Operation Analytics and Investigating Metric Spike

Project Description –

Operation Analytics is the analysis done for the complete end to end operations of a company. With the help of this, the company then finds the areas on which it must improve upon.
This kind of analysis is further used to predict the overall growth or decline of a company's fortune. It means better automation, better understanding between cross-functional teams, and more effective workflows.
This project focuses on the engagement of the users and their actions and events which is analysed with the help of the data collected.

Approach –

The ops team, support team, marketing team has decided to analyse the data collected for which the following is necessary:

1. Number of jobs reviewed
2. Throughput
3. User engagement
4. Use growth
5. Weekly retention and engagement
6. Email engagement

For finding all these details, I have used Structured Query Language (SQL) which helps in manipulating and extracting data/information.

Tech-Stack used –

I have used **MySQL Workbench Version 8.0.30** and **MS Excel** (for charts) for this project. MySQL Workbench is a great multipurpose GUI tool for MySQL which facilitates creating, designing and building databases. It also makes it easy to visualize the results of the queries and to import and export data into other software packages.

Insights –

I have derived the following information/insights using MySQL:

A. Case Study 1 (Job Data) –

1. Number of jobs reviewed:
   The number of jobs reviewed per hour per day for November 2020 is found out to get to know about those jobs.

ds	throughput
2020-11-30	144.00
2020-11-29	180.00
2020-11-28	218.18
2020-11-27	34.62
2020-11-25	80.00

If the job reviews are positive then it means better growth of the company.
The maximum number of jobs were reviewed on 30th November,2020.

2. Throughput:

ds	throughput_7d
2020-11-25	0.02
2020-11-27	0.01
2020-11-28	0.02
2020-11-29	0.02
2020-11-30	0.03

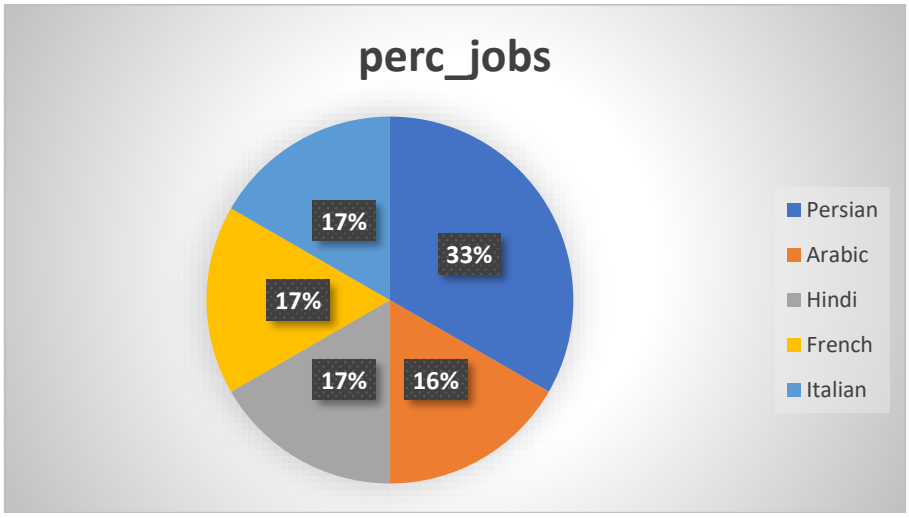
The number of events happening per second is given as throughput_7d.
I would prefer calculating the throughput on a daily basis rather than 7 days rolling average, because daily metrics will provide us more accurate information and results.

3. Percentage share of each language:

language	perc_jobs
Persian	33.33
Arabic	16.67
Hindi	16.67
French	16.67
Italian	16.67

Share of each language for different contents in the last 30 last is given in the table.

From the graph we can see that the most opted language is Persian(33%).



4. Duplicate rows:

There are 2 duplicate rows in this data set. They are:

ds	job_id	actor_id	event	language	time_spent	org
2020-11-30	22	1006	transfer	Arabic	25	B
2020-11-28	25	1002	decision	Hindi	11	B

B. Case Study 2 (Investigating Metric Spike) –

1. User Engagement:

weeks	weekly_active_users
17	663
18	1068
19	1113
20	1154
21	1121
22	1186
23	1232
24	1275
25	1264
26	1302
27	1372
28	1365
29	1376
30	1467
31	1299
32	1225
33	1225
34	1204
35	104

We need to ensure whether a user finds quality in a product / service which helps in growth of the company.

For this activeness of a user is measured by calculating the weekly user engagement given in the table.

