**Operation Analytics and Investigating Metric Spike**

**Project Description:** This project isabout Operation Analytics and Investigating Metric Spike. I was asked to perform user analysis for a company like Microsoft designated as Data Analyst Lead and derive certain insights out of it and answer the questions asked by different departments. First it was required to create the database using dataset provided. Then it was required to perform analysis using SQL to answer the below questions:

**A) Case Study 1 (Job Data):**

1. Number of jobs reviewed: Amount of jobs reviewed over time.
2. Throughput: It is the no. of events happening per second.
3. Percentage share of each language: Share of each language for different contents.
4. Duplicate rows: Rows that have the same value present in them.

**B) Case Study 2 (Investigating metric spike):**

1. User Engagement: To measure the activeness of a user. Measuring if the user finds quality in a product/service.
2. User Growth: Amount of users growing over time for a product.
3. Weekly Retention: Users getting retained weekly after signing-up for a product.
4. Weekly Engagement: To measure the activeness of a user. Measuring if the user finds quality in a product/service weekly.
5. Email Engagement: Users engaging with the email service.

**Approach:** First Igone through all the datasets provided. After that, I created databases and tables according to the dataset provided. Below are the links of table creation:

[Job Data](https://drive.google.com/file/d/1HudJlshIL5oIwHfgt8p5VLySWVo-bVuW/view?usp=sharing)

[Investigating metric spike users](https://drive.google.com/file/d/1HzjfR6ZlP0S55WlVQWLU4J7RAU7OCIA2/view?usp=sharing)

[Investigating metric spike events](https://drive.google.com/file/d/12_Jj9FlXW3O6Z9_h7zDtlBWCQ6XwJNV7/view?usp=sharing)

[Investigating metric spike email-events](https://drive.google.com/file/d/1C2w0BDa3qdO5FsZdsBTRJ6vZp3vp05MF/view?usp=sharing)

Then I saw all the questions and thought of which tables could be used in each question. Then I wrote the sql queries for each question.

**Tech-Stack Used:** The software used for the project are MySQL workbench 8.0 CE and MS Excel 365. MySQL workbench 8.0 CE is used to run the sql queries and get answers of each question. MS Excel 365 is used to get output table and format date.

**Insights:**

**A) Case Study 1 (Job Data):**

1. Number of jobs reviewed:

In this, I was required to Calculate the number of jobs reviewed per hour per day for November 2020.

Sql query:

SELECT

ds,

ROUND((COUNT(job\_id) \* 3600) / SUM(time\_spent)) AS `number of jobs reviewed per hour per day`

FROM

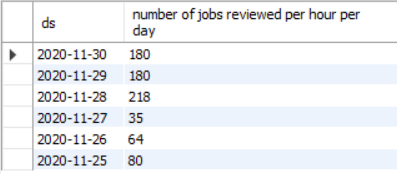
job\_data

WHERE

ds BETWEEN '2020-11-01' AND '2020-11-30'

GROUP BY ds;

Output:



1. Throughput:

In this, I was required to calculate 7 day rolling average of throughput.

Sql query:

SELECT

COUNT(job\_id) / SUM(time\_spent) AS `7 day rolling average of throughput`

FROM

job\_data;

SELECT

ds,

COUNT(job\_id) / SUM(time\_spent) AS `Daily rolling average of throughput`

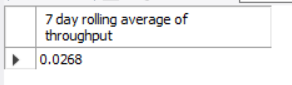
FROM

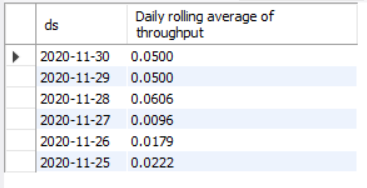
job\_data

GROUP BY

ds;

Output:





1. Percentage share of each language:

In this, I was required to calculate the percentage share of each language in the last 30 days.

Sql query:

SELECT

language,

COUNT(language)/total\*100 as `percentage share of language`

FROM

(SELECT

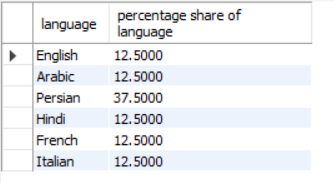
job\_id, actor\_id, language, COUNT(language) over() AS total

FROM

job\_data) AS a

GROUP BY language;

Output:



1. Duplicate rows:

In this I was required to display duplicates from the table.

Sql query:

SELECT

job\_id, COUNT(job\_id) AS duplicates

FROM

job\_data

GROUP BY job\_id

HAVING COUNT(job\_id) > 1;

Output:



**B) Case Study 2 (Investigating metric spike):**

1. User Engagement: Calculate the weekly user engagement

Sql query:

SELECT

EXTRACT(WEEK FROM occurred\_at) AS week\_no,

COUNT(DISTINCT user\_id) AS `weekly user engagement`

FROM

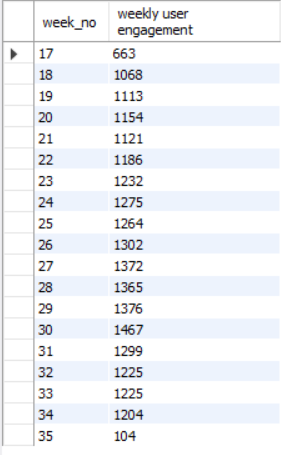
events

WHERE

event\_type = 'engagement'

