# AD-HOC REQUEST QUERIES

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```
USE bh_ad_hoc;

/* Business Request – 1: Monthly Circulation Drop Check
Generate a report showing the top 3 months (2019–2024) where any city recorded the
sharpest month-over-month decline in net_circulation. */

WITH monthly_circulation AS (
   SELECT
      dc.city AS city_name,
      fps.city_id,
      fps.month,
      fps.net_circulation,
      LAG(fps.net_circulation) OVER (
         PARTITION BY fps.city_id
         ORDER BY STR_TO_DATE(fps.month, '%m/%d/%Y')
      ) AS prev_month_circulation
   FROM fact_print_sales fps
   INNER JOIN dim_city dc ON fps.city_id = dc.city_id
   WHERE YEAR(STR_TO_DATE(fps.month, '%m/%d/%Y')) BETWEEN 2019 AND 2024
     AND fps.net_circulation IS NOT NULL
),
circulation_changes AS (
   SELECT
      city_name,
      DATE_FORMAT(STR_TO_DATE(month, '%m/%d/%Y'), '%Y-%m') AS month,
      net_circulation,
      prev_month_circulation,
      (net_circulation - prev_month_circulation) AS circulation_change
   FROM monthly_circulation
   WHERE prev_month_circulation IS NOT NULL
```

```
)
SELECT
   city_name,
   month,
   net_circulation
FROM circulation_changes
WHERE circulation_change < 0
ORDER BY circulation_change ASC
LIMIT 3;
```

| | city_name | month | net_circulation |
|---|---|---|---|
| ▶ | Varanasi | 2021-01 | 382018 |
| | Varanasi | 2019-11 | 431606 |
| | Jaipur | 2020-01 | 420680 |

```
/*Business Request – 2: Yearly Revenue Concentration by Category
Identify ad categories that contributed > 50% of total yearly ad revenue. */

WITH yearly_data AS (
   SELECT
      RIGHT(far.quarter, 4) AS year,
      far.ad_category AS category_name,
      SUM(far.ad_revenue_inr) AS category_revenue,
      SUM(SUM(far.ad_revenue_inr)) OVER (PARTITION BY RIGHT(far.quarter, 4)) AS total_revenue_year
   FROM fact_ad_revenue far
   GROUP BY RIGHT(far.quarter, 4), far.ad_category
)
SELECT
   year,
   category_name,
   category_revenue,
   total_revenue_year,
   ROUND(category_revenue * 100.0 / total_revenue_year, 2) AS pct_of_year_total
FROM yearly_data
WHERE category_revenue * 100.0 / total_revenue_year > 50
ORDER BY year, pct_of_year_total DESC;
```

| year | category_name | category_revenue | total_revenue_year | pct_of_year_total |
|---|---|---|---|---|

/*Business Request – 3: 2024 Print Efficiency Leaderboard

For 2024, rank cities by print efficiency = net_circulation / copies_printed. Return top 5.*/

```
WITH city_2024 AS (
   SELECT
      dc.city AS city_name,
      SUM(fps.copies_sold + fps.copies_returned) AS copies_printed_2024,
      SUM(fps.net_circulation) AS net_circulation_2024,
      SUM(fps.net_circulation) / SUM(fps.copies_sold + fps.copies_returned) AS efficiency_ratio
   FROM fact_print_sales fps
   JOIN dim_city dc
      ON fps.city_id = dc.city_id
   WHERE YEAR(STR_TO_DATE(fps.month, '%c/%e/%Y')) = 2024
   GROUP BY dc.city
)

SELECT
   city_name,
   copies_printed_2024,
   net_circulation_2024,
   ROUND(efficiency_ratio, 2) AS efficiency_ratio,
   RANK() OVER (ORDER BY efficiency_ratio DESC) AS efficiency_rank_2024
FROM city_2024
ORDER BY efficiency_rank_2024
LIMIT 5;
```

| city_name | copies_printed_2024 | net_circulation_2024 | efficiency_ratio | efficiency_rank_2024 |
|---|---|---|---|---|
| Ranchi | 2309444 | 2092062 | 0.91 | 1 |
| Ahmedabad | 3046823 | 2746691 | 0.90 | 2 |
| Patna | 2506557 | 2252819 | 0.90 | 3 |
| Jaipur | 4594153 | 4128641 | 0.90 | 4 |
| Varanasi | 4591555 | 4123611 | 0.90 | 5 |

/*Business Request – 4 : Internet Readiness Growth (2021)

For each city, compute the change in internet penetration from Q1-2021 to Q4-2021

and identify the city with the highest improvement. */

