



# INSTAGRAM USER --- ANALYTICS



# INTRODUCTION

Instagram is a leading social media platform primarily focused on photo and video sharing. Launched in 2010 by Kevin Systrom and Mike Krieger, it was later acquired by Facebook (now Meta) in 2012. Over the years, Instagram has evolved into a major platform for personal expression, influencer marketing, e-commerce, and digital advertising.



# PROJECT DESCRIPTION

In this project, I take on the role of a Data Analyst working with Instagram's product team to analyze user interactions and engagement. Using SQL, I extract valuable insights from Instagram user data to help optimize features, enhance user experience, and drive business growth. By analyzing key metrics such as likes, comments, user activity, and content performance, this project provides actionable insights that assist the marketing, product, and development teams in making informed decisions. These insights contribute to improving engagement, refining content strategies, and shaping the future of the Instagram platform.



# INSTAGRAM DATASET SCHEMA OVERVIEW

This dataset represents an Instagram-like social media platform with user interactions such as posts, likes, comments, follows, and tags.

- **Users** → Stores user details (ID, username, account creation date).
- **Photos** → Stores images posted by users along with timestamps.
- **Comments** → Tracks comments made by users on photos.
- **Likes** → Records user likes on photos (ensuring unique likes per user per photo).
- **Follows** → Captures user follow relationships (who follows whom).
- **Tags** → Stores unique hashtags used in posts.
- **Photo Tags** → Links photos with associated tags for categorization.



# APPROACH

- **FIRSTLY, I UNDERSTOOD THE DATA AND REVIEWED ALL THE TABLES LIKE USERS, LIKES, PHOTOS ETC. AND GOT SOME IDEA HOW THE RELATION CAN BE BUILT**
- **AFTER UNDERSTANDING ALL THE QUESTIONS, EXECUTED THE QUERIES, MAINLY FOCUSED ON FILTERING, JOINING TABLES, ALSO USED SOME AGGREGATE FUNCTIONS LIKE COUNT, AVERAGE ETC.**
- **THEN ANALYZED THE RESULTS AND INTERPRETED FINDINGS AND MADE ACTIONABLE INSIGHTS.**



# TECH STACK USED

## SQL SERVER MANAGEMENT STUDIO (SSMS)

I preferred this software as it provides user friendly interface and seamless experience and supports all the SQL server features including advanced data management.



# PROBLEM --- STATEMENTS



# LOYAL USER REWARD – IDENTIFYING THE OLDEST USERS

```
--QUESTION 1-Identify the five oldest users on Instagram from the provided database.  
SELECT TOP 5 ID,USERNAME,CREATED_AT FROM USERS  
ORDER BY CREATED_AT ASC
```

ID	USERNAME	CREATED_AT
80	Darby_Herzog	2016-05-06 00:14:21.190
67	Emilio_Bernier52	2016-05-06 13:04:29.960
63	Elenor88	2016-05-08 01:30:40.677
95	Nicole71	2016-05-09 17:30:22.370
38	Jordyn.Jacobson2	2016-05-14 07:56:25.837

- Analyzing their behavior can provide insights into what keeps users engaged over time, informing feature development and marketing strategies.
- Long-term users are valuable brand advocates; rewarding them increases user satisfaction and promotes word-of-mouth marketing.
- Understanding the behavior of long-term users can help optimize retention strategies for newer users.





# INACTIVE USER ENGAGEMENT- IDENTIFYING USERS WITH ZERO POSTS

- Identifying 26 inactive users who have never posted indicates a potential risk of churn. Users who don't engage early are less likely to stay long-term.
- Send targeted emails encouraging these users to post their first photo.
- Introduce a "First Post Challenge" with rewards
- Provide limited-time incentives like exclusive filters, stickers, or profile badges for first-time posters.

```
--QUESTION 2-Identify users who have never posted a single photo on Instagram.  
SELECT U.ID,U.USERNAME  
FROM USERS U  
LEFT JOIN  
PHOTOS P ON U.ID=P.USER_ID  
WHERE P.ID IS NULL
```

ID	USERNAME
5	Aniya_Hackett
7	Kassandra_Homenick
14	Jaclyn81
21	Rocio33
24	Maxwell.Halvorson
25	Tierra.Trantow
34	Pearl7
36	Ollie_Ledner37
41	Mckenna17
45	David.Osinski47
49	Morgan.Kassulke
53	Linnea59
54	Duane60



# CONTEST WINNER DECLARATION- IDENTIFYING THE MOST LIKED PHOTO

```
--QUESTION 3-Determine the winner of the contest and provide their details to the team.  
SELECT TOP 1 U.USERNAME,P.ID,P.USER_ID,COUNT(L.USER_ID) AS TOTAL_LIKES  
FROM LIKES L INNER JOIN PHOTOS P ON L.PHOTO_ID=P.ID  
INNER JOIN USERS U ON P.USER_ID=U.ID  
GROUP BY U.USERNAME,P.ID,P.USER_ID  
ORDER BY TOTAL_LIKES DESC
```

USERNAME	ID	USER_ID	TOTAL_LIKES
Zack_Kemmer93	145	52	48

- The user Zack\_Kemmer93 has won the contest with 48 likes on a single photo.
- The marketing team can analyze the content posted by Zack\_Kemmer93 to understand what type of content drives high engagement
- Instagram can leverage insights from high-engagement posts to refine its content recommendation algorithm.
- Introduce tiered rewards (e.g., for top 3 most-liked photos) to encourage more users to compete.



