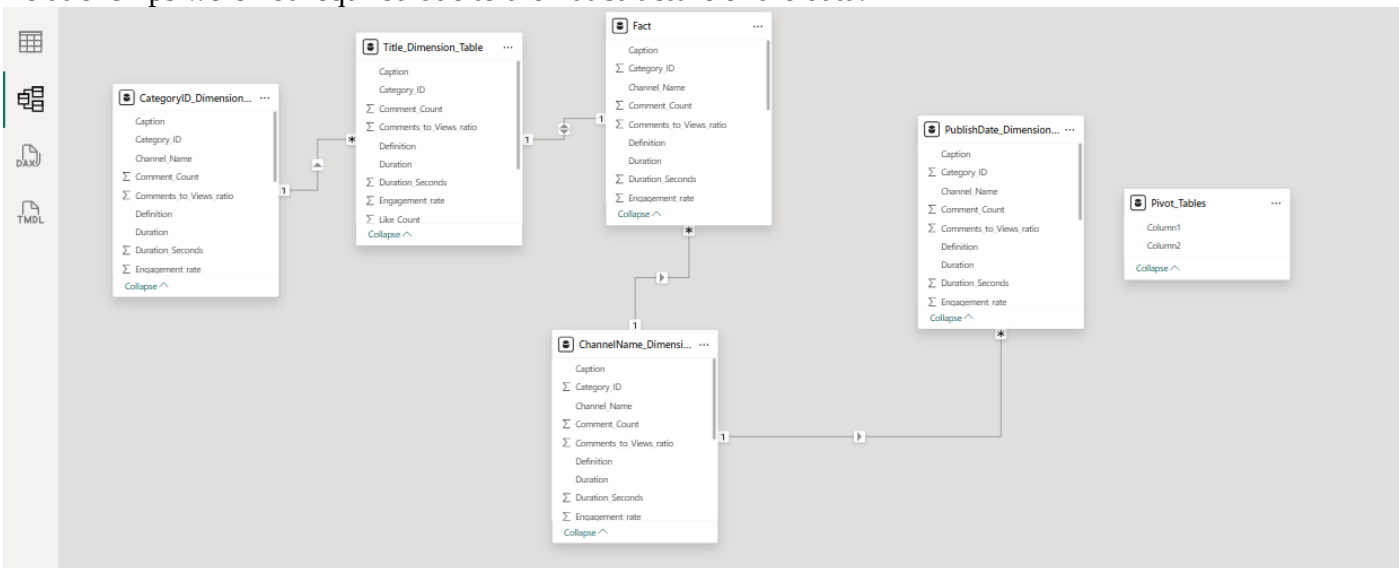
7. Data Modelling and DAX (Power BI)

Data Model:
A single-table data model was used, as all attributes belonged to the same dataset.
Relationships were not required due to the flat structure of the data.



Calculated Measures Created:

- **Total Views** = Sum of all video views
- **Total Likes** = Sum of all video likes
- **Total Videos** = Count of videos
- **Total Channels** = Distinct count of channel names
- **Like Rate (%)** = (Total Likes / Total Views) × 100

These measures dynamically update based on slicer and filter selections.

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8. Analysis and Visualizations (Power BI)

