ElixScript

Sales Funnel, User Behavior, & Revenue Analysis Using BigQuery

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• Objective

- Menganalisis perilaku user, performa funnel, efektivitas channel, dan dampak ke revenue untuk mendukung decision-making

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Data Understanding & Check

Row	event_id	user_id	event_type	event_date	product_id	amount	traffic_source
1	7343	4431	page_view	2025-12-30 08:16:15.732931 UTC	101	*null*	email
2	7344	4431	add_to_cart	2025-12-30 08:24:15.732931 UTC	101	*null*	email
3	7345	4431	checkout_start	2025-12-30 08:31:15.732931 UTC	101	*null*	email
4	7346	4431	payment_info	2025-12-30 08:38:15.732931 UTC	101	*null*	email
5	7347	4431	purchase	2025-12-30 08:41:15.732931 UTC	101	125.38	email
6	10185	5898	page_view	2025-12-30 23:23:57.811630 UTC	101	*null*	email
7	10186	5898	add_to_cart	2025-12-30 23:40:57.811630 UTC	101	*null*	email
8	10187	5898	checkout_start	2025-12-30 23:45:57.811630 UTC	101	*null*	email

Dataset ini berisi event-level transaction data, di mana setiap baris **merepresentasikan satu aktivitas user** (misalnya page_view, add_to_cart, hingga purchase) lengkap dengan waktu kejadian, produk, nilai transaksi, dan sumber traffic.

High-Level Sales Funnel Overview

```sql
-- membuat CTE FUNCTION untuk menghitung jumlah user di setiap stage funnel
WITH funnel_stages AS (

  SELECT
    COUNT(DISTINCT CASE WHEN event_type = 'page_view' THEN user_id END) AS stage_1_views,
    COUNT(DISTINCT CASE WHEN event_type = 'add_to_cart' THEN user_id END) AS stage_2_cart,
    COUNT(DISTINCT CASE WHEN event_type = 'checkout_start' THEN user_id END) AS stage_3_checkout,
    COUNT(DISTINCT CASE WHEN event_type = 'payment_info' THEN user_id END) AS stage_4_payment,
    COUNT(DISTINCT CASE WHEN event_type = 'purchase' THEN user_id END) AS stage_5_purchase

  FROM `sales-funnel-analysis-487709.sales_funnel.transactions`
  -- ini untuk mengambil 30 hari ke belakang
  WHERE event_date >= TIMESTAMP(DATE_SUB(CURRENT_DATE(), INTERVAL 30 DAY))
)
```

Tujuan : Mengukur jumlah user unik di setiap tahap funnel dalam 30 hari terakhir.

Tujuan : menemukan conversion rate

.

```sql
-- menemukan conversion rate pada funnel
SELECT
  stage_1_views,
  stage_2_cart,
  ROUND(stage_2_cart * 100.0 / stage_1_views, 2) AS view_to_cart_rate,

  stage_3_checkout,
  ROUND(stage_3_checkout * 100.0 / stage_2_cart, 2) AS cart_to_checkout_rate,

  stage_4_payment,
  ROUND(stage_4_payment * 100.0 / stage_3_checkout, 2) AS checkout_to_payment_rate,

  stage_5_purchase,
  ROUND(stage_5_purchase * 100.0 / stage_4_payment, 2) AS payment_to_purchase_rate,
  ROUND(stage_5_purchase * 100.0 / stage_1_views, 2) AS overall_conversion_rate

FROM funnel_stages;
```

High-Level Sales Funnel Overview

Output :

stage_1_views	stage_2_cart	view_to_cart_rate	stage_3_checkout	cart_to_checkout...	stage_4_payment
2022	640	31.65	444	69.38	354

checkout_to_pay...	stage_5_purchase	payment_to_purc...	overall_conversio...
79.73	330	93.22	16.32

Drop-off terbesar terjadi pada tahap page **view ke add to cart (31,65%)**, menunjukkan potensi masalah di minat awal atau tampilan produk. Sebaliknya, **checkout hingga purchase sangat efisien (93,22%)**, sehingga optimasi paling berdampak adalah meningkatkan konversi di tahap awal funnel.