# TOP 5 TRENDING HASHTAGS FOR MAXIMUM REACH

```
--QUESTION 4- Identify and suggest the top five most commonly used hashtags on the platform.  
SELECT TOP 5 T.TAG_NAME,COUNT(PHOTO_ID) AS TOTAL  
FROM TAGS T FULL OUTER JOIN PHOTO_TAGS PT ON T.ID=PT.TAG_ID  
GROUP BY T.TAG_NAME  
ORDER BY TOTAL DESC
```

TAG_NAME	TOTAL
smile	59
beach	42
party	39
fun	38
concert	24

- The most popular hashtag is #smile (59 mentions), indicating a preference for positive, uplifting content.
- Brands should incorporate #smile, #beach, #party, #fun, and #concert in their posts to maximize audience engagement.
- Collaborate with influencers and content creators who frequently use these hashtags.



# OPTIMAL AD CAMPAIGN LAUNCH: IDENTIFYING THE BEST DAY OF THE WEEK

```
-- QUESTION 5- Determine the day of the week when most users register on Instagram.
SELECT TOP 1 DATENAME(WEEKDAY, CREATED_AT) AS DAYS , COUNT(ID) AS COUNT_OF_ID FROM USERS
GROUP BY DATENAME(WEEKDAY, CREATED_AT)
ORDER BY COUNT(ID) DESC
```

%

Results Messages

DAYS	COUNT_OF_ID
Sunday	16

- The highest number of user registrations occurred on Sunday (16 new users).
- Sundays could indicate a higher engagement period, likely due to increased leisure time.
- Since user sign-ups peak on Sundays, launching an ad campaign on this day may maximize exposure to new users.
- Promotions or influencer collaborations can be scheduled for weekends to boost engagement.



# INSTAGRAM USER ENGAGEMENT: ANALYZING POSTING ACTIVITY TRENDS

```
--QUESTION 6- Calculate the average number of posts per user on Instagram.
SELECT COUNT(P.ID) AS TOTAL_POSTS,
COUNT(DISTINCT U.ID) AS TOTAL_USERS,
COUNT(P.ID)/COUNT(DISTINCT U.ID) AS AVG_POSTS_PER_USER
FROM USERS U LEFT JOIN PHOTOS P ON U.ID=P.USER_ID
```

results Messages

TOTAL_POSTS	TOTAL_USERS	AVG_POSTS_PER_USER
257	100	2

- The platform has a total of 257 posts made by 100 unique users.
- Since the average posts per user is low (2 posts/user), it suggests that either users are not frequently posting or a significant portion of users are inactive.
- Implement campaigns encouraging users to post more, such as themed challenges or rewards for reaching a certain number of posts.



# DETECTING BOTS & FAKE ENGAGEMENT ON THE PLATFORM

- A total of 13 users have liked every single photo on the platform, which is highly abnormal.
- This suggests the presence of automated or fake accounts, as normal users are unlikely to engage with all posts.
- We can block those accounts or we can give them some warnings
- if they are violating platform policies.

```
--QUESTION 7 Identify users (potential bots) who have liked every single photo on the site,  
SELECT USER_ID, COUNT(PHOTO_ID) AS COUNTS  
FROM LIKES  
GROUP BY USER_ID  
HAVING COUNT(USER_ID)=(SELECT COUNT(ID) FROM PHOTOS)|
```

results	
USER_ID	COUNTS
5	257
14	257
21	257
24	257
36	257
41	257
54	257
57	257
66	257
71	257
75	257
76	257
91	257



# **BUSINESS RECOMMENDATIONS**



- Most user registrations occur on Sunday, making it the ideal day to launch ad campaigns.
- Instagram needs to incentivize content creation through challenges, features, or rewards to boost engagement.
- Fake engagement can mislead advertisers and reduce trust. Implementing stricter bot detection and removal strategies is crucial.
- Introducing content-sharing incentives, trending challenges, and interactive features can encourage more user participation.
- The most popular hashtags are #smile, #beach, #party, #fun, and #concert.
- Brands and content creators can optimize their posts using these hashtags to increase visibility and engagement.





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# THANK --- YOU

"Data speaks louder than words – unlocking user insights drives smarter decisions and better engagement."