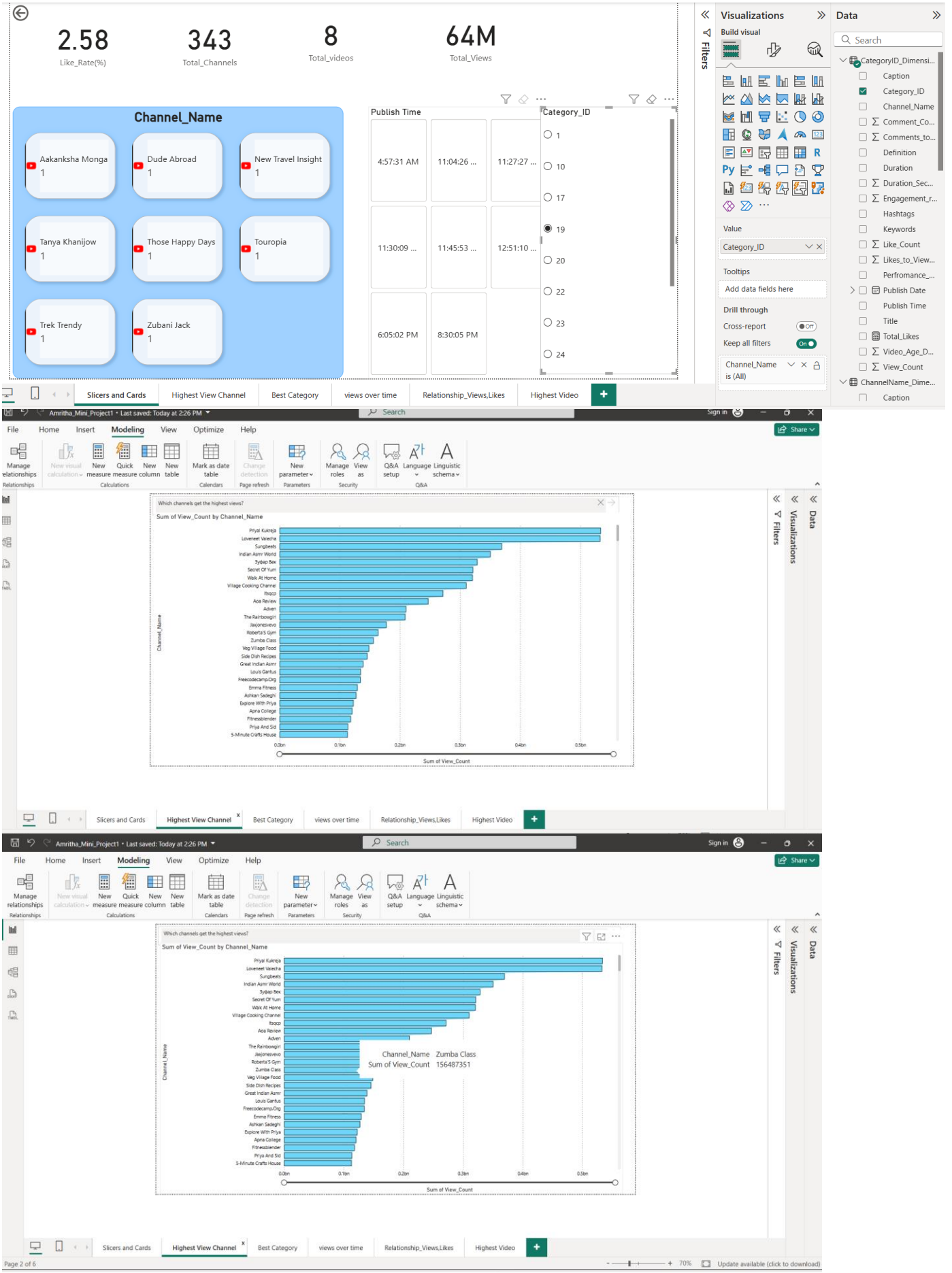
Dashboard Features and Visuals:

- KPI Cards:
  - Total Views (2 Billion)
  - Total Videos (522)
  - Total Channels (343)
  - Like Rate (%) (2.02%)
- Bar Chart:
  - Total Views by Channel Name (Top performing channels identified)
- Bar Chart:
  - Total Views by Category ID (Category performance comparison)
- Line Chart:
  - Views trend over years (2012–2024)
- Scatter Chart:
  - Relationship between Total Views and Total Likes by Channel
- Donut Chart:
  - Distribution of Total Videos by Category ID

Interactivity Features:

- Channel Name slicer
- Category ID slicer
- Publish Year slicer
- Cross-filtering enabled across all visuals
- Clear titles and labels added for each visual

A consolidated dashboard was created to present all insights on a single report page.


