

Business Intelligence and Data Visualization

CSL 232

Project Report



Analysis of Global YouTube Statistics Using Tableau

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Abstract

YouTube serves as a significant platform for content creation and consumption worldwide. This study analyzes global YouTube trends using Tableau, focusing on country-specific contributions, content categories, revenue patterns, and the effect of channel age on performance. The findings provide insights into the dominant contributors, the socio-economic impacts on viewership, and potential growth opportunities for emerging markets.

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1. Introduction

YouTube is a platform with over 2 billion users globally, where creators monetize their content through subscriptions, views, and advertisements. This paper analyzes a dataset containing metrics such as YouTuber count, video uploads, subscriber numbers, and revenue, emphasizing global and country-specific trends.

The goal is to:

1. Explore geographical trends in YouTube metrics.
2. Compare top contributors (countries and creators).
3. Examine the impact of content type, channel age, and socio-economic factors.

The study uses Tableau as the primary tool for data visualization and insight extraction.

2. Dataset Description

The dataset includes:

- **Core Metrics:** Number of subscribers, video views, uploads, and revenue per channel.
- **Country Data:** Geographic distribution of YouTubers and corresponding socio-economic indicators.
- **Temporal Data:** Channel creation years.
- **Content Categories:** Genre classifications and associated performance metrics.

Statistics Overview:

- **Total entries:** 1,000+
- **Top countries:** USA, India, Brazil.
- **Time span:** Channel creation dates from 2005 to 2023.
- **Content types:** Entertainment, Music, Education, Gaming, and more.

3. Methodology

This analysis used Tableau for its robust visualization capabilities. The process involved:

1. **Data Preprocessing:**

- Cleaning the dataset to handle missing values, ensuring consistency across key fields. NaN values in fields like `subscribers_for_last_30_days` and `video_views_for_the_last_30_days` were imputed using a Linear Regressor model.
- Addressing variance imbalance across countries and demographic backgrounds via undersampling to ensure a balanced representation of YouTubers.
- Optimizing memory usage by choosing the appropriate data types, which included reducing the precision of float64 columns to float32 to save space without sacrificing significant detail.
- Creating calculative fields for more complex metrics (e.g., revenue, engagement ratios) to derive meaningful insights from existing data.

2. **Visualization Design:**

- Geomaps for geographic trends to visualize YouTuber counts, subscribers, and video views by country.
- Pie charts, box plots, and treemaps for effective representation of categorical data
- Trend lines and forecasts for analyzing temporal patterns, such as channel creation and viewership trends over time.

3. **Insights Extraction:** Interpreting the visualizations to identify patterns, trends, and outliers that offer actionable insights.

4. **Storytelling:** Creating an integrated story in Tableau to present a cohesive narrative, ensuring that the findings are clearly communicated through a series of interconnected dashboards and visualizations.

4. Results and Analysis

The following section provides an in-depth analysis of the global YouTube statistics based on several key metrics, including geographical trends, country-specific contributions, content categories, revenue insights, and socio-economic impacts. Insights were derived from visualizations and comparative analysis using Tableau.

4.1 Geographical Trends

The YouTube platform displays a significant geographical divide in user engagement, with the USA, India, and Brazil standing out as key players in terms of YouTuber counts, subscribers, and video views. These countries, along with others, shape the global YouTube ecosystem.

- **USA** leads in the total number of uploads, with a vast number of content creators contributing to the platform. The growth of internet penetration and social media influence in the USA has translated into an expansive YouTube presence.
- **India** leads in subscriber counts, indicating a growing digital population and a shift toward mobile-first internet access. India's rapidly expanding internet infrastructure is contributing to YouTube's dominance, particularly in terms of mobile viewership.
- **Brazil** is characterized by steady growth in video views, which aligns with the increasing usage of mobile internet in Latin American countries. Despite not having the largest number of uploads or subscribers, Brazil has emerged as a key player in terms of video engagement.
- **Developing countries** are showing increasing engagement, largely driven by improving internet access. The rise of affordable smartphones and internet data plans is fueling this surge in video viewership and content creation.

