# Operation Analytics and Investigating Metric Spike

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# Agenda

Case Study 1

Case Study 2

# Introduction

Operation Analytics is a crucial analysis performed on the complete end-to-end operations of a company. Its primary objective is to identify areas that require improvement. This type of analysis holds immense significance for a company as it aids in predicting overall growth or decline in the company's fortunes. It facilitates better automation, enhances understanding and collaboration between cross-functional teams, and improves workflow effectiveness.

# Case Study 1

JOB_DATA

# Case Study 1

The database given in this case study should be converted into SQL language by creating tables. With the help that database we can find the answer of the following question.

- Number Of job
- Throughput
- Percentage share of each language
- Duplicate

# Number of job reviewed

Using the Statement :

```
SELECT count(job_id)/(30*24) AS
number_of_jobs_reviewed FROM job_data;
```

Result :

| number_of_jobs |
| --- |
| 0.0111 |

# Throughput

Using the Statement :

```
SELECT ds as date,
jobs_reviewed,
AVG(jobs_reviewed)
OVER(ORDER BY ds ROWS
BETWEEN 6 PRECEDING AND
CURRENT ROW) AS
average_job_id FROM ( SELECT
ds, COUNT(job_id) AS
jobs_reviewed FROM job_data
GROUP BY ds ORDER BY ds ) a;
```

| | date | jobs_reviewed | average_job_id |
|---|---|---|---|
| | 2020-11-25 | 1 | 1.0000 |
| ▶ | 2020-11-26 | 1 | 1.0000 |
| | 2020-11-27 | 1 | 1.0000 |
| | 2020-11-29 | 1 | 1.2000 |
| | 2020-11-28 | 2 | 1.2500 |
| | 2020-11-30 | 2 | 1.3333 |

# Percentage share of each language

Using the Statement :

```
select job_data.job_id, job_data.language, count(distinct job_data.language) as total_ , ((count(job_data.language)/(select count(*) from job_data))*100) as percentage_ from job_data group by job_data.language;
```

Result :

| job_id | language | total_ | Percentage_ |
|---|---|---|---|
| 22 | Arabic | 1 | 12.5 |
| 21 | English | 1 | 12.5 |
| 11 | French | 1 | 12.5 |
| 25 | Hindi | 1 | 12.5 |
| 20 | Italian | 1 | 12.5 |
| 23 | Persian | 1 | 37.5 |

# Duplicate Rows

Using the Statement :

```
SELECT * FROM ( SELECT *,
ROW_NUMBER()OVER(PARTITION BY job_id) AS row_num
FROM job_data ) a WHERE row_num>1;
```

Result :

| ds | job_id | actor_id | event | language | time_spent | org | row_num |
|---|---|---|---|---|---|---|---|
| 28-11-2020 | 23 | 1005 | transfer | Persian | 22 | D | 2 |
| 26-11-2020 | 23 | 1004 | skip | Persian | 56 | A | 3 |

# Case Study 2

## Investigating metric spike

# Case Study 2

The database given in this case study should be converted into SQL language by creating tables. With the help that database we can find the answer of the following question.

- User Engagement
- User Growth
- Weekly Retention
- Weekly Engagement
- Email Engagement

# User Engagement

Your task: Calculate the weekly user engagement.

Query :

```
SELECT extract (week from occurred_at) as week_number,
count(distinct user_id) as number_of_users FROM
tutorial.yammer_events group by week_number;
```

# RESULT

| week_number | number_of_users |
|---|---|
| 18 | 791 |
| 19 | 1244 |
| 20 | 1270 |
| 21 | 1341 |
| 22 | 1293 |
| 23 | 1366 |
| 24 | 1434 |
| 25 | 1464 |
| 26 | 1443 |
| 27 | 1477 |
| 28 | 1556 |
| 29 | 1556 |
| 30 | 1593 |
| 31 | 1685 |
| 32 | 1483 |
| 33 | 1438 |
| 34 | 1412 |
| 35 | 1442 |

# User Growth

Your task: Calculate the user growth for product.

Query :

```
select year_num, week_num, num_active_users,
SUM(num_active_users)OVER(ORDER BY year_num,
week_num ROWS BETWEEN UNBOUNDED PRECEDING AND
CURRENT ROW) AS cum_active_users from ( select extract
(year from a.activated_at) as year_num, extract (week from
a.activated_at) as week_num, count(distinct user_id) as
num_active_users from tutorial.yammer_users a WHERE state =
'active' group by year_num,week_num order by
year_num,week_num ) a;
```