From this table we can see that maximum users were active in the 30th week and then the number of users started decreasing gradually.

The least number of users who were active was in the last week, that is, 35th week.

2. User Growth:

day	all_users	activated_users
0	197	106
1	300	156
2	299	157
3	325	149
4	322	160
5	341	181
6	344	173
7	353	167
8	350	163
9	353	176
10	377	186
11	382	161
12	391	181
13	396	206
14	411	197
15	395	207
16	465	225
17	450	219
18	460	207
19	467	242
20	477	215

For growth of a company, growth of users is an important factor.

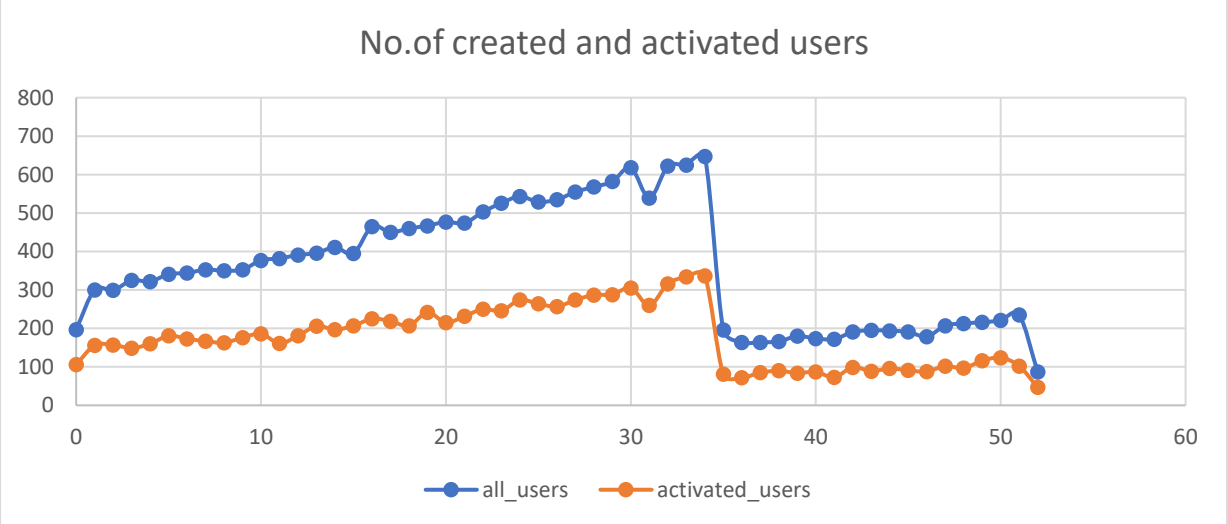
For this we need to find the number of users growing over time for a product that they use.

The number of users those who have created their account and activated it is present in the table given on daily basis.

21	474	232
22	503	250
23	526	246
24	543	274
25	529	264
26	535	257
27	555	274
28	568	287
29	582	288
30	618	305
31	539	260
32	622	316
33	625	334
34	647	337
35	196	81
36	164	72
37	164	85
38	166	90
39	180	84
40	174	87
41	172	73
42	191	99
43	195	89
44	194	96
45	191	91
46	179	88
47	207	102
48	213	97
49	216	116
50	221	124
51	235	102
52	87	47

Only few users activate their accounts after they created it, on the same day.

In order to increase the number of activated users, we need to ensure that they receive better quality product and service from the company's side.



3. Weekly retention:

The number of users getting retained weekly after signing up for a product is given in the cohort table below.