```
SELECT
   UPPER(c.city) AS city_name,
   MAX(CASE WHEN fcr.quarter = 'Q1' THEN fcr.internet_penetration END) AS internet_rate_q1_2021,
   MAX(CASE WHEN fcr.quarter = 'Q4' THEN fcr.internet_penetration END) AS internet_rate_q4_2021,
   ROUND(
      (MAX(CASE WHEN fcr.quarter = 'Q4' THEN fcr.internet_penetration END) -
       MAX(CASE WHEN fcr.quarter = 'Q1' THEN fcr.internet_penetration END)), 2
   ) AS delta_internet_rate
FROM fact_city_readiness fcr
JOIN dim_city c
   ON fcr.city_id = c.city_id
WHERE fcr.year = 2021
  AND fcr.quarter IN ('Q1', 'Q4')
GROUP BY c.city
ORDER BY delta_internet_rate DESC;
```

| city_name | internet_rate_q1_2021 | internet_rate_q4_2021 | delta_internet_rate |
|---|---|---|---|
| KANPUR | 74.27 | 76.77 | 2.5 |
| MUMBAI | 73.31 | 75.74 | 2.43 |
| AHMEDABAD | 73.03 | 74.8 | 1.77 |
| DELHI | 48.68 | 50.41 | 1.73 |
| PATNA | 67.73 | 68.56 | 0.83 |
| LUCKNOW | 55 | 55.71 | 0.71 |
| JAIPUR | 10 | 10 | 0 |
| VARANASI | 73.51 | 73.45 | -0.06 |
| BHOPAL | 68.21 | 66.48 | -1.73 |
| RANCHI | 63.49 | 60.36 | -3.13 |

```
/*Business Request – 5: Consistent Multi-Year Decline (2019→2024)
Find cities where both net_circulation and ad_revenue decreased every year from 2019
through 2024 (strictly decreasing sequences).*/

WITH yearly_print AS (
   SELECT
      fps.edition_id,
      YEAR(STR_TO_DATE(fps.month, '%c/%e/%Y')) AS year,
      SUM(fps.net_circulation) AS yearly_net_circulation
   FROM fact_print_sales fps
   WHERE YEAR(STR_TO_DATE(fps.month, '%c/%e/%Y')) BETWEEN 2019 AND 2024
   GROUP BY fps.edition_id, YEAR(STR_TO_DATE(fps.month, '%c/%e/%Y'))
),

yearly_ad AS (
   SELECT
      far.edition_id,
      RIGHT(far.quarter,4) AS year,
      SUM(far.ad_revenue_inr) AS yearly_ad_revenue
   FROM fact_ad_revenue far
   WHERE RIGHT(far.quarter,4) BETWEEN '2019' AND '2024'
   GROUP BY far.edition_id, RIGHT(far.quarter,4)
),

combined AS (
   SELECT
      p.edition_id,
      p.year,
      p.yearly_net_circulation,
      a.yearly_ad_revenue
   FROM yearly_print p
   JOIN yearly_ad a
     ON p.edition_id = a.edition_id AND p.year = a.year
```

```
),

flags AS (
  SELECT
    edition_id,
    year,
    yearly_net_circulation,
    yearly_ad_revenue,
    CASE
      WHEN LAG(yearly_net_circulation) OVER(PARTITION BY edition_id ORDER BY year) > yearly_net_circulation
      THEN 'Yes' ELSE 'No'
    END AS is_declining_print,
    CASE
      WHEN LAG(yearly_ad_revenue) OVER(PARTITION BY edition_id ORDER BY year) > yearly_ad_revenue
      THEN 'Yes' ELSE 'No'
    END AS is_declining_ad_revenue
  FROM combined
),

strict_decline AS (
  SELECT
    edition_id
  FROM flags
  GROUP BY edition_id
  HAVING SUM(CASE WHEN is_declining_print='Yes' THEN 1 ELSE 0 END) = 5
    AND SUM(CASE WHEN is_declining_ad_revenue='Yes' THEN 1 ELSE 0 END) = 5
)