Funnel Analysis by **Traffic Source**

```sql
-- Funnel berdasarkan traffic source
WITH source_funnel AS (
  SELECT
    traffic_source,
    COUNT(DISTINCT CASE WHEN event_type = 'page_view' THEN user_id END) AS views,

    COUNT(DISTINCT CASE WHEN event_type = 'add_to_cart' THEN user_id END) AS carts,

    COUNT(DISTINCT CASE WHEN event_type = 'purchase' THEN user_id END) AS purchases
  FROM `sales-funnel-analysis-487709.sales_funnel.transactions`
  WHERE event_date >= TIMESTAMP(DATE_SUB(CURRENT_DATE(), INTERVAL 30 DAY))
  GROUP BY traffic_source
)
```

Tujuan :
Menghitung funnel per channel

Tujuan :
Mengukur konversi tiap channel

```sql
SELECT
  traffic_source,
  views,
  carts,
  purchases,

  ROUND(carts * 100.0 / NULLIF(views, 0), 2) AS cart_conversion_rate,
  ROUND(purchases * 100.0 / NULLIF(views, 0), 2) AS purchase_conversion_rate,
  ROUND(purchases * 100.0 / NULLIF(carts, 0), 2) AS cart_to_purchase_conversion_rate

FROM source_funnel
ORDER BY purchases DESC;
```

Funnel Analysis by **Traffic Source**

Output :

traffic_source	views	carts	purchases	cart_conversion_r...	purchase_conver...	cart_to_purchase...
organic	822	273	142	33.21	17.27	52.01
paid_ads	374	142	78	37.97	20.86	54.93
email	211	136	69	64.45	32.7	50.74
social	615	89	41	14.47	6.67	46.07

Channel **email** menunjukkan kualitas tertinggi dengan **cart conversion (64,45%)** dan **purchase conversion (32,7%)** paling besar, menandakan user yang datang dari email memiliki niat beli kuat. Sebaliknya, **social media** memiliki **traffic cukup besar** tetapi **conversion terendah**, sehingga berpotensi menjadi fokus optimasi konten atau indikasi traffic ber-kualitas rendah dibanding channel lain.

User Journey & Time to Conversion

```sql
WITH user_journey AS (
  SELECT
    user_id,
    MIN(CASE WHEN event_type = 'page_view'  THEN event_date END) AS view_time,
    MIN(CASE WHEN event_type = 'add_to_cart' THEN event_date END) AS cart_time,
    MIN(CASE WHEN event_type = 'purchase'   THEN event_date END) AS purchase_time
  FROM `sales-funnel-analysis-487709.sales_funnel.transactions`
  WHERE event_date >= TIMESTAMP(DATE_SUB(CURRENT_DATE(), INTERVAL 30 DAY))
  GROUP BY user_id
  HAVING MIN(CASE WHEN event_type = 'purchase' THEN event_date END) IS NOT NULL
)
```

Tujuan :
Melacak perjalanan waktu user

Tujuan :
rata-rata durasi perjalanan user (dalam menit)

```sql
SELECT
  COUNT(*) AS converted_users,
  ROUND(AVG(TIMESTAMP_DIFF(cart_time, view_time, MINUTE)), 2) AS avg_view_to_cart_minutes,
  ROUND(AVG(TIMESTAMP_DIFF(purchase_time, cart_time, MINUTE)), 2) AS avg_cart_to_purchase_minutes,
  ROUND(AVG(TIMESTAMP_DIFF(purchase_time, view_time, MINUTE)), 2) AS avg_total_journey_minutes
FROM user_journey;
```

User Journey & Time to Conversion

Output :

converted_users	avg_view_to_cart_minutes	avg_cart_to_purchase_minutes	avg_total_journey_minutes
330	10.98	13.03	24.01

User yang berhasil konversi membutuhkan **rata-rata 24 menit** dari page view hingga purchase, dengan **jeda terlama** terjadi pada tahap **cart ke purchase**, yang mengindikasikan potensi optimasi di proses checkout atau pembayaran.