GROUP BY 1;

Output:



1. User Growth: Calculate the user growth for product

Sql query:

SELECT

month\_no,

users\_registered,

users\_registered - LAG(users\_registered) over() AS `growth in terms of users`

FROM

(SELECT

EXTRACT(MONTH FROM activated\_at) AS month\_no,

COUNT(activated\_at) AS users\_registered

FROM

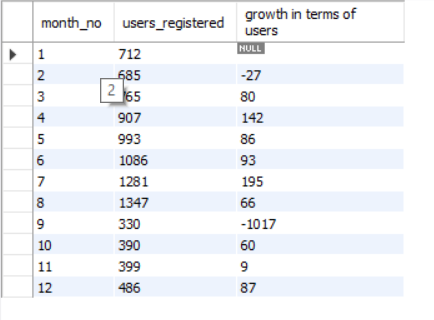
users

WHERE

activated\_at <> ''

GROUP BY 1) AS a;

Output:



1. Weekly Retention:

Calculate the weekly retention of users-sign up cohort?

Sql Query:

SELECT

b.login\_week,

a.post\_week - b.login\_week AS post\_week\_after\_login,

COUNT(\*) AS `weekly retention of users-sign up cohort`

FROM

(SELECT

user\_id, EXTRACT(WEEK FROM occurred\_at) AS post\_week

FROM

events

GROUP BY 1, 2) a,

(SELECT

user\_id, MIN(EXTRACT(WEEK FROM occurred\_at)) AS login\_week

FROM

events

GROUP BY 1) b

WHERE

a.user\_id = b.user\_id

GROUP BY 1 , 2

ORDER BY 1;

Output:

|  |  |  |
| --- | --- | --- |
| **login\_week** | **post\_week\_after\_login** | **weekly retention of users-sign up cohort** |
| 17 | 0 | 740 |
| 17 | 1 | 472 |
| 17 | 2 | 324 |
| 17 | 3 | 251 |
| 17 | 4 | 205 |
| 17 | 5 | 187 |
| 17 | 6 | 167 |
| 17 | 7 | 146 |
| 17 | 8 | 145 |
| 17 | 9 | 145 |
| 17 | 10 | 136 |
| 17 | 11 | 131 |
| 17 | 12 | 132 |
| 17 | 13 | 143 |
| 17 | 14 | 116 |
| 17 | 15 | 91 |
| 17 | 16 | 82 |
| 17 | 17 | 77 |
| 17 | 18 | 5 |
| 18 | 0 | 788 |
| 18 | 1 | 362 |
| 18 | 2 | 261 |
| 18 | 3 | 203 |
| 18 | 4 | 168 |
| 18 | 5 | 147 |
| 18 | 6 | 144 |
| 18 | 7 | 127 |
| 18 | 8 | 113 |
| 18 | 9 | 122 |
| 18 | 10 | 106 |
| 18 | 11 | 118 |
| 18 | 12 | 127 |
| 18 | 13 | 110 |
| 18 | 14 | 97 |
| 18 | 15 | 85 |
| 18 | 16 | 67 |
| 18 | 17 | 4 |
| 19 | 0 | 601 |
| 19 | 1 | 284 |
| 19 | 2 | 173 |
| 19 | 3 | 153 |
| 19 | 4 | 114 |
| 19 | 5 | 95 |
| 19 | 6 | 91 |
| 19 | 7 | 81 |
| 19 | 8 | 95 |
| 19 | 9 | 82 |
| 19 | 10 | 68 |
| 19 | 11 | 65 |
| 19 | 12 | 63 |
| 19 | 13 | 42 |
| 19 | 14 | 51 |
| 19 | 15 | 49 |
| 19 | 16 | 2 |
| 20 | 0 | 555 |
| 20 | 1 | 223 |
| 20 | 2 | 165 |
| 20 | 3 | 121 |
| 20 | 4 | 91 |