# RESULT

| year_num | week_num | num_active_users | cum_active_users |
|---|---|---|---|
| 2013 | 1 | 67 | 67 |
| 2013 | 2 | 29 | 96 |
| 2013 | 3 | 47 | 143 |
| 2013 | 4 | 36 | 179 |
| 2013 | 5 | 30 | 209 |
| 2013 | 6 | 48 | 257 |
| 2013 | 7 | 41 | 298 |
| 2013 | 8 | 39 | 337 |
| 2013 | 9 | 33 | 370 |
| 2013 | 10 | 43 | 413 |
| 2013 | 11 | 33 | 446 |
| 2013 | 12 | 32 | 478 |
| 2013 | 13 | 33 | 511 |
| 2013 | 14 | 40 | 551 |
| 2013 | 15 | 35 | 586 |
| 2013 | 16 | 42 | 628 |
| 2013 | 17 | 48 | 676 |
| 2013 | 18 | 48 | 724 |
| 2013 | 19 | 45 | 769 |
| 2013 | 20 | 55 | 824 |
| 2013 | 21 | 41 | 865 |
| 2013 | 22 | 49 | 914 |
| 2013 | 23 | 51 | 965 |
| 2013 | 24 | 51 | 1016 |
| 2013 | 25 | 46 | 1062 |
| 2013 | 26 | 57 | 1119 |
| 2013 | 27 | 57 | 1176 |
| 2013 | 28 | 52 | 1228 |
| 2013 | 29 | 71 | 1299 |
| 2013 | 30 | 66 | 1365 |
| 2013 | 31 | 69 | 1434 |
| 2013 | 32 | 66 | 1500 |
| 2013 | 33 | 73 | 1573 |
| 2013 | 34 | 70 | 1643 |
| 2013 | 35 | 80 | 1723 |
| 2013 | 36 | 65 | 1788 |
| 2013 | 37 | 71 | 1859 |
| 2013 | 38 | 84 | 1943 |
| 2013 | 39 | 92 | 2035 |
| 2013 | 40 | 81 | 2116 |
| 2013 | 41 | 88 | 2204 |
| 2013 | 42 | 74 | 2278 |
| 2013 | 43 | 97 | 2375 |
| 2013 | 44 | 92 | 2467 |
| 2013 | 45 | 97 | 2564 |
| 2013 | 46 | 94 | 2658 |
| 2013 | 47 | 82 | 2740 |
| 2013 | 48 | 103 | 2843 |
| 2013 | 49 | 96 | 2939 |
| 2013 | 50 | 117 | 3056 |
| 2013 | 51 | 123 | 3179 |
| 2013 | 52 | 104 | 3283 |
| 2014 | 1 | 91 | 3374 |
| 2014 | 2 | 122 | 3496 |
| 2014 | 3 | 112 | 3608 |
| 2014 | 4 | 113 | 3721 |
| 2014 | 5 | 130 | 3851 |
| 2014 | 6 | 132 | 3983 |
| 2014 | 7 | 135 | 4118 |
| 2014 | 8 | 127 | 4245 |
| 2014 | 9 | 127 | 4372 |
| 2014 | 10 | 135 | 4507 |
| 2014 | 11 | 152 | 4659 |
| 2014 | 12 | 132 | 4791 |
| 2014 | 13 | 151 | 4942 |
| 2014 | 14 | 161 | 5103 |
| 2014 | 15 | 166 | 5269 |
| 2014 | 16 | 165 | 5434 |
| 2014 | 17 | 176 | 5610 |
| 2014 | 18 | 172 | 5782 |
| 2014 | 19 | 160 | 5942 |
| 2014 | 20 | 186 | 6128 |
| 2014 | 21 | 177 | 6305 |
| 2014 | 22 | 186 | 6491 |
| 2014 | 23 | 197 | 6688 |
| 2014 | 24 | 198 | 6886 |
| 2014 | 25 | 222 | 7108 |
| 2014 | 26 | 210 | 7318 |
| 2014 | 27 | 199 | 7517 |
| 2014 | 28 | 223 | 7740 |
| 2014 | 29 | 215 | 7955 |
| 2014 | 30 | 228 | 8183 |
| 2014 | 31 | 234 | 8417 |
| 2014 | 32 | 189 | 8606 |
| 2014 | 33 | 250 | 8856 |
| 2014 | 34 | 259 | 9115 |
| 2014 | 35 | 266 | 9381 |

# RESULT

Query :

```
select count(*) from tutorial.yammer_users where state = 'active';
```

Hence there are total : 9381

# WEEKLY RENTATION

Your task:  Calculate the weekly retention of users-sign up cohort.

Query :SELECT distinct user_id, COUNT(user_id), SUM(CASE WHEN retention_week = 1 Then 1 Else 0 END) as per_week_retention FROM ( SELECT a.user_id, a.signup_week, b.engagement_week, b.engagement_week - a.signup_week as retention_week FROM ( (SELECT distinct user_id, extract(week from occurred_at) as signup_week from tutorial.yammer_events WHERE event_type = 'signup_flow' and event_name = 'complete_signup' )a LEFT JOIN (SELECT distinct user_id, extract (week from occurred_at) as engagement_week FROM tutorial.yammer_events where event_type = 'engagement' )b on a.user_id = b.user_id ) )d group by user_id order by user_id

# RESULT

Here is the link of the result:
https://drive.google.com/file/d/1ds_oQpU6eojYLDlZMRvhw07Br2g2BAuO/view?usp=sharing

# WEEKLY ENGAGEMENT

Your task: Calculate the weekly engagement per device?

Query :

```
SELECT extract(year from occurred_at) as year_num,
extract(week from occurred_at) as week_num, device,
COUNT(distinct user_id) as no_of_users FROM
tutorial.yammer_events where event_type = 'engagement'
GROUP by 1,2,3 order by 1,2,3;
```

RESULT : https://drive.google.com/file/d/1xta_GsUjTJO4SkCG-pkxQ3DPV1GN8UC4/view?usp=drive_link

# EMAIL ENGAGEMENT

Your task: Calculate the email engagement metric.

Query :

```
SELECT 100.0*SUM(CASE when email_cat = 'email_opened' then 1 else 0 end)/SUM(CASE when email_cat = 'email_sent' then 1 else 0 end) as email_opening_rate, 100.0*SUM(CASE when email_cat = 'email_clicked' then 1 else 0 end)/SUM(CASE when email_cat = 'email_sent' then 1 else 0 end) as email_clicking_rate FROM ( SELECT *, CASE WHEN action in ('sent_weekly_digest','sent_reengagement_email') then 'email_sent' WHEN action in ('email_open') then 'email_opened' WHEN action in ('email_clickthrough') then 'email_clicked' end as email_cat from tutorial.yammer_emails ) a;
```

# RESULT

| email_opening_rate | email_clicking_rate |
| --- | --- |
| 33.58338805 | 14.78988838 |

# Thank you

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