These geographical trends highlight a clear North-South divide where developed countries dominate in content creation, while developing countries are catching up in terms of engagement, particularly with the rapid increase in mobile internet usage.

4.2 Country-Specific Contributions

A deeper analysis into the contributions of individual countries reveals the following patterns:

- **Top 3 Countries:**
 - **USA** has the highest number of uploads, indicating a well-established YouTube ecosystem where content creation is a significant part of the digital economy. The USA also leads in content monetization due to its mature advertising infrastructure and high YouTube revenue generation.
 - **India**, with its massive and growing population, has seen an exponential rise in subscriber counts. This rise is also reflective of the country's increasing smartphone penetration and mobile internet usage. The sheer volume of subscribers in India is a testament to the nation's increasing influence on global digital content consumption.
 - **Brazil** continues to show strong growth in terms of video views. While Brazil's content creator base may not be as large as that of the USA or India, the country

has witnessed a steady increase in video engagement, particularly in urban centers where internet access is more widespread.

- **Developed Nations:**
 - These contribute significantly to global revenue metrics. These countries not only have the highest number of uploads but also lead in monetized content, with high advertising revenues generated due to better digital infrastructure and viewer spending power. Developed countries benefit from more established YouTube revenue models, including ad revenues, brand partnerships, and super chat donations.

4.3 Content Categories

Content categories play a major role in determining engagement and revenue generation on YouTube. The following trends were observed based on the available data:

- **Entertainment and Music:** These two categories consistently emerge as the most viewed and monetized. Entertainment, including gaming, movies, and viral videos, captures the most attention globally. Music, in particular, sees a lot of engagement due to its universal appeal, with artists and music videos seeing millions of views per video. Both categories have become key revenue-generating areas for YouTube content creators, particularly in monetization through ad views and sponsorships.
- **Educational Content:** The rise of educational content is one of the most significant trends in recent years. This content category shows steady growth across multiple countries, with more creators focusing on knowledge-sharing, tutorials, and skill-building. Educational channels are particularly popular in countries with large youth populations like India, where users are looking for educational resources and online learning platforms. This reflects a shift toward more informative video consumption as internet access and online learning gain traction.
- **Other Categories:** There are notable but smaller contributions from content categories such as lifestyle, health, technology, and vlogs. These categories are also seeing growth, especially with the rise of micro-influencers and independent content creators.

4.4 Revenue Insights

Revenue generation is a key focus for many content creators, and several insights emerge from analyzing revenue generation patterns across countries and channel ages:

- **By Country:**
 - **USA, India, and UK** are the leading revenue-generating countries. The USA continues to lead globally, driven by high advertising spending and a mature monetization model. India, with its massive user base and increasing advertiser interest, is rapidly climbing in terms of total revenue. The **UK** has also emerged as a key revenue player due to the country's high purchasing power and advertisers' increasing investment in YouTube as a platform.
- **By Channel Age:**

- Channels in the **10-14 years** age group consistently earn the most revenue. These channels have the benefit of an established audience base, consistent content production, and high viewer retention, which makes them highly attractive to advertisers. Channels that have been around for a decade or more often have built a substantial loyal audience, making them prime candidates for consistent ad revenue streams.
- Channels that are newer (1-4 years and 5-9 years) show steady growth in revenue but are still in the process of building a substantial viewership and monetization pipeline.