| 20 | 5 | 72 |
| 20 | 6 | 63 |
| 20 | 7 | 67 |
| 20 | 8 | 63 |
| 20 | 9 | 65 |
| 20 | 10 | 67 |
| 20 | 11 | 41 |
| 20 | 12 | 40 |
| 20 | 13 | 33 |
| 20 | 14 | 40 |
| 21 | 0 | 495 |
| 21 | 1 | 187 |
| 21 | 2 | 131 |
| 21 | 3 | 91 |
| 21 | 4 | 74 |
| 21 | 5 | 63 |
| 21 | 6 | 75 |
| 21 | 7 | 72 |
| 21 | 8 | 58 |
| 21 | 9 | 48 |
| 21 | 10 | 45 |
| 21 | 11 | 39 |
| 21 | 12 | 35 |
| 21 | 13 | 28 |
| 21 | 14 | 2 |
| 22 | 0 | 521 |
| 22 | 1 | 224 |
| 22 | 2 | 150 |
| 22 | 3 | 107 |
| 22 | 4 | 87 |
| 22 | 5 | 73 |
| 22 | 6 | 63 |
| 22 | 7 | 60 |
| 22 | 8 | 55 |
| 22 | 9 | 48 |
| 22 | 10 | 41 |
| 22 | 11 | 39 |
| 22 | 12 | 31 |
| 22 | 13 | 1 |
| 23 | 0 | 542 |
| 23 | 1 | 219 |
| 23 | 2 | 138 |
| 23 | 3 | 101 |
| 23 | 4 | 90 |
| 23 | 5 | 79 |
| 23 | 6 | 69 |
| 23 | 7 | 61 |
| 23 | 8 | 54 |
| 23 | 9 | 47 |
| 23 | 10 | 35 |
| 23 | 11 | 30 |
| 24 | 0 | 535 |
| 24 | 1 | 205 |
| 24 | 2 | 143 |
| 24 | 3 | 102 |
| 24 | 4 | 81 |
| 24 | 5 | 63 |
| 24 | 6 | 65 |
| 24 | 7 | 61 |
| 24 | 8 | 38 |
| 24 | 9 | 39 |
| 24 | 10 | 29 |
| 25 | 0 | 500 |
| 25 | 1 | 218 |
| 25 | 2 | 139 |
| 25 | 3 | 101 |
| 25 | 4 | 75 |
| 25 | 5 | 63 |
| 25 | 6 | 50 |
| 25 | 7 | 46 |
| 25 | 8 | 38 |
| 25 | 9 | 35 |
| 25 | 10 | 2 |
| 26 | 0 | 495 |
| 26 | 1 | 181 |
| 26 | 2 | 114 |
| 26 | 3 | 83 |
| 26 | 4 | 73 |
| 26 | 5 | 55 |
| 26 | 6 | 47 |
| 26 | 7 | 43 |
| 26 | 8 | 29 |
| 27 | 0 | 493 |
| 27 | 1 | 199 |
| 27 | 2 | 121 |
| 27 | 3 | 106 |
| 27 | 4 | 68 |
| 27 | 5 | 53 |
| 27 | 6 | 40 |
| 27 | 7 | 36 |
| 27 | 8 | 1 |
| 28 | 0 | 486 |
| 28 | 1 | 194 |
| 28 | 2 | 114 |
| 28 | 3 | 69 |
| 28 | 4 | 46 |
| 28 | 5 | 30 |
| 28 | 6 | 28 |
| 28 | 7 | 3 |
| 29 | 0 | 501 |
| 29 | 1 | 186 |
| 29 | 2 | 102 |
| 29 | 3 | 65 |
| 29 | 4 | 47 |
| 29 | 5 | 40 |
| 29 | 6 | 1 |
| 30 | 0 | 533 |
| 30 | 1 | 202 |
| 30 | 2 | 121 |
| 30 | 3 | 78 |
| 30 | 4 | 53 |
| 30 | 5 | 3 |
| 31 | 0 | 430 |
| 31 | 1 | 145 |
| 31 | 2 | 76 |
| 31 | 3 | 57 |
| 31 | 4 | 1 |
| 32 | 0 | 496 |
| 32 | 1 | 188 |
| 32 | 2 | 94 |
| 32 | 3 | 8 |
| 33 | 0 | 499 |
| 33 | 1 | 202 |
| 33 | 2 | 9 |
| 34 | 0 | 518 |
| 34 | 1 | 44 |
| 35 | 0 | 32 |

