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Analysis of Instagram Engagement Trends

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Abstract: *Instagram has emerged as one of the most widely used social media platforms for businesses, influencers, and individuals to connect with audiences and promote digital content. Understanding user engagement trends is important for improving content strategy, increasing audience reach, and enhancing online interaction. This research paper focuses on the analysis of Instagram engagement trends using Power Bi*

The study is based on secondary data collected from publicly available Instagram datasets obtained from Kaggle. The dataset contains engagement metrics such as likes, comments, shares, saves, follower growth, post reach, impressions, hashtags, posting time, and content type. The collected data was cleaned, transformed, and analyzed using Power BI tools and visualization techniques.

Interactive dashboards and charts were created to identify engagement patterns and evaluate the impact of factors such as hashtags, captions, posting time, and media type on audience interaction. The analysis helps in understanding which types of posts generate higher engagement and how social media strategies can be optimized for better performance.

The study also demonstrates the usefulness of Power BI in social media analytics by transforming raw secondary data into meaningful insights for decision-making. The findings of this research can help content creators, influencers, marketers, and businesses improve their Instagram marketing strategies and audience engagement.

Keywords: *Instagram*

I. INTRODUCTION

Social media platforms such Instagram generate a massive amount of user interaction data every day. This data includes likes, comments, shares, saves, impressions, and follower activity, which can be analyzed to understand audience behavior and content performance. With the increasing popularity of social media marketing, analyzing engagement trends has become important for businesses, influencers, marketers, and content creators.

Instagram engagement refers to the interaction between users and social media content.

Common engagement metrics include:

- Likes
- Comments
- Shares
- Saves
- Follower growth

Analyzing engagement trends helps users:

- Improve content strategy
- Increase audience reach
- Enhance follower engagement
- Boost marketing performance

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This research paper focuses on analyzing Instagram engagement trends using Power BI. The study uses secondary data collected from publicly available Instagram datasets obtained from Kaggle Power BI is used because it provides powerful data visualization, dashboard creation, and interactive reporting features that help transform raw data into meaningful insights.

The study aims to identify patterns in user engagement based on factors such as posting time, hashtags, captions, and content type. The findings of this research can help improve social media strategies and support better decision-making in digital marketing.

Objectives of Study

The main objectives of this research are:

- To analyze Instagram engagement metrics
- To identify trends in likes, comments, and shares
- To study the impact of hashtags and posting time
- To visualize data using Power BI dashboards
- To provide insights for better social media strategy

Literature Review

Many researchers have studied Instagram engagement and the factors that influence user interaction on social media platforms. With the rapid growth of social media marketing, understanding audience behavior has become an important area of research.

According to Nakia Mishnick and Dawn Woo (2024), social media campaigns on platforms such as Facebook, Instagram, and LinkedIn significantly improve audience engagement and online interaction. Their study highlighted that engagement metrics such as likes, comments, and shares are important indicators of campaign performance and audience response.

A study by Henriikka Ryhänen (2019) analyzed Instagram posts and consumer engagement and found that hashtags, captions, and visual content strongly influence audience interaction. The research concluded that posts with relevant hashtags and attractive visual elements tend to receive higher engagement.

Another study conducted by Amandeep Singh, Malka N Halgamuge, and Beulah Moses (2019) focused on analyzing demographic and behavior trends using social media platforms such as Facebook, Twitter, and Instagram. The study emphasized that social media data can be effectively used to understand user behavior patterns, engagement trends, and audience interests through data analysis techniques.

Several researchers have also emphasized the importance of engagement metrics such as likes, comments, shares, and saves in evaluating content performance. These metrics help identify which types of posts generate more audience interaction and visibility.

Some studies highlight that posting time and content type play a major role in engagement levels. Posts uploaded during peak activity hours generally receive higher visibility and interaction. Additionally, visual content such as images, reels, and videos tends to attract greater audience attention.

Researchers have further suggested that data visualization and analytics tools help in understanding engagement patterns more effectively. Interactive dashboards, charts, and reports simplify large datasets and support better decision-making in digital marketing.

While many studies analyze large-scale datasets, this research focuses on analyzing

Instagram engagement trends using secondary data collected from publicly available datasets. The study uses Power BI for data visualization and dashboard creation to identify engagement patterns and audience interaction trends.

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Methodology

This project follows these steps:

Data Collection

Data collected from Instagram datasets (Kaggle)

- Includes:
- Likes
- Comments
- Followers
- Post type

Data Cleaning

- Remove missing values
- Format data properly
- Convert date/time

Data Transformation

- Create calculated columns
- Group data by time and category

Data Visualization (Power BI)

Use charts like:

- Bar charts
- Line charts
- Pie charts

Create dashboards for analysis

Power BI helps transform raw data into meaningful insights

Data Analysis

The analysis focuses on:

Engagement Rate

Formula:

$$\text{Engagement Rate} = \frac{Likes + Comments + Shares}{Total\ Followers} \times 100$$

Engagement rate measures how actively users interact with Instagram posts. Higher engagement indicates better audience interaction and content performance.

Overall Instagram Performance Analysis

To understand the overall performance of Instagram engagement metrics, a Power BI dashboard was created using likes, comments, shares, followers, and content category data. The dashboard provides a visual summary of audience interaction and content performance.