4.5 Socio-Economic Impact

YouTube's content creation and viewership are not only influenced by geographical and demographic factors but also by socio-economic conditions. Key trends observed include:

- **Urban vs. Rural Populations:**
 - Urban populations contribute significantly more to video views than rural populations. The higher internet penetration, access to high-speed data, and better infrastructure in urban areas make YouTube more accessible and popular in cities. Rural areas, on the other hand, still face challenges such as limited internet access and lower smartphone penetration, which restricts engagement with the platform.
- **Socio-Economic Factors:**
 - **Education:** Countries with higher education levels tend to produce and consume more educational content. The growing interest in learning platforms and online courses has translated into a boom in educational content creation. In contrast, countries with lower education levels tend to have a higher focus on entertainment and music.
 - **Unemployment:** Unemployment also affects content creation patterns. In countries with high unemployment rates, there has been a noticeable rise in self-made content creators who turn to platforms like YouTube as a means of income. This trend highlights the democratizing nature of content creation, where anyone with internet access and a smartphone can potentially build a following and generate revenue.

These socio-economic factors also influence content consumption, with users in lower-income regions primarily consuming entertainment or viral content, while wealthier regions show a more diverse consumption pattern that includes educational, tech-related, and professional content.

5. Visualizations and Observations

5.1 Geomaps

- Used to visualize YouTuber counts, subscribers, and video views across countries.
- Observations: Developed nations exhibit higher revenue generation, while populous nations like India dominate subscriber counts.

5.2 Comparative Analysis

- Side-by-side bar charts and pie charts highlight discrepancies between top contributors (USA, India, Brazil) and others.
- Box plots reveal variations in revenue and video views among countries.

5.3 Revenue and Content Insights

- Line charts depict revenue trends across categories, while pie charts show the distribution of YouTubers across genres.
- Treemaps illustrate the dominance of entertainment and music in earnings.

6. Discussion

The analysis reveals that while developed countries dominate revenue generation, emerging markets like India and Brazil are growing rapidly in terms of subscribers and views. The steady growth in educational content suggests a shift in viewer preferences toward informative material.

The impact of channel age indicates that creators must focus on long-term audience engagement to maximize revenue. The results also highlight the potential of untapped markets with low creator densities.

7. Limitations and Future Work

Limitations:

1. **Dataset Coverage:** The dataset covers a limited sample and may not represent the entire YouTube ecosystem.
2. **Revenue Estimates:** Revenue data is estimated, introducing potential inaccuracies.

Future Work:

1. Expanding the dataset to include more countries and categories for better generalization.
2. Incorporating additional socio-economic indicators, such as GDP or internet penetration, for deeper insights.

8. Conclusion

This analysis provides a detailed understanding of global YouTube metrics, emphasizing the contributions of leading countries and categories. The study identifies opportunities for growth in emerging markets and highlights the importance of audience engagement for sustained success. These insights can aid policymakers, marketers, and content creators in shaping strategies for the platform.