2.58
Like_Rate(%)
343
Total_Channels
8
Total_videos
64M
Total_Views
Channel_Name
Aakanksha Monga 1
Dude Abroad 1
New Travel Insight 1
Tanya Khanijow 1
Those Happy Days 1
Touropia 1
Trek Trendy 1
Zubani Jack 1
Publish Time
4:57:31 AM
11:04:26 ...
11:27:27 ...
11:30:09 ...
11:45:53 ...
12:51:10 ...
6:05:02 PM
8:30:05 PM
Category_ID
1
10
17
19
20
22
23
24
Visualizations
Build visual
Value
Category_ID
Tooltips
Add data fields here
Drill through
Cross-report
Keep all filters
Channel_Name is (All)
Data
Search
CategoryID_Dimensi...
Caption
Category_ID
Channel_Name
Comment_Co...
Comments_to...
Definition
Duration
Duration_Sec...
Engagement_r...
Hashtags
Keywords
Like_Count
Likes_to_View...
Perfromance_...
Publish Date
Publish Time
Title
Total_Likes
Video_Age_D...
View_Count
ChannelName_Dime...
Caption
Filters
Slicers and Cards
Highest View Channel
Best Category
views over time
Relationship_Views,Likes
Highest Video
Amritha_Mini_Project1 • Last saved: Today at 2:26 PM
Search
Sign in
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Insert
Modeling
View
Optimize
Help
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New measure
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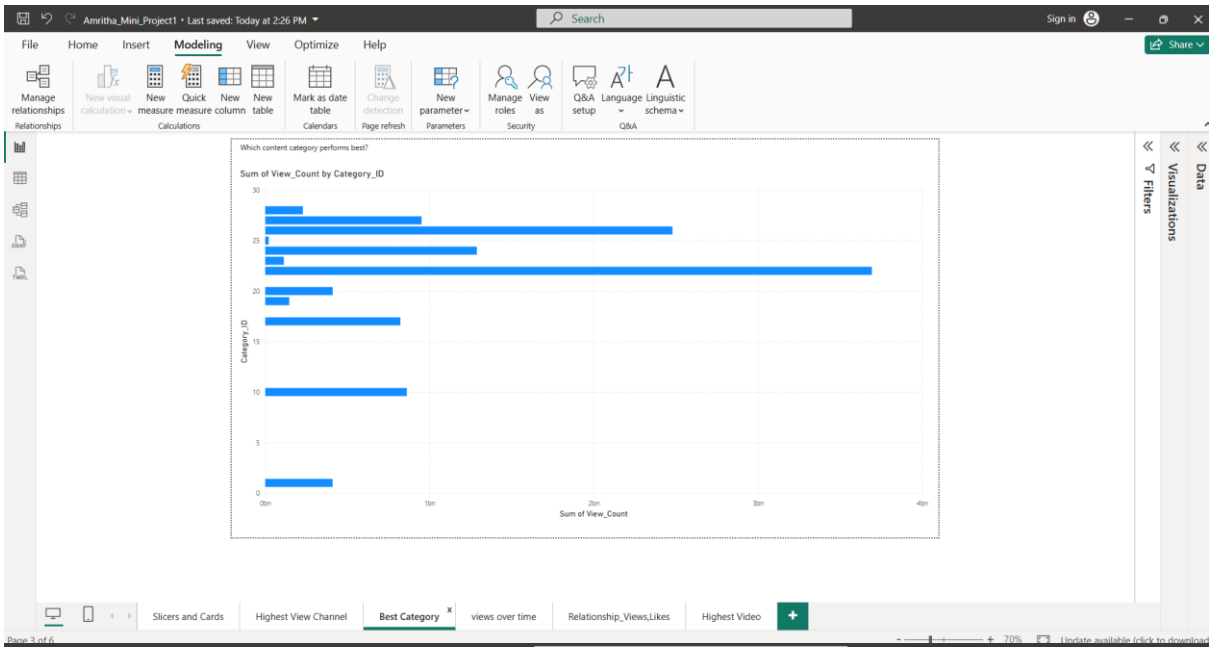