1. Weekly Engagement:

Calculate the weekly engagement per device?

Sql Query:

SELECT

EXTRACT(WEEK FROM occurred\_at) AS week\_no,

device,

COUNT(\*) AS `weekly engagement per device`

FROM

events

WHERE

event\_type = 'engagement'

GROUP BY 1 , 2

ORDER BY 1;

Output:

|  |  |  |
| --- | --- | --- |
| **week\_no** | **device** | **weekly engagement per device** |
| 17 | acer aspire desktop | 67 |
| 17 | acer aspire notebook | 206 |
| 17 | amazon fire phone | 83 |
| 17 | asus chromebook | 251 |
| 17 | dell inspiron desktop | 187 |
| 17 | dell inspiron notebook | 503 |
| 17 | hp pavilion desktop | 132 |
| 17 | htc one | 190 |
| 17 | ipad air | 330 |
| 17 | ipad mini | 205 |
| 17 | iphone 4s | 217 |
| 17 | iphone 5 | 706 |
| 17 | iphone 5s | 473 |
| 17 | kindle fire | 57 |
| 17 | lenovo thinkpad | 793 |
| 17 | mac mini | 59 |
| 17 | macbook air | 490 |
| 17 | macbook pro | 1516 |
| 17 | nexus 10 | 145 |
| 17 | nexus 5 | 382 |
| 17 | nexus 7 | 177 |
| 17 | nokia lumia 635 | 128 |
| 17 | samsumg galaxy tablet | 70 |
| 17 | samsung galaxy note | 116 |
| 17 | samsung galaxy s4 | 449 |
| 17 | windows surface | 87 |
| 18 | acer aspire desktop | 295 |
| 18 | acer aspire notebook | 363 |
| 18 | amazon fire phone | 177 |
| 18 | asus chromebook | 523 |
| 18 | dell inspiron desktop | 683 |
| 18 | dell inspiron notebook | 953 |
| 18 | hp pavilion desktop | 373 |
| 18 | htc one | 174 |
| 18 | ipad air | 520 |
| 18 | ipad mini | 309 |
| 18 | iphone 4s | 448 |
| 18 | iphone 5 | 1328 |
| 18 | iphone 5s | 778 |
| 18 | kindle fire | 265 |
| 18 | lenovo thinkpad | 1732 |
| 18 | mac mini | 159 |
| 18 | macbook air | 1604 |
| 18 | macbook pro | 3301 |
| 18 | nexus 10 | 370 |
| 18 | nexus 5 | 938 |
| 18 | nexus 7 | 252 |
| 18 | nokia lumia 635 | 341 |
| 18 | samsumg galaxy tablet | 79 |
| 18 | samsung galaxy note | 139 |
| 18 | samsung galaxy s4 | 1130 |
| 18 | windows surface | 107 |
| 19 | acer aspire desktop | 242 |
| 19 | acer aspire notebook | 406 |
| 19 | amazon fire phone | 141 |
| 19 | asus chromebook | 268 |
| 19 | dell inspiron desktop | 444 |
| 19 | dell inspiron notebook | 1193 |
| 19 | hp pavilion desktop | 376 |
| 19 | htc one | 270 |
| 19 | ipad air | 595 |
| 19 | ipad mini | 381 |
| 19 | iphone 4s | 546 |
| 19 | iphone 5 | 1190 |
| 19 | iphone 5s | 964 |
| 19 | kindle fire | 225 |
| 19 | lenovo thinkpad | 2143 |
| 19 | mac mini | 255 |
| 19 | macbook air | 1331 |
| 19 | macbook pro | 3159 |
| 19 | nexus 10 | 232 |
| 19 | nexus 5 | 944 |
| 19 | nexus 7 | 334 |
| 19 | nokia lumia 635 | 215 |
| 19 | samsumg galaxy tablet | 66 |
| 19 | samsung galaxy note | 117 |
| 19 | samsung galaxy s4 | 1024 |
| 19 | windows surface | 163 |
| 20 | acer aspire desktop | 226 |
| 20 | acer aspire notebook | 483 |
| 20 | amazon fire phone | 104 |
| 20 | asus chromebook | 461 |
| 20 | dell inspiron desktop | 504 |
| 20 | dell inspiron notebook | 975 |
| 20 | hp pavilion desktop | 276 |
| 20 | htc one | 365 |
| 20 | ipad air | 611 |
| 20 | ipad mini | 264 |
| 20 | iphone 4s | 608 |
| 20 | iphone 5 | 1302 |
| 20 | iphone 5s | 1024 |
| 20 | kindle fire | 242 |
| 20 | lenovo thinkpad | 2203 |
| 20 | mac mini | 272 |
| 20 | macbook air | 1443 |
| 20 | macbook pro | 3097 |
| 20 | nexus 10 | 217 |
| 20 | nexus 5 | 1278 |
| 20 | nexus 7 | 372 |
| 20 | nokia lumia 635 | 151 |
| 20 | samsumg galaxy tablet | 78 |
| 20 | samsung galaxy note | 160 |
| 20 | samsung galaxy s4 | 1001 |
| 20 | windows surface | 194 |
| 21 | acer aspire desktop | 328 |
| 21 | acer aspire notebook | 462 |
| 21 | amazon fire phone | 29 |
| 21 | asus chromebook | 550 |
| 21 | dell inspiron desktop | 568 |
| 21 | dell inspiron notebook | 955 |
| 21 | hp pavilion desktop | 475 |
| 21 | htc one | 260 |