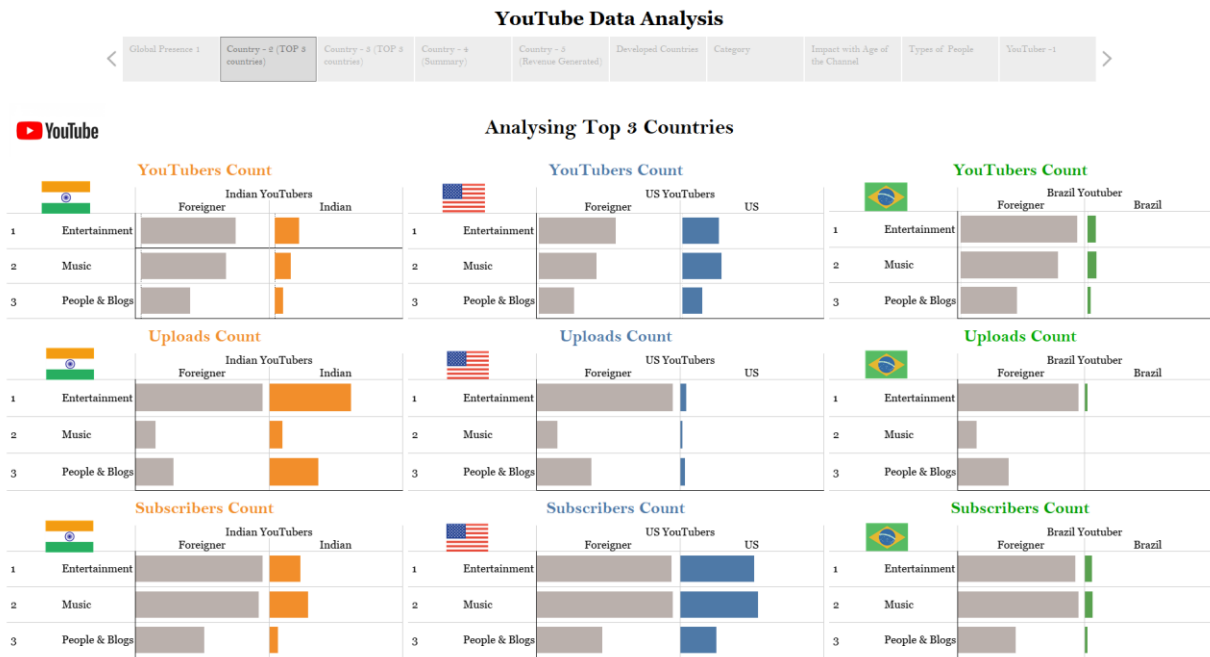
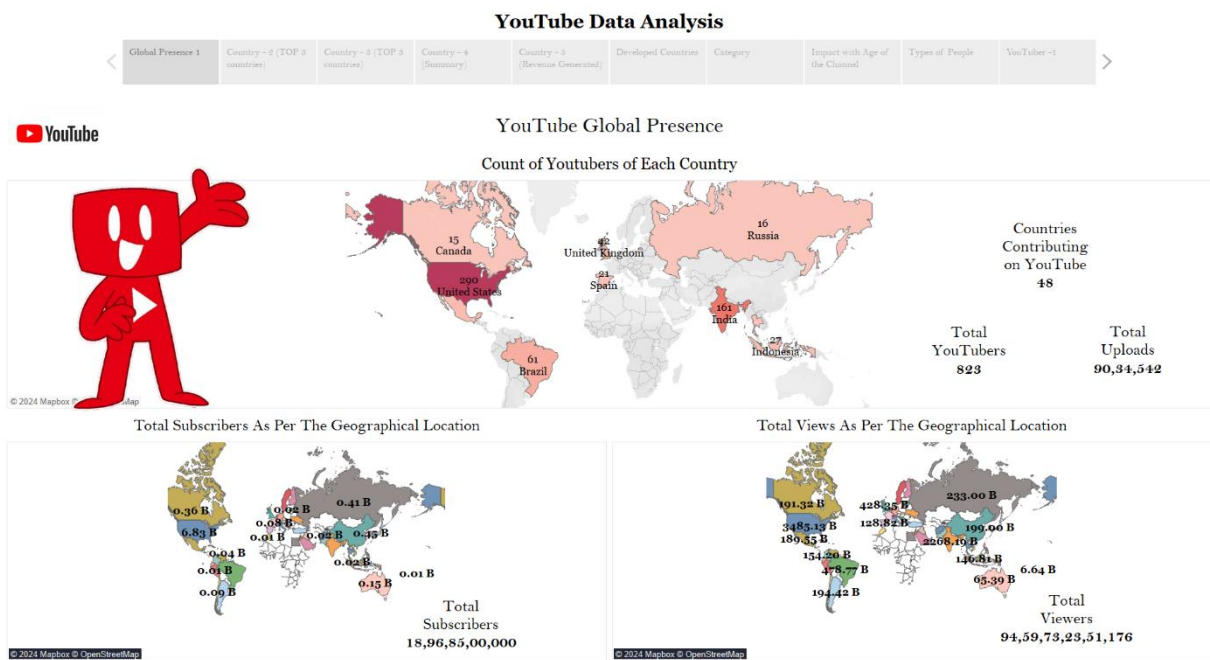
9. References

