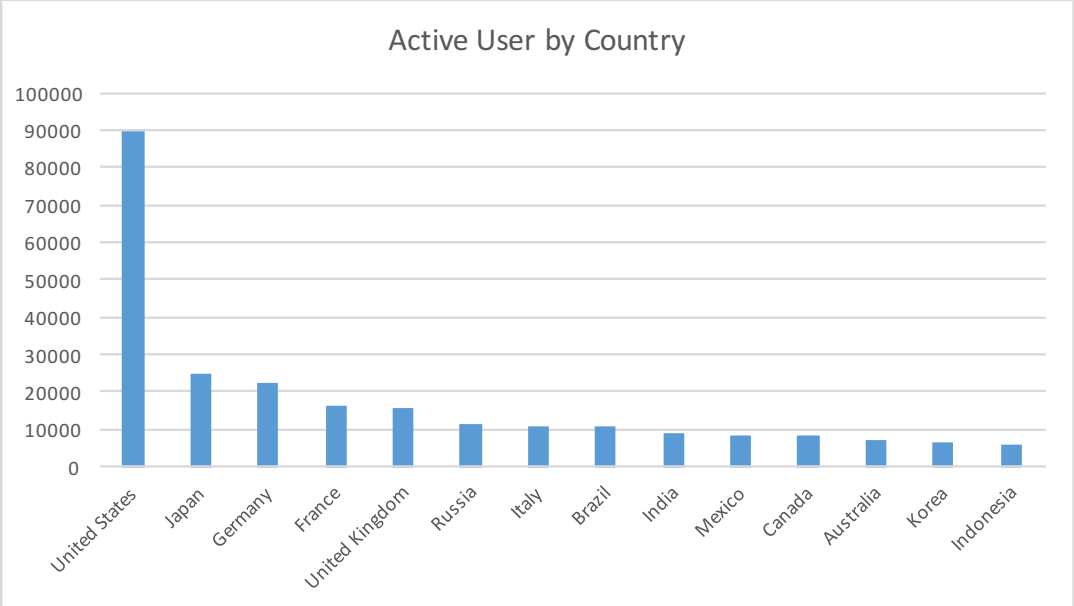
Mode Analytics: "Drop in User Engagement at Yammer"

Problem:
As an analyst at Yammer, the head of product team required my opinions and analysis on the recent trend of user engagement. Yammer defines engagement as having made some type of server call by interacting with the product (shown in the data as events of type "engagement"). User engagement will be the number of users who logged at least one engagement event during the week starting on that date.

You are responsible for determining what caused the dip at the end of the chart shown above and, if appropriate, recommending solutions for the problem.

Hypothesis 1: The dip occurred because of holiday in different countries

Code:
```
select events.location, count(users.user_id)
from tutorial.yammer_events events
join tutorial.yammer_users users
on events.user_id = users.user_id
where state = 'active' and event_type = 'engagement'
group by location
order by count(users.user_id) desc;
```



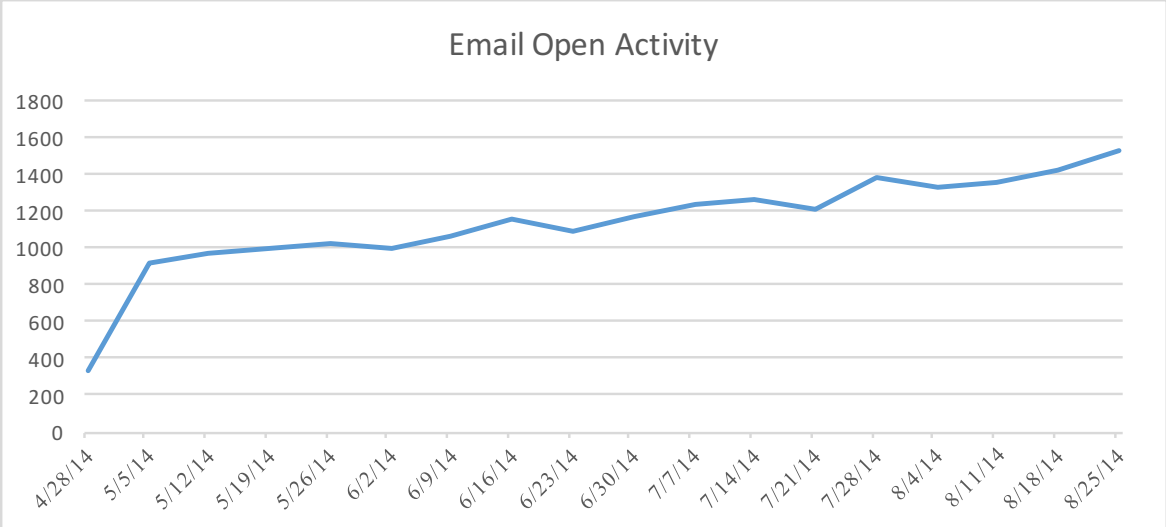
The rationale was to study if the holiday period in other countries beside the US would have caused the dip in user engagement. With the result above, even there was a holiday in other countries during August, it would not impact much because most of the active users are in the US.

I was interested to look into more detail for any dips in user activities that might have caused the issue. Therefore, I wrote to inquiry what the email open activity performed during this

period. The activity seemed operating normal during this time. Thus, the hypothesis 1 was not related to the cause of the dip in user engagement.