Mark as date table
New parameter
Manage roles
View as
Q&A setup
Language
Linguistic schema
Which channels get the highest views?
Sum of View_Count by Channel_Name
Channel_Name
Sum of View_Count
Channel_Name Zumba Class
Sum of View_Count 156487351
Page 2 of 6
70%
Update available (click to download)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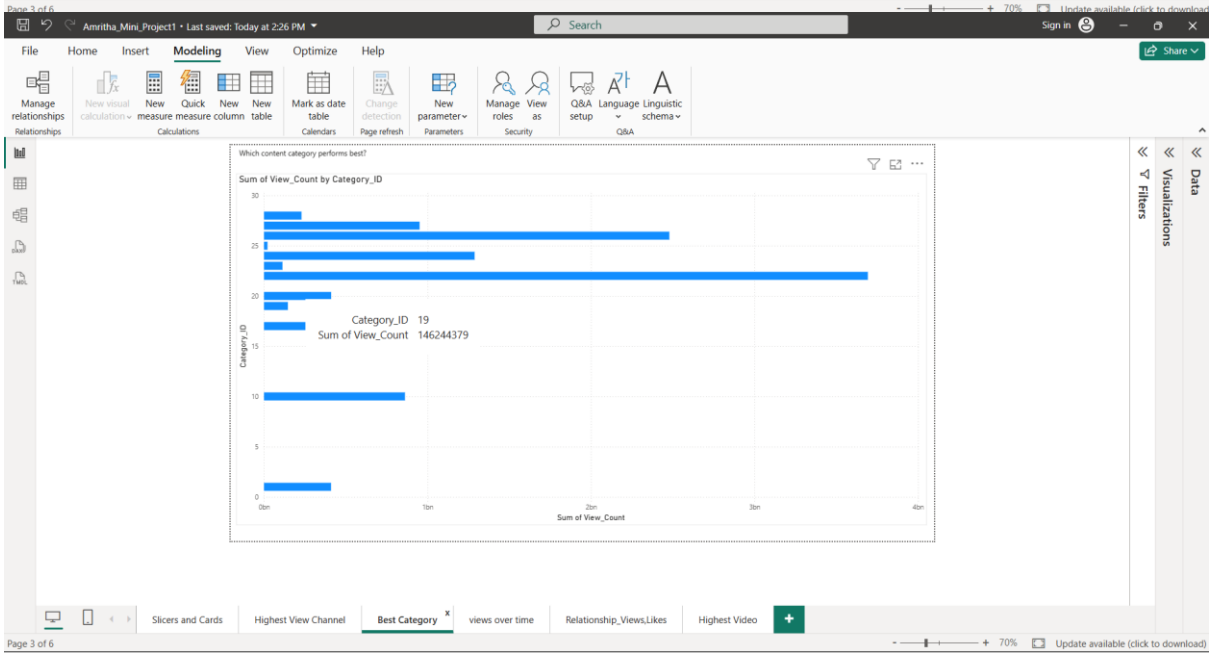
Language
Linguistic schema
Relationships
Calculations
Calendars
Page refresh
Parameters
Security
Q&A
Which content category performs best?
Sum of View_Count by Category_ID
Category_ID
Sum of View_Count
0bn
1bn
2bn
3bn
4bn
Filters
Visualizations
Data
Slicers and Cards
Highest View Channel
Best Category
views over time
Relationship_Views,Likes
Highest Video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Relationships
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Calendars
Page refresh
Parameters
Security
Q&A
Which content category performs best?
Sum of View_Count by Category_ID
Category_ID 19
Sum of View_Count 146244379
Category_ID
Sum of View_Count
0bn
1bn
2bn
3bn
4bn
Filters
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Highest Video
Page 3 of 6