[1] YouTube Global Statistics Dataset, 2023:

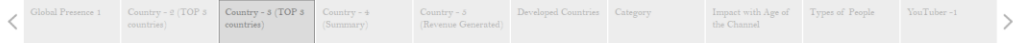
<https://www.kaggle.com/datasets/nelgiriyeewithana/global-youtube-statistics-2023>

[2] Tableau Documentation: <https://www.tableau.com/resources/reference-materials>

Appendix: Visualizations



YouTube Data Analysis

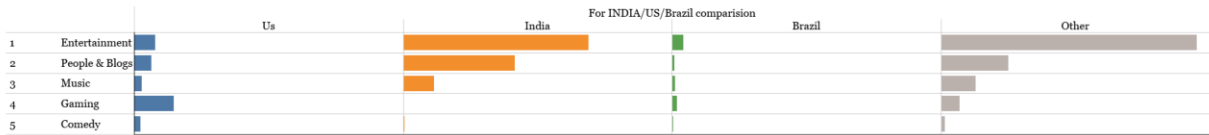


Top 3 Countries & Others Comparison

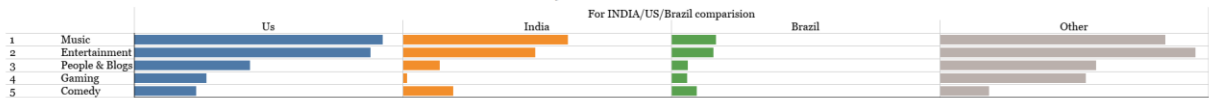
YouTubers Count Comparison



Which Country Has Much Uploads



Which Country Has How Much Subscribers



YouTube Data Analysis

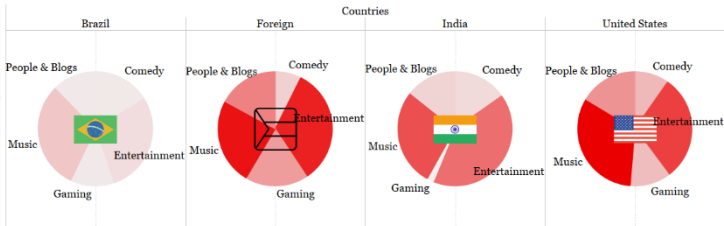


Summary of Top 3 Countries

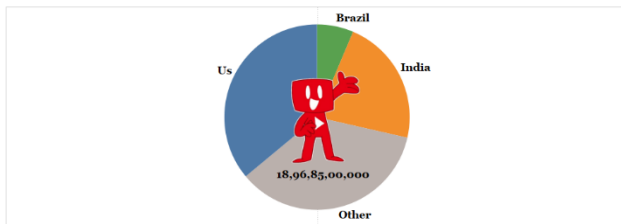
Countries Offering Maximum Subscribers



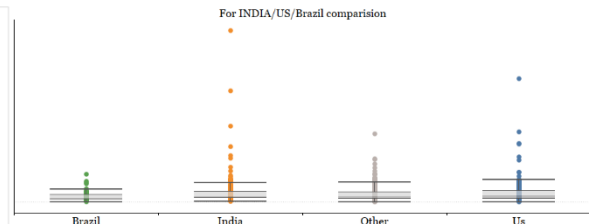
Comparison of Categories within Countries