Funnel & Revenue Performance

```sql
WITH funnel_revenue AS (
  SELECT
    COUNT(DISTINCT CASE WHEN event_type = 'page_view' THEN user_id END) AS total_visitors,
    COUNT(DISTINCT CASE WHEN event_type = 'purchase' THEN user_id END) AS total_buyers,
    SUM(CASE WHEN event_type = 'purchase' THEN amount END) AS total_revenue,
    COUNT(CASE WHEN event_type = 'purchase' THEN 1 END) AS total_orders
  FROM `sales-funnel-analysis-487709.sales_funnel.transactions`
  WHERE event_date >= TIMESTAMP(DATE_SUB(CURRENT_DATE(), INTERVAL 30 DAY))
)
```

Tujuan :
Menghitung metrik revenue funnel

Tujuan :
Mengukur efektivitas monetisasi funnel

```sql
SELECT
  total_visitors,
  total_buyers,
  total_orders,
  total_revenue,
  total_revenue / NULLIF(total_orders, 0) AS avg_order_value,
  total_revenue / NULLIF(total_buyers, 0) AS revenue_per_buyer,
  total_revenue / NULLIF(total_visitors, 0) AS revenue_per_visitor
FROM funnel_revenue;
```

Funnel & Revenue Performance

Output :

total_visitors	total_buyers	total_orders	total_revenue	avg_order_value	revenue_per_buyer	revenue_per_visitor
2022	330	330	35534.32999999...	107.6797878787...	107.6797878787...	17.57385262116...

Dengan **2.022 visitors** menghasilkan **330 buyers** dan total revenue sekitar **35,5K**, nilai AOV dan revenue per buyer relatif tinggi **(~107)**, menandakan kualitas transaksi baik. Namun **revenue per visitor** masih **rendah (~17,6)**, sehingga peluang terbesar ada pada meningkatkan conversion awal funnel untuk mendorong pertumbuhan revenue tanpa menaikkan nilai transaksi.

Final Business Recommendations

1. UX & Website Optimization

- **Jangan Ubah Alur Checkout**

Conversion rate dari **checkout → purchase mencapai ±93%**, yang menunjukkan proses pembayaran sudah sangat efisien dan minim friksi.

- **Aksi :**

Hindari redesign atau perubahan besar pada halaman checkout karena berisiko merusak alur yang saat ini sudah bekerja sangat baik.

Final Business Recommendations

2. Strategi Marketing

- **Kurangi Fokus Penjualan dari Social Media**

Channel **social media memiliki volume traffic cukup besar (±615 views), namun conversion ke purchase paling rendah (±6,67%)**, mengindikasikan banyak window shoppers.

- **Aksi :**

Alihkan objective iklan sosial dari traffic/sales langsung ke retargeting atau lead generation untuk mengumpulkan data user.

- **Perkuat Email Marketing**

Channel email menunjukkan **performa terbaik dengan purchase conversion ±32,7%**, tertinggi dibanding channel lain.

- **Aksi:**

Implementasikan strategi agresif pengumpulan email (popup, voucher, newsletter) terutama untuk user dari social media, karena data menunjukkan user email jauh lebih berpotensi untuk membeli.

Final Business Recommendations

3. Finansial & Revenue

- **Evaluasi Biaya Iklan terhadap Nilai Transaksi**

Rata-rata **Average Order Value (AOV) ≈ 107**, sementara **revenue per visitor hanya ≈ 17,6,** yang berarti revenue masih sangat bergantung pada peningkatan conversion awal funnel.

- **Aksi :**

Tetapkan batas Customer Acquisition Cost (CAC) yang ketat. Jika biaya akuisisi user . terutama dari social media , mendekati atau melebihi nilai kontribusi revenue per visitor, maka channel tersebut berpotensi tidak profitable.

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Thank You