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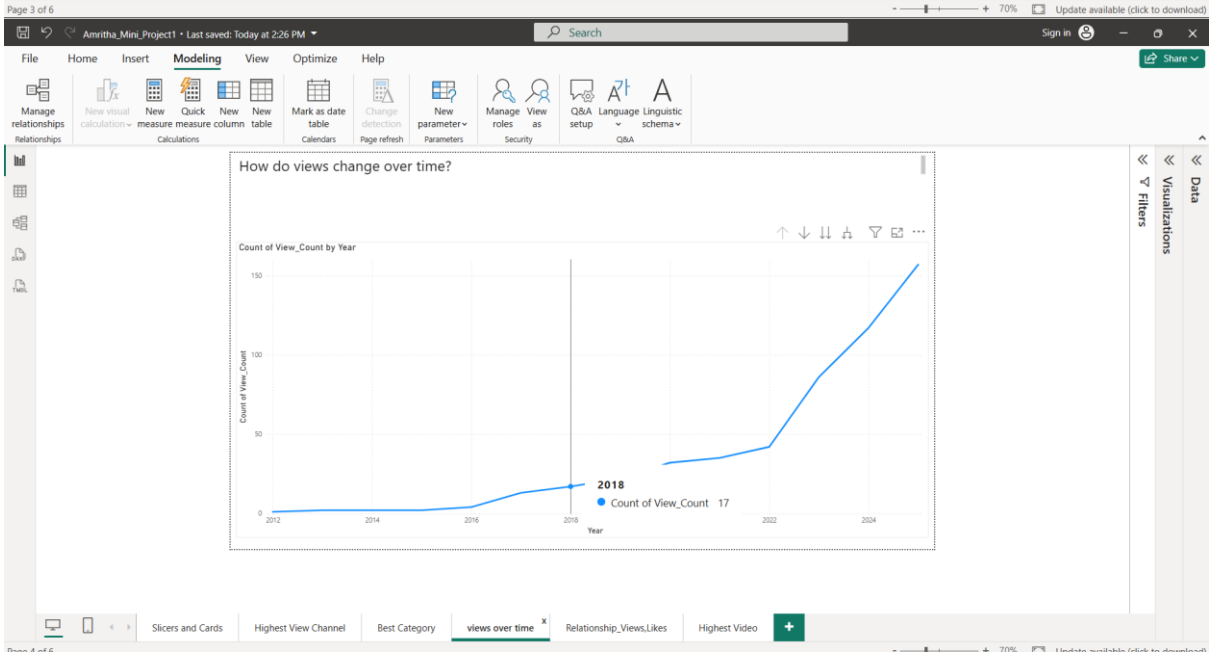
Update available (click to download)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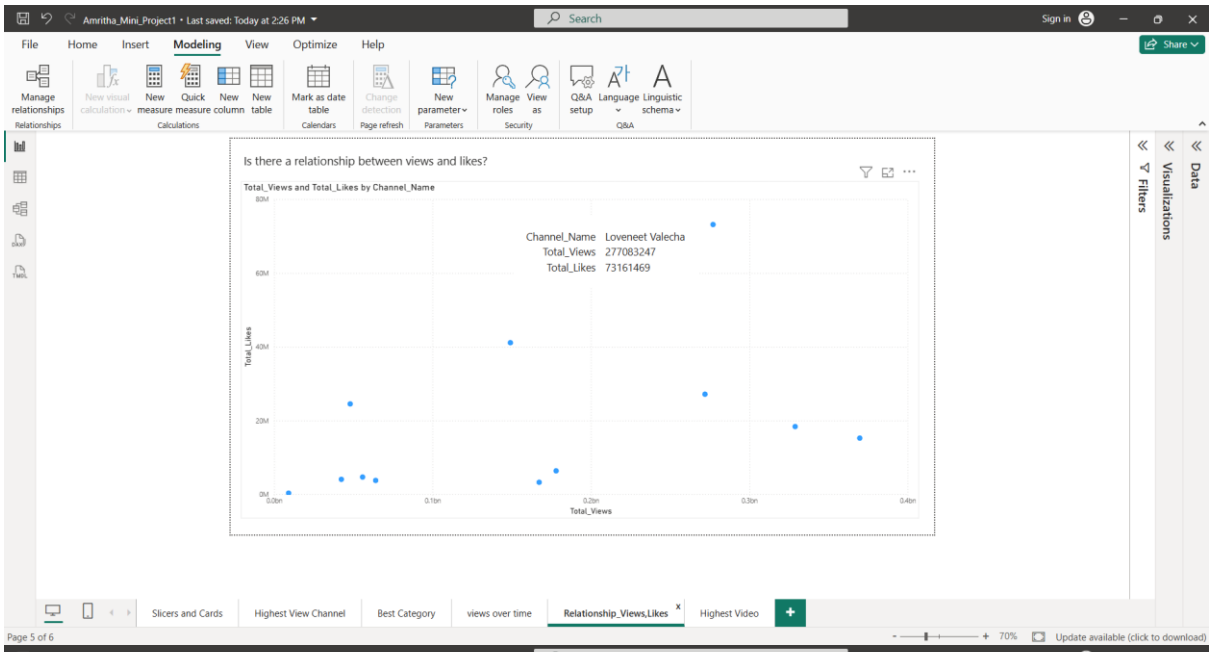
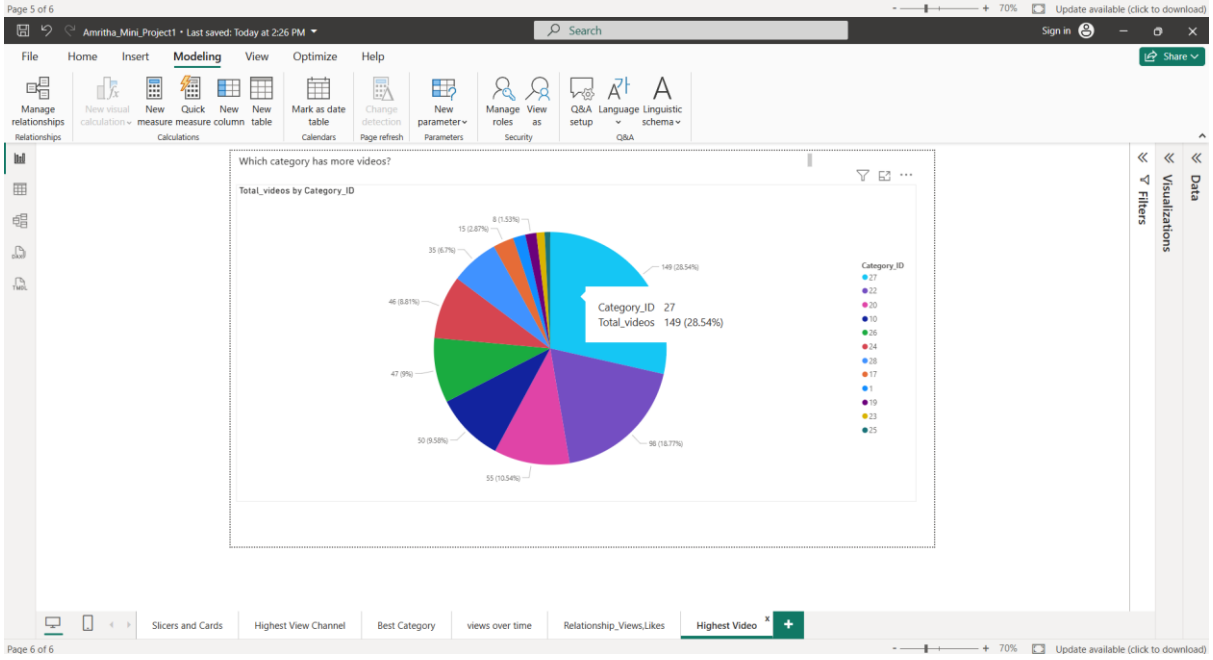
Mark as date table
Change detection
New parameter
Manage roles
View as
Q&A setup
Language
Linguistic schema
Relationships
Calculations
Calendars
Page refresh
Parameters
Security
Q&A
How do views change over time?
Count of View_Count by Year
Count of View_Count
2012
2014
2016
2018
2022
2024
Year
2018
Count of View_Count 17
Filters
Visualizations
Data
Slicers and Cards
Highest View Channel
Best Category
views over time
Relationship_Views,Likes
Highest Video





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9. Insights & Conclusions

- **Key Findings:** Summarize trends, patterns identified in the data

Descriptive Insights

- A total of **522 videos** across **343 channels** were analysed.
- The dataset recorded **2 billion total views**, indicating high audience reach.
- Certain channels significantly outperform others in terms of total views.
- Category IDs **27, 22, and 20** contain the highest number of published videos.

Diagnostic Insights

- Channels with fewer videos but high total views indicate strong content quality.
- Categories with many videos do not always generate the highest views, suggesting content relevance plays a major role.

Predictive Insights

- Video publishing activity has increased steadily after 2016.
- Channels focusing on high-engagement categories are more likely to achieve better future performance.

Prescriptive Insights

- Content creators should focus on categories with high engagement rather than high volume.
- Optimizing content strategy based on audience engagement can improve visibility and reach.
- Maintaining consistency in publishing and focusing on quality can drive better performance.

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10. Conclusions

This project demonstrates the effectiveness of combining Excel and Power BI for end-to-end data analysis. Excel was successfully used for data pre -processing, while Power BI enabled dynamic analysis and interactive visualization. The dashboard provides clear insights into YouTube channel performance, content trends, and audience engagement, supporting informed decision-making for digital content strategy.