Comparison on the Basis of Percentage of Subscribers



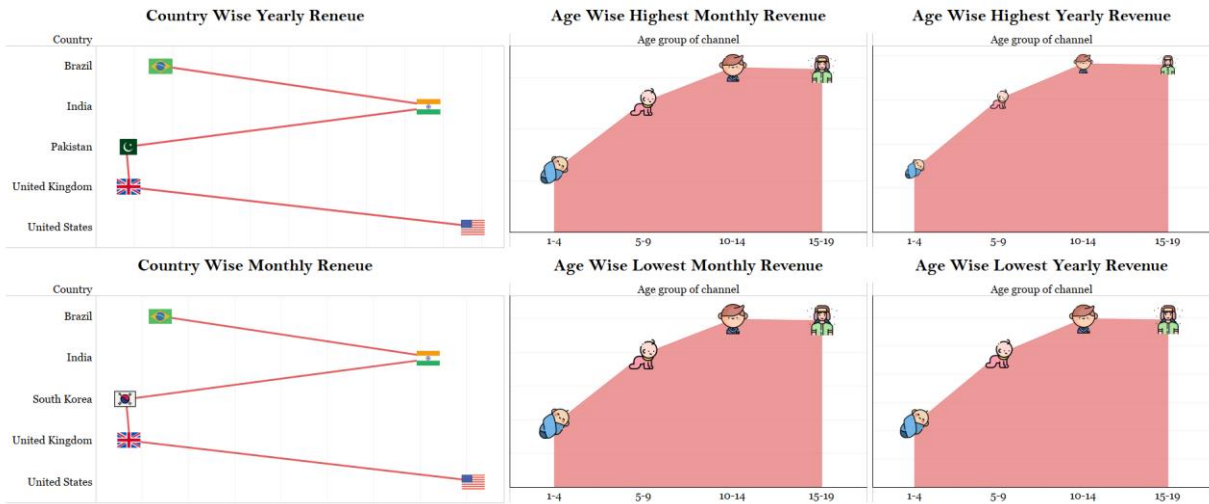
Comparison on the Basis of Viewership



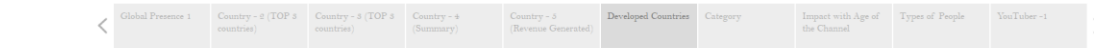
YouTube Data Analysis



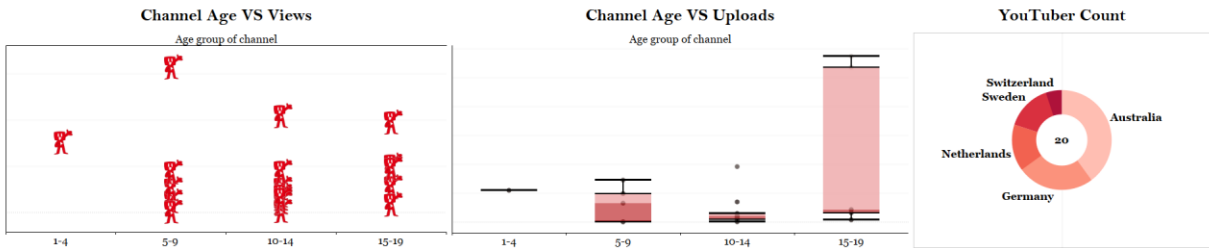
Revenue Earned



YouTube Data Analysis



Contribution of Developed Countries on Youtube



Subscribers VS Views

Tsunki Show 23.0M subscribers 295th rank 31.49 B video views	Spinnin' Records 30.1M subscribers 168th rank 19.61 B video views	Avicii 20.6M subscribers 372th rank 10.29 B video views	LazarBeam 20.5M subscribers 374th rank 8.77 B video
Bounce Patrol - Kids Songs 27.8M subscribers 192th rank 21.04 B video views	Younes Zarou 16.6M subscribers 560th rank 15.28 B video views	How Ridiculous 18.0M subscribers 479th rank 9.60 B video views	FIFA
	Jason Vlogs 17.2M subscribers 527th rank		