| 21 | ipad air | 428 |
| 21 | ipad mini | 280 |
| 21 | iphone 4s | 522 |
| 21 | iphone 5 | 1567 |
| 21 | iphone 5s | 804 |
| 21 | kindle fire | 355 |
| 21 | lenovo thinkpad | 1893 |
| 21 | mac mini | 281 |
| 21 | macbook air | 1269 |
| 21 | macbook pro | 3044 |
| 21 | nexus 10 | 258 |
| 21 | nexus 5 | 1020 |
| 21 | nexus 7 | 211 |
| 21 | nokia lumia 635 | 190 |
| 21 | samsumg galaxy tablet | 63 |
| 21 | samsung galaxy note | 196 |
| 21 | samsung galaxy s4 | 960 |
| 21 | windows surface | 183 |
| 22 | acer aspire desktop | 255 |
| 22 | acer aspire notebook | 431 |
| 22 | amazon fire phone | 46 |
| 22 | asus chromebook | 631 |
| 22 | dell inspiron desktop | 737 |
| 22 | dell inspiron notebook | 1011 |
| 22 | hp pavilion desktop | 371 |
| 22 | htc one | 323 |
| 22 | ipad air | 591 |
| 22 | ipad mini | 342 |
| 22 | iphone 4s | 477 |
| 22 | iphone 5 | 1394 |
| 22 | iphone 5s | 920 |
| 22 | kindle fire | 231 |
| 22 | lenovo thinkpad | 1803 |
| 22 | mac mini | 276 |
| 22 | macbook air | 1714 |
| 22 | macbook pro | 3046 |
| 22 | nexus 10 | 311 |
| 22 | nexus 5 | 1231 |
| 22 | nexus 7 | 433 |
| 22 | nokia lumia 635 | 308 |
| 22 | samsumg galaxy tablet | 70 |
| 22 | samsung galaxy note | 252 |
| 22 | samsung galaxy s4 | 1020 |
| 22 | windows surface | 189 |
| 23 | acer aspire desktop | 240 |
| 23 | acer aspire notebook | 449 |
| 23 | amazon fire phone | 181 |
| 23 | asus chromebook | 671 |
| 23 | dell inspiron desktop | 494 |
| 23 | dell inspiron notebook | 1034 |
| 23 | hp pavilion desktop | 655 |
| 23 | htc one | 234 |
| 23 | ipad air | 404 |
| 23 | ipad mini | 258 |
| 23 | iphone 4s | 459 |
| 23 | iphone 5 | 1748 |
| 23 | iphone 5s | 859 |
| 23 | kindle fire | 352 |
| 23 | lenovo thinkpad | 1882 |
| 23 | mac mini | 170 |
| 23 | macbook air | 1431 |
| 23 | macbook pro | 3123 |
| 23 | nexus 10 | 533 |
| 23 | nexus 5 | 997 |
| 23 | nexus 7 | 303 |
| 23 | nokia lumia 635 | 273 |
| 23 | samsumg galaxy tablet | 98 |
| 23 | samsung galaxy note | 183 |
| 23 | samsung galaxy s4 | 1094 |
| 23 | windows surface | 155 |
| 24 | acer aspire desktop | 289 |
| 24 | acer aspire notebook | 509 |
| 24 | amazon fire phone | 147 |
| 24 | asus chromebook | 471 |
| 24 | dell inspiron desktop | 713 |
| 24 | dell inspiron notebook | 1082 |
| 24 | hp pavilion desktop | 721 |
| 24 | htc one | 136 |
| 24 | ipad air | 619 |
| 24 | ipad mini | 313 |
| 24 | iphone 4s | 609 |
| 24 | iphone 5 | 1475 |
| 24 | iphone 5s | 959 |
| 24 | kindle fire | 239 |
| 24 | lenovo thinkpad | 1806 |
| 24 | mac mini | 298 |
| 24 | macbook air | 1716 |
| 24 | macbook pro | 3028 |
| 24 | nexus 10 | 369 |
| 24 | nexus 5 | 1151 |
| 24 | nexus 7 | 418 |
| 24 | nokia lumia 635 | 489 |
| 24 | samsumg galaxy tablet | 101 |
| 24 | samsung galaxy note | 245 |
| 24 | samsung galaxy s4 | 940 |
| 24 | windows surface | 209 |
| 25 | acer aspire desktop | 263 |
| 25 | acer aspire notebook | 605 |
| 25 | amazon fire phone | 131 |
| 25 | asus chromebook | 432 |
| 25 | dell inspiron desktop | 644 |
| 25 | dell inspiron notebook | 1209 |
| 25 | hp pavilion desktop | 588 |
| 25 | htc one | 285 |
| 25 | ipad air | 640 |
| 25 | ipad mini | 234 |
| 25 | iphone 4s | 442 |
| 25 | iphone 5 | 1645 |
| 25 | iphone 5s | 963 |
| 25 | kindle fire | 209 |
| 25 | lenovo thinkpad | 2096 |
| 25 | mac mini | 230 |
| 25 | macbook air | 1269 |
| 25 | macbook pro | 2932 |
| 25 | nexus 10 | 258 |
| 25 | nexus 5 | 935 |
| 25 | nexus 7 | 557 |
| 25 | nokia lumia 635 | 446 |
| 25 | samsumg galaxy tablet | 159 |
| 25 | samsung galaxy note | 134 |
| 25 | samsung galaxy s4 | 1102 |
| 25 | windows surface | 234 |
| 26 | acer aspire desktop | 313 |
| 26 | acer aspire notebook | 328 |
| 26 | amazon fire phone | 137 |
| 26 | asus chromebook | 632 |