SELECT
  UPPER(c.city) AS city_name,
  f.year,
  CONCAT(ROUND(f.yearly_net_circulation/1000000,0),'M') AS yearly_net_circulation,
  CONCAT(ROUND(f.yearly_ad_revenue/1000000,0),'M') AS yearly_ad_revenue,
  f.is_declining_print,
```

```
    f.is_declining_ad_revenue,
    'Yes' AS is_declining_both
FROM flags f
JOIN strict_decline s ON f.edition_id = s.edition_id
JOIN dim_city c ON f.edition_id = c.city_id
ORDER BY c.city, f.year;
```

| city_name | year | yearly_net_circulation | yearly_ad_revenue | is_declining_print | is_declining_ad_revenue | is_declining_both |
|---|---|---|---|---|---|---|

```
/* Business Request – 6 : 2021 Readiness vs Pilot Engagement Outlier
In 2021, identify the city with the highest digital readiness score but among the bottom 3
in digital pilot engagement. */

WITH readiness AS (
    SELECT
        dc.city AS city_name,
        ROUND(AVG((fcr.literacy_rate + fcr.smartphone_penetration + fcr.internet_penetration)/3), 2) AS
readiness_score_2021
    FROM fact_city_readiness fcr
    JOIN dim_city dc ON fcr.city_id = dc.city_id
    WHERE fcr.year = 2021
    GROUP BY dc.city
),

engagement AS (
    SELECT
        dc.city AS city_name,
        SUM(fdp.users_reached) AS engagement_metric_2021
    FROM fact_digital_pilot fdp
    JOIN dim_city dc ON fdp.city_id = dc.city_id
    WHERE YEAR(STR_TO_DATE(fdp.launch_month, '%c/%e/%Y')) = 2021
    GROUP BY dc.city
),
```

```
combined AS (
    SELECT
        r.city_name,
        r.readiness_score_2021,
        e.engagement_metric_2021
    FROM readiness r
    JOIN engagement e ON r.city_name = e.city_name
),

ranked AS (
    SELECT
        city_name,
        readiness_score_2021,
        engagement_metric_2021,
        RANK() OVER (ORDER BY readiness_score_2021 DESC) AS readiness_rank_desc,
        RANK() OVER (ORDER BY engagement_metric_2021 ASC) AS engagement_rank_asc
    FROM combined
)

SELECT
    city_name,
    readiness_score_2021,
    engagement_metric_2021,
    readiness_rank_desc,
    engagement_rank_asc,
    CASE WHEN engagement_rank_asc <= 3 THEN 'Yes' ELSE 'No' END AS is_outlier
FROM ranked
ORDER BY engagement_rank_asc ASC, readiness_rank_desc DESC;
```

| city_name | readiness_score_2021 | engagement_metric_2021 | readiness_rank_desc | engagement_rank_asc | is_outlier |
|---|---|---|---|---|---|
| Kanpur | 75.23 | 88749 | 1 | 1 | Yes |
| Ranchi | 68.64 | 110125 | 7 | 2 | Yes |
| Jaipur | 54.95 | 119681 | 10 | 3 | Yes |
| Delhi | 56.08 | 121423 | 9 | 4 | No |
| Patna | 70.77 | 121974 | 6 | 5 | No |
| Lucknow | 73.2 | 123945 | 4 | 6 | No |
| Mumbai | 68.33 | 128561 | 8 | 7 | No |
| Ahmedabad | 72.39 | 135003 | 5 | 8 | No |
| Bhopal | 73.21 | 139626 | 3 | 9 | No |
| Varanasi | 73.89 | 143151 | 2 | 10 | No |