Global Rank VS Subscribers

RobTopGames 12.3M subscribers 374.12 M video views	Narins Beauty 14.0M subscribers 2214.17 M video views	NikkieTutorials 14.2M subscribers 1778.32 M video views	Lachlan 14.8M subscribers 5269.06 M video views	Younes Zarou 16.6M subscribers 15278.67 M video views
yyyyyy/Atro 13.8M subscribers 2480.96 M video views	Trap City 14.1M subscribers 5129.53 M video views	Beast Philanthropy 14.8M subscribers 272.68 M video views	Jason Vlogs 17.2M subscribers 8903.65 M video views	HowToBasic 17.3M subscribers 3684.82 M video views

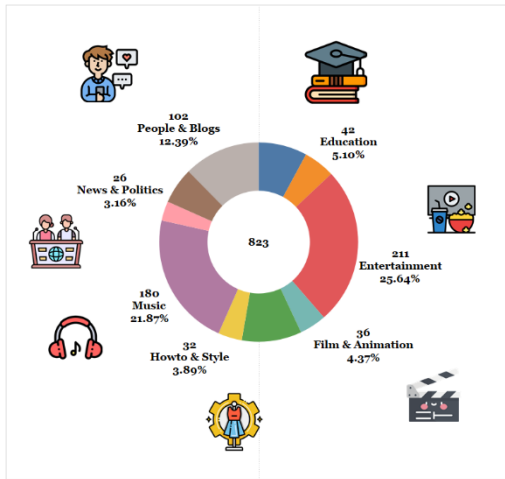
YouTube Data Analysis

<	Global Presence 1	Country - 8 (TOP 8 countries)	Country - 9 (TOP 9 countries)	Country - 4 (Summary)	Country - 5 (Revenue Generated)	Developed Countries	Category	Impact with Age of the Channel	Types of People	YouTube - 1	>
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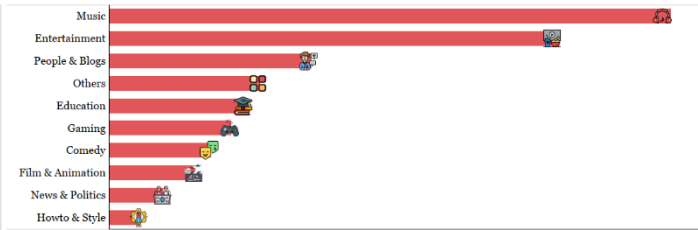


Content Categories on YouTube

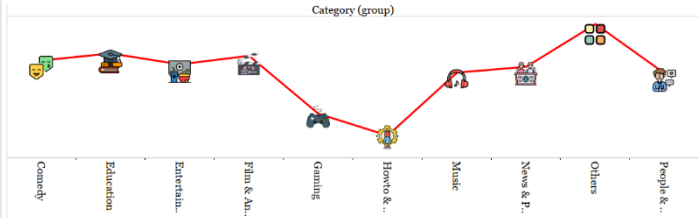
Distribution of YouTubers per Category



Category Wise Viewership



Category vs Revenue



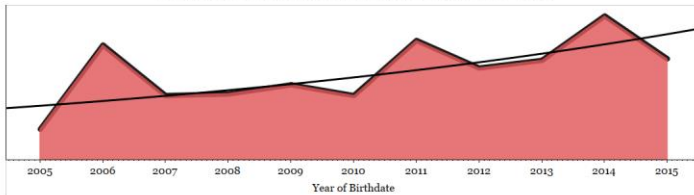
YouTube Data Analysis

<	Global Presence 1	Country - 8 (TOP 8 countries)	Country - 9 (TOP 9 countries)	Country - 4 (Summary)	Country - 5 (Revenue Generated)	Developed Countries	Category	Impact with Age of the Channel	Types of People	YouTube - 1	>
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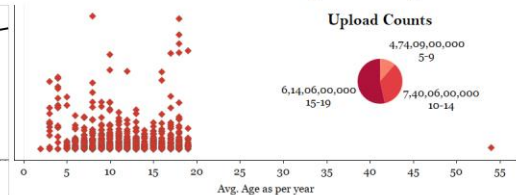