| 26 | dell inspiron desktop | 672 |
| 26 | dell inspiron notebook | 1077 |
| 26 | hp pavilion desktop | 512 |
| 26 | htc one | 225 |
| 26 | ipad air | 580 |
| 26 | ipad mini | 464 |
| 26 | iphone 4s | 503 |
| 26 | iphone 5 | 1602 |
| 26 | iphone 5s | 1026 |
| 26 | kindle fire | 254 |
| 26 | lenovo thinkpad | 2214 |
| 26 | mac mini | 140 |
| 26 | macbook air | 1489 |
| 26 | macbook pro | 3309 |
| 26 | nexus 10 | 261 |
| 26 | nexus 5 | 912 |
| 26 | nexus 7 | 428 |
| 26 | nokia lumia 635 | 456 |
| 26 | samsumg galaxy tablet | 139 |
| 26 | samsung galaxy note | 97 |
| 26 | samsung galaxy s4 | 1114 |
| 26 | windows surface | 177 |
| 27 | acer aspire desktop | 296 |
| 27 | acer aspire notebook | 582 |
| 27 | amazon fire phone | 109 |
| 27 | asus chromebook | 510 |
| 27 | dell inspiron desktop | 541 |
| 27 | dell inspiron notebook | 992 |
| 27 | hp pavilion desktop | 589 |
| 27 | htc one | 225 |
| 27 | ipad air | 482 |
| 27 | ipad mini | 344 |
| 27 | iphone 4s | 720 |
| 27 | iphone 5 | 1867 |
| 27 | iphone 5s | 952 |
| 27 | kindle fire | 268 |
| 27 | lenovo thinkpad | 2233 |
| 27 | mac mini | 169 |
| 27 | macbook air | 1652 |
| 27 | macbook pro | 3548 |
| 27 | nexus 10 | 320 |
| 27 | nexus 5 | 1015 |
| 27 | nexus 7 | 366 |
| 27 | nokia lumia 635 | 325 |
| 27 | samsumg galaxy tablet | 146 |
| 27 | samsung galaxy note | 131 |
| 27 | samsung galaxy s4 | 1154 |
| 27 | windows surface | 345 |
| 28 | acer aspire desktop | 303 |
| 28 | acer aspire notebook | 541 |
| 28 | amazon fire phone | 51 |
| 28 | asus chromebook | 511 |
| 28 | dell inspiron desktop | 744 |
| 28 | dell inspiron notebook | 1183 |
| 28 | hp pavilion desktop | 622 |
| 28 | htc one | 318 |
| 28 | ipad air | 547 |
| 28 | ipad mini | 364 |
| 28 | iphone 4s | 783 |
| 28 | iphone 5 | 1654 |
| 28 | iphone 5s | 1039 |
| 28 | kindle fire | 342 |
| 28 | lenovo thinkpad | 2564 |
| 28 | mac mini | 340 |
| 28 | macbook air | 1671 |
| 28 | macbook pro | 3461 |
| 28 | nexus 10 | 261 |
| 28 | nexus 5 | 946 |
| 28 | nexus 7 | 342 |
| 28 | nokia lumia 635 | 405 |
| 28 | samsumg galaxy tablet | 102 |
| 28 | samsung galaxy note | 118 |
| 28 | samsung galaxy s4 | 1260 |
| 28 | windows surface | 304 |
| 29 | acer aspire desktop | 212 |
| 29 | acer aspire notebook | 592 |
| 29 | amazon fire phone | 92 |
| 29 | asus chromebook | 529 |
| 29 | dell inspiron desktop | 560 |
| 29 | dell inspiron notebook | 1179 |
| 29 | hp pavilion desktop | 742 |
| 29 | htc one | 227 |
| 29 | ipad air | 620 |
| 29 | ipad mini | 364 |
| 29 | iphone 4s | 605 |
| 29 | iphone 5 | 1593 |
| 29 | iphone 5s | 932 |
| 29 | kindle fire | 293 |
| 29 | lenovo thinkpad | 2438 |
| 29 | mac mini | 342 |
| 29 | macbook air | 1691 |
| 29 | macbook pro | 3155 |
| 29 | nexus 10 | 272 |
| 29 | nexus 5 | 793 |
| 29 | nexus 7 | 392 |
| 29 | nokia lumia 635 | 461 |
| 29 | samsumg galaxy tablet | 120 |
| 29 | samsung galaxy note | 141 |
| 29 | samsung galaxy s4 | 1462 |
| 29 | windows surface | 260 |
| 30 | acer aspire desktop | 403 |
| 30 | acer aspire notebook | 646 |
| 30 | amazon fire phone | 170 |
| 30 | asus chromebook | 565 |
| 30 | dell inspiron desktop | 685 |
| 30 | dell inspiron notebook | 1488 |
| 30 | hp pavilion desktop | 466 |
| 30 | htc one | 306 |
| 30 | ipad air | 656 |
| 30 | ipad mini | 373 |
| 30 | iphone 4s | 740 |
| 30 | iphone 5 | 1535 |
| 30 | iphone 5s | 1164 |
| 30 | kindle fire | 234 |
| 30 | lenovo thinkpad | 2584 |
| 30 | mac mini | 316 |
| 30 | macbook air | 1731 |
| 30 | macbook pro | 3578 |
| 30 | nexus 10 | 282 |
| 30 | nexus 5 | 983 |
| 30 | nexus 7 | 629 |
| 30 | nokia lumia 635 | 333 |
| 30 | samsumg galaxy tablet | 137 |
| 30 | samsung galaxy note | 156 |
| 30 | samsung galaxy s4 | 1203 |
| 30 | windows surface | 170 |