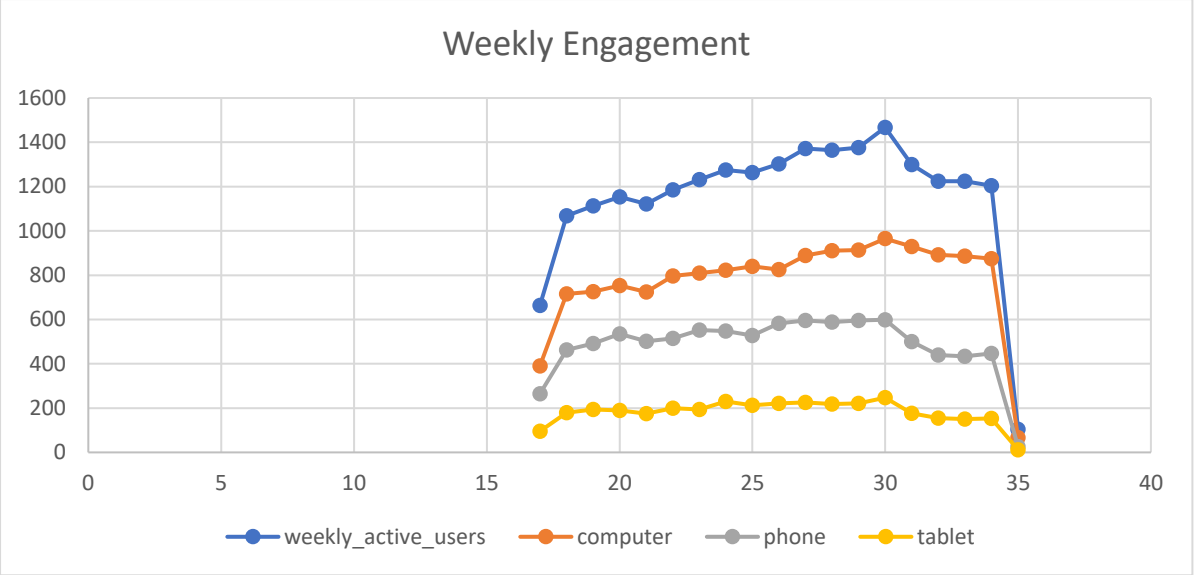
week	Average age during week	10+ weeks	9 weeks	8 weeks	7 weeks	6 weeks	5 weeks	4 weeks	3 weeks	2 weeks	1 weeks	Less than a week
17	0	663	0	0	0	0	0	0	0	0	0	0
18	0.2931	1068	0	0	0	0	0	0	0	0	0	0
19	1.0909	1113	0	0	0	0	0	0	0	0	0	0
20	2.4813	1154	0	0	0	0	0	0	0	0	0	0
21	4.0604	1121	0	0	0	0	0	0	0	0	0	0
22	0.1472	1186	0	0	0	0	0	0	0	0	0	0
23	0.9089	1232	0	0	0	0	0	0	0	0	0	0
24	2.1262	1275	0	0	0	0	0	0	0	0	0	0
25	3.5966	1064	157	0	0	0	0	0	0	0	0	0
26	1.2455	940	174	156	0	0	0	0	0	0	0	0
27	0.8229	918	99	171	165	0	0	0	0	0	0	0
28	1.8943	846	68	98	173	171	0	0	0	0	0	0
29	3.4327	800	44	73	96	180	175	0	0	0	0	0
30	3.8043	824	33	55	79	99	193	179	0	0	0	0
31	0.3635	691	26	42	50	58	95	179	155	0	0	0
32	1.2074	573	27	34	36	39	65	87	169	194	0	0
33	1.9205	532	17	33	22	19	50	60	81	210	200	0
34	2.7585	476	17	21	20	24	30	44	54	106	215	196
35	0.7778	22	0	0	0	1	3	1	1	10	6	60

4. Weekly engagement:

week	weekly_active_users	computer	phone	tablet
17	663	391	264	96
18	1068	716	463	179
19	1113	726	492	194
20	1154	753	535	189
21	1121	724	502	175
22	1186	796	515	200
23	1232	810	552	194
24	1275	822	548	230
25	1264	840	528	213
26	1302	826	582	221
27	1372	889	596	225
28	1365	910	589	218
29	1376	914	596	221
30	1467	965	599	247
31	1299	930	500	177
32	1225	892	439	155
33	1225	886	433	150
34	1204	874	447	153
35	104	66	26	12

The weekly engagement of the users using each device is given in the table.

Most of the users use computer more than phone and tablet.



5. Email engagement:

The email engagement metrics of users is given below.

week	weekly_emails	reengagement_emails	email_opens	email_clickthroughs
18	2602	157	912	430
19	2665	173	972	477
20	2733	191	1004	507
21	2822	164	1014	443
22	2911	192	987	488
23	3003	197	1075	538
24	3105	226	1155	554
25	3207	196	1096	530
26	3302	219	1165	556
27	3399	213	1228	621
28	3499	213	1250	599
29	3592	213	1219	590
30	3706	231	1383	630
31	3793	222	1351	445
32	3897	200	1337	418
33	4012	264	1432	490
34	4111	261	1528	490
17	908	73	310	166
35	0	48	41	38

Result –

Operation analytics and investigating metric spike is very helpful in promoting and enhancing the growth / quality of a particular product / service based the activities of the users.

This project has helped me learn how to analyse a given data based on various purposes. I could understand the behaviour and patterns of users which basically decides the success/downfall and usage of the product.