Code:

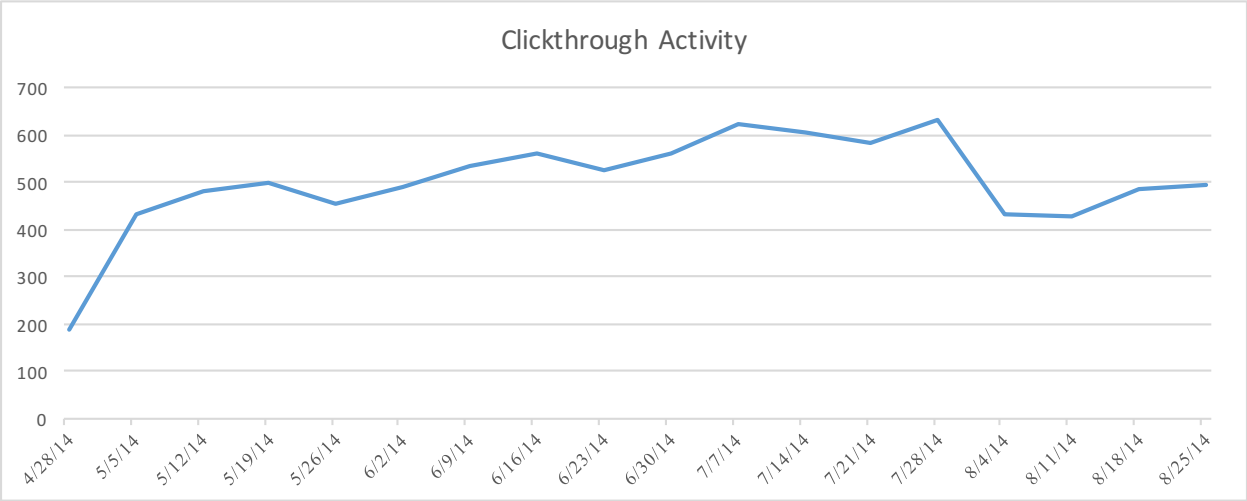
```
select  date_trunc('week', occurred_at) as week_date, count(user_id) as user_actions
from tutorial.yammer_emails  emails
where  action  = 'email_open'
group by date_trunc('week', occurred_at)
order by date_trunc('week', occurred_at) asc;
```



Hypothesis 2: The chance of having system failure

Code:

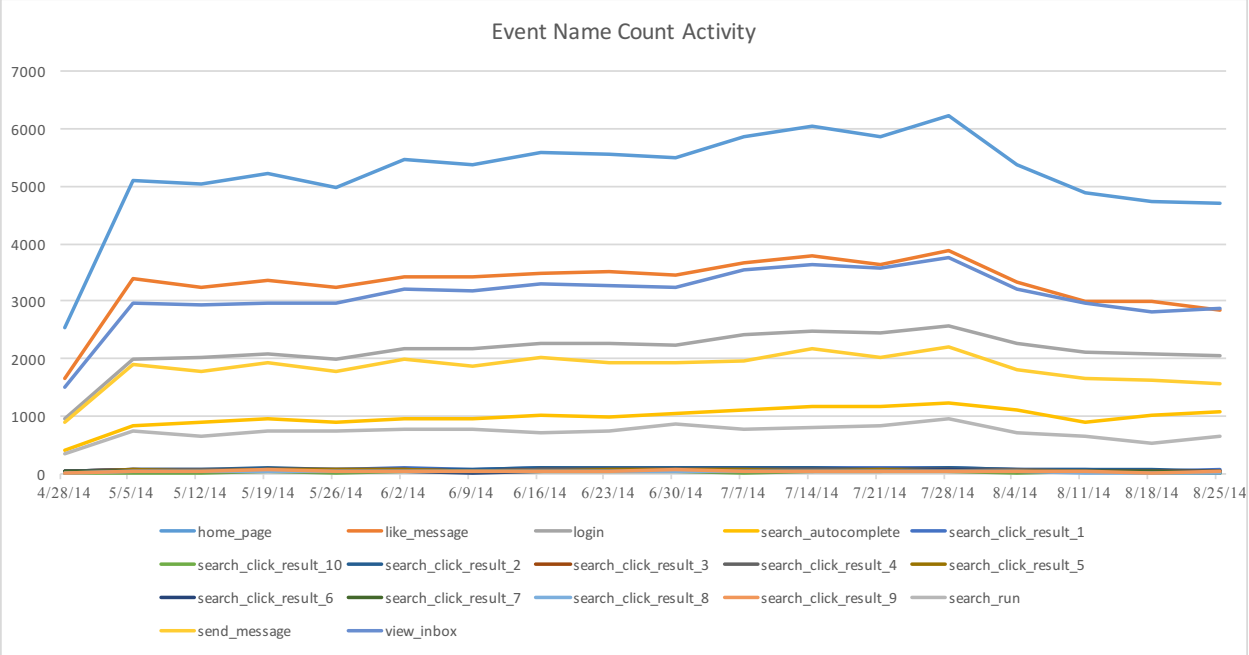
```
select date_trunc('week', occurred_at) as week_date, action, count(user_id) as count_actions
from tutorial.yammer_emails emails
where action = 'email_clickthrough'
group by date_trunc('week', occurred_at), action
order by date_trunc('week', occurred_at) asc;
```



With hypothesis 2, I aimed to look more detail into the