| 31 | acer aspire desktop | 383 |
| 31 | acer aspire notebook | 554 |
| 31 | amazon fire phone | 157 |
| 31 | asus chromebook | 636 |
| 31 | dell inspiron desktop | 465 |
| 31 | dell inspiron notebook | 1242 |
| 31 | hp pavilion desktop | 601 |
| 31 | htc one | 117 |
| 31 | ipad air | 573 |
| 31 | ipad mini | 240 |
| 31 | iphone 4s | 631 |
| 31 | iphone 5 | 1491 |
| 31 | iphone 5s | 663 |
| 31 | kindle fire | 136 |
| 31 | lenovo thinkpad | 2114 |
| 31 | mac mini | 232 |
| 31 | macbook air | 1574 |
| 31 | macbook pro | 3608 |
| 31 | nexus 10 | 274 |
| 31 | nexus 5 | 684 |
| 31 | nexus 7 | 407 |
| 31 | nokia lumia 635 | 298 |
| 31 | samsumg galaxy tablet | 80 |
| 31 | samsung galaxy note | 112 |
| 31 | samsung galaxy s4 | 1068 |
| 31 | windows surface | 216 |
| 32 | acer aspire desktop | 354 |
| 32 | acer aspire notebook | 580 |
| 32 | amazon fire phone | 161 |
| 32 | asus chromebook | 611 |
| 32 | dell inspiron desktop | 519 |
| 32 | dell inspiron notebook | 1229 |
| 32 | hp pavilion desktop | 549 |
| 32 | htc one | 146 |
| 32 | ipad air | 463 |
| 32 | ipad mini | 257 |
| 32 | iphone 4s | 318 |
| 32 | iphone 5 | 1301 |
| 32 | iphone 5s | 775 |
| 32 | kindle fire | 67 |
| 32 | lenovo thinkpad | 1898 |
| 32 | mac mini | 120 |
| 32 | macbook air | 1265 |
| 32 | macbook pro | 3320 |
| 32 | nexus 10 | 318 |
| 32 | nexus 5 | 678 |
| 32 | nexus 7 | 235 |
| 32 | nokia lumia 635 | 357 |
| 32 | samsumg galaxy tablet | 77 |
| 32 | samsung galaxy note | 116 |
| 32 | samsung galaxy s4 | 812 |
| 32 | windows surface | 86 |
| 33 | acer aspire desktop | 363 |
| 33 | acer aspire notebook | 498 |
| 33 | amazon fire phone | 114 |
| 33 | asus chromebook | 581 |
| 33 | dell inspiron desktop | 408 |
| 33 | dell inspiron notebook | 1011 |
| 33 | hp pavilion desktop | 379 |
| 33 | htc one | 138 |
| 33 | ipad air | 376 |
| 33 | ipad mini | 260 |
| 33 | iphone 4s | 349 |
| 33 | iphone 5 | 1203 |
| 33 | iphone 5s | 712 |
| 33 | kindle fire | 120 |
| 33 | lenovo thinkpad | 2156 |
| 33 | mac mini | 331 |
| 33 | macbook air | 1622 |
| 33 | macbook pro | 3182 |
| 33 | nexus 10 | 163 |
| 33 | nexus 5 | 641 |
| 33 | nexus 7 | 255 |
| 33 | nokia lumia 635 | 215 |
| 33 | samsumg galaxy tablet | 82 |
| 33 | samsung galaxy note | 127 |
| 33 | samsung galaxy s4 | 729 |
| 33 | windows surface | 130 |
| 34 | acer aspire desktop | 281 |
| 34 | acer aspire notebook | 561 |
| 34 | amazon fire phone | 106 |
| 34 | asus chromebook | 557 |
| 34 | dell inspiron desktop | 465 |
| 34 | dell inspiron notebook | 1088 |
| 34 | hp pavilion desktop | 351 |
| 34 | htc one | 271 |
| 34 | ipad air | 306 |
| 34 | ipad mini | 252 |
| 34 | iphone 4s | 472 |
| 34 | iphone 5 | 966 |
| 34 | iphone 5s | 715 |
| 34 | kindle fire | 119 |
| 34 | lenovo thinkpad | 1908 |
| 34 | mac mini | 395 |
| 34 | macbook air | 1456 |
| 34 | macbook pro | 3141 |
| 34 | nexus 10 | 208 |
| 34 | nexus 5 | 770 |
| 34 | nexus 7 | 328 |
| 34 | nokia lumia 635 | 151 |
| 34 | samsumg galaxy tablet | 119 |
| 34 | samsung galaxy note | 96 |
| 34 | samsung galaxy s4 | 885 |
| 34 | windows surface | 160 |
| 35 | acer aspire desktop | 7 |
| 35 | acer aspire notebook | 28 |
| 35 | asus chromebook | 38 |
| 35 | dell inspiron desktop | 4 |
| 35 | dell inspiron notebook | 66 |
| 35 | hp pavilion desktop | 10 |
| 35 | htc one | 18 |
| 35 | ipad mini | 21 |
| 35 | iphone 4s | 57 |
| 35 | iphone 5 | 9 |
| 35 | iphone 5s | 22 |
| 35 | kindle fire | 32 |
| 35 | lenovo thinkpad | 123 |
| 35 | mac mini | 25 |
| 35 | macbook air | 64 |
| 35 | macbook pro | 122 |
| 35 | nexus 10 | 15 |
| 35 | nexus 5 | 34 |
| 35 | nexus 7 | 17 |
| 35 | nokia lumia 635 | 7 |
| 35 | samsung galaxy note | 6 |
| 35 | samsung galaxy s4 | 29 |
| 35 | windows surface | 30 |