Impact of Performance with Age of Channel

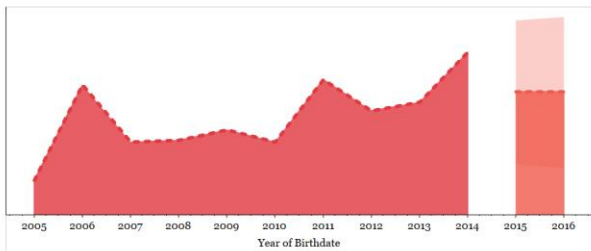
Growth of YouTubers Count Over the Course of 10 Years



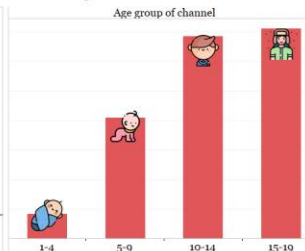
Channel Distribution with Age and Earning



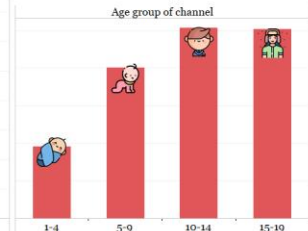
Forecast of YouTubers Count Post 10 Years



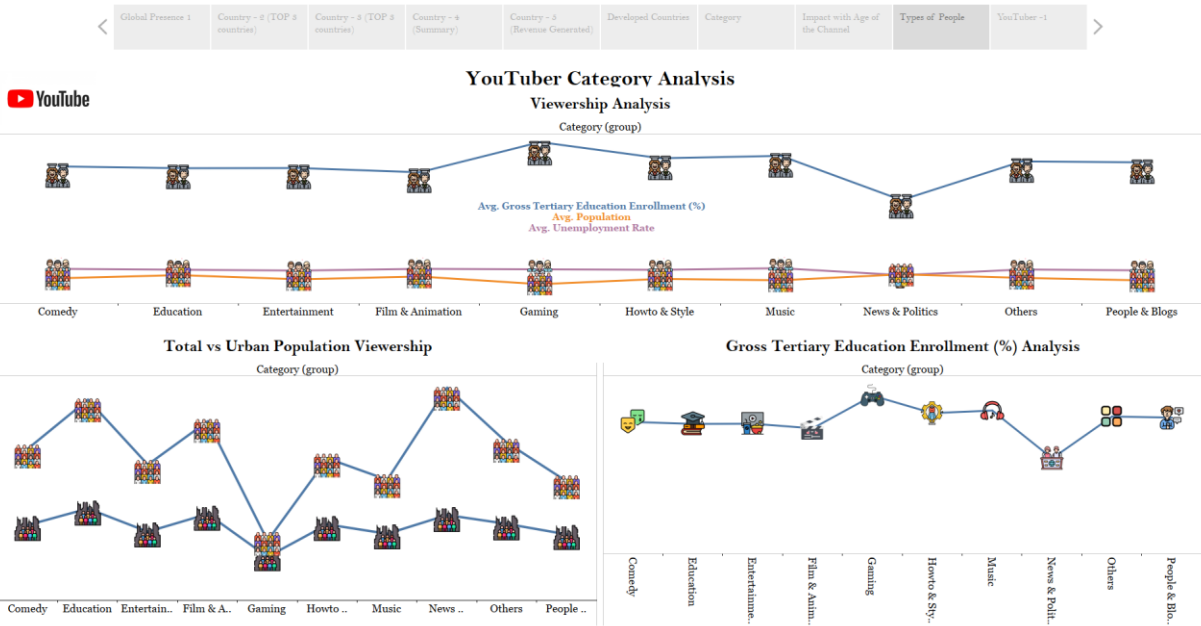
Impact on Number of Views



Earnings Associated with Respective Age Groups



YouTube Data Analysis



YouTube Data Analysis