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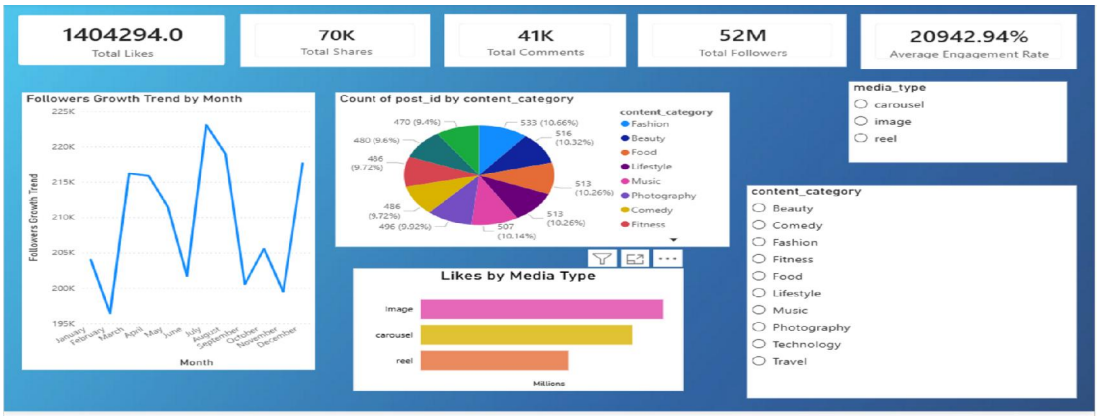


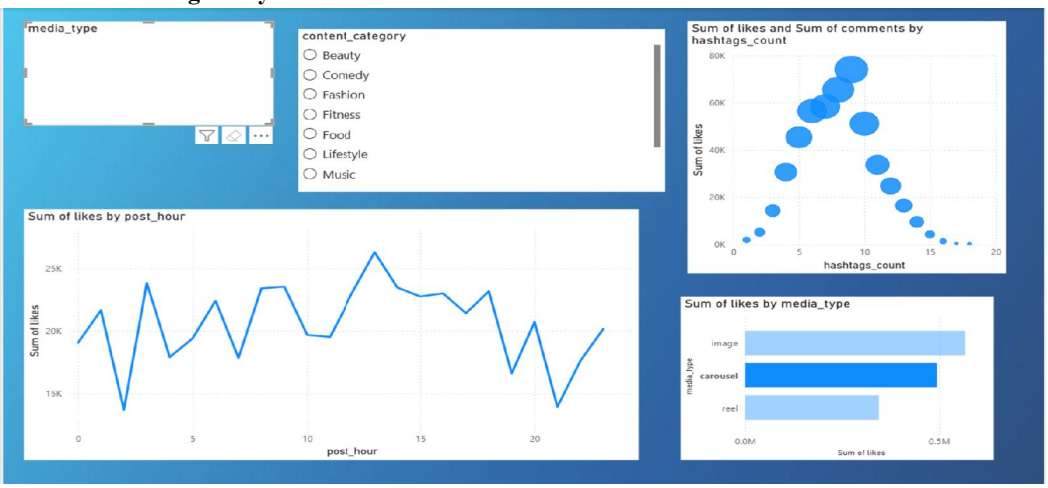
Explanation:

The dashboard presents an overview of Instagram engagement performance using key metrics such as likes, comments, shares, followers, and content categories. The visualizations help analyze follower growth trends, content distribution, and media type performance. The dashboard also allows interactive filtering based on content category and media type

Findings:

- Image posts received higher likes compared to reels.
- Follower growth varied across different months.
- Fashion and beauty content categories had higher post distribution.
- Overall engagement performance remained consistent across media types.

Posting Time and Hashtag Analysis



Explanation:

This dashboard analyzes the impact of posting hour, hashtag usage, and media type on Instagram engagement. The visualizations help identify the best posting time, optimal hashtag count, and the media type that generates higher likes and audience interaction.

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Findings:

Posts uploaded during peak hours received higher likes.

Moderate hashtag usage generated better engagement compared to excessive hashtags.

Image posts performed better than reels and carousel posts in terms of likes. Engagement levels varied depending on posting time and hashtag count.

Engagement Insights and Content Performance

Explanation:

This dashboard provides insights into Instagram engagement trends using metrics such as likes, comments, engagement rate, content category, and post performance distribution. The dashboard helps identify high-performing content categories and overall audience interaction patterns.

Findings:

Fashion and Food categories showed higher engagement rates.

Image posts received more likes and comments compared to other media types.

Monthly engagement trends fluctuated across different time periods.

Most posts belonged to medium and high performance categories, indicating stable audience engagement.

II. CONCLUSION

The study analyzed Instagram engagement trends using Power BI and secondary data collected from Kaggle datasets. The analysis showed that factors such as posting time, hashtags, and content type directly affect audience engagement. Image posts received better engagement compared to reels and carousel posts, while moderate hashtag usage improved post visibility. Power BI dashboards helped convert raw social media data into meaningful visual insights. The study concludes that data analytics and visualization can help businesses, influencers, and marketers improve their social media strategies and audience interaction.

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Suggestions / Recommendations

- Post content during peak audience activity hours
- Use relevant and moderate hashtags for better reach
- Focus more on high-performing content categories
- Use visual and engaging media content regularly
- Utilize analytics tools like Power BI for performance tracking

Limitations of the Study

- The study is based only on secondary data from Kaggle
- Data may not represent all Instagram users
- Limited engagement metrics were analyzed
- Results may vary depending on changing Instagram algorithms

Future Scope

Future research can include real-time Instagram data and advanced analytics techniques such as machine learning and predictive analysis. The study can also be extended to compare engagement trends across multiple social media platforms like Facebook, Twitter, and YouTube.

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