1. Email Engagement:

Calculate the email engagement metrics?

Sql Query:

SELECT

week\_no,

action,

occurence,

ROUND(occurence \* 100 / SUM(occurence) over(partition by week\_no), 2) as `Weekly Percentage Share`

FROM

(SELECT

EXTRACT(WEEK FROM occurred\_at) AS week\_no,

action,

COUNT(user\_id) AS occurence

FROM

email\_events

GROUP BY 1 , 2

ORDER BY 1) AS a;

Output:

|  |  |  |  |
| --- | --- | --- | --- |
| **week\_no** | **action** | **occurence** | **Weekly Percentage Share** |
| 17 | email\_clickthrough | 166 | 11.39 |
| 17 | email\_open | 310 | 21.28 |
| 17 | sent\_reengagement\_email | 73 | 5.01 |
| 17 | sent\_weekly\_digest | 908 | 62.32 |
| 18 | email\_clickthrough | 430 | 10.49 |
| 18 | email\_open | 912 | 22.24 |
| 18 | sent\_reengagement\_email | 157 | 3.83 |
| 18 | sent\_weekly\_digest | 2602 | 63.45 |
| 19 | email\_clickthrough | 477 | 11.13 |
| 19 | email\_open | 972 | 22.67 |
| 19 | sent\_reengagement\_email | 173 | 4.04 |
| 19 | sent\_weekly\_digest | 2665 | 62.16 |
| 20 | email\_clickthrough | 507 | 11.43 |
| 20 | email\_open | 1004 | 22.64 |
| 20 | sent\_reengagement\_email | 191 | 4.31 |
| 20 | sent\_weekly\_digest | 2733 | 61.62 |
| 21 | email\_clickthrough | 443 | 9.97 |
| 21 | email\_open | 1014 | 22.82 |
| 21 | sent\_reengagement\_email | 164 | 3.69 |
| 21 | sent\_weekly\_digest | 2822 | 63.52 |
| 22 | email\_clickthrough | 488 | 10.66 |
| 22 | email\_open | 987 | 21.56 |
| 22 | sent\_reengagement\_email | 192 | 4.19 |
| 22 | sent\_weekly\_digest | 2911 | 63.59 |
| 23 | email\_clickthrough | 538 | 11.18 |
| 23 | email\_open | 1075 | 22.34 |
| 23 | sent\_reengagement\_email | 197 | 4.09 |
| 23 | sent\_weekly\_digest | 3003 | 62.39 |
| 24 | email\_clickthrough | 554 | 10.99 |
| 24 | email\_open | 1155 | 22.92 |
| 24 | sent\_reengagement\_email | 226 | 4.48 |
| 24 | sent\_weekly\_digest | 3105 | 61.61 |
| 25 | email\_clickthrough | 530 | 10.54 |
| 25 | email\_open | 1096 | 21.79 |
| 25 | sent\_reengagement\_email | 196 | 3.9 |
| 25 | sent\_weekly\_digest | 3207 | 63.77 |
| 26 | email\_clickthrough | 556 | 10.61 |
| 26 | email\_open | 1165 | 22.22 |
| 26 | sent\_reengagement\_email | 219 | 4.18 |
| 26 | sent\_weekly\_digest | 3302 | 62.99 |
| 27 | email\_clickthrough | 621 | 11.37 |
| 27 | email\_open | 1228 | 22.49 |
| 27 | sent\_reengagement\_email | 213 | 3.9 |
| 27 | sent\_weekly\_digest | 3399 | 62.24 |
| 28 | email\_clickthrough | 599 | 10.77 |
| 28 | email\_open | 1250 | 22.48 |
| 28 | sent\_reengagement\_email | 213 | 3.83 |
| 28 | sent\_weekly\_digest | 3499 | 62.92 |
| 29 | email\_clickthrough | 590 | 10.51 |
| 29 | email\_open | 1219 | 21.71 |
| 29 | sent\_reengagement\_email | 213 | 3.79 |
| 29 | sent\_weekly\_digest | 3592 | 63.98 |
| 30 | email\_clickthrough | 630 | 10.59 |
| 30 | email\_open | 1383 | 23.24 |
| 30 | sent\_reengagement\_email | 231 | 3.88 |
| 30 | sent\_weekly\_digest | 3706 | 62.29 |
| 31 | email\_clickthrough | 445 | 7.66 |
| 31 | email\_open | 1351 | 23.25 |
| 31 | sent\_reengagement\_email | 222 | 3.82 |
| 31 | sent\_weekly\_digest | 3793 | 65.27 |
| 32 | email\_clickthrough | 418 | 7.14 |
| 32 | email\_open | 1337 | 22.85 |
| 32 | sent\_reengagement\_email | 200 | 3.42 |
| 32 | sent\_weekly\_digest | 3897 | 66.59 |
| 33 | email\_clickthrough | 490 | 7.91 |
| 33 | email\_open | 1432 | 23.1 |
| 33 | sent\_reengagement\_email | 264 | 4.26 |
| 33 | sent\_weekly\_digest | 4012 | 64.73 |
| 34 | email\_clickthrough | 490 | 7.67 |
| 34 | email\_open | 1528 | 23.91 |
| 34 | sent\_reengagement\_email | 261 | 4.08 |
| 34 | sent\_weekly\_digest | 4111 | 64.33 |
| 35 | email\_clickthrough | 38 | 29.92 |
| 35 | email\_open | 41 | 32.28 |
| 35 | sent\_reengagement\_email | 48 | 37.8 |

**Results:**

Through this project I learned how Operation Analytics and Investigating Metric Spike help company to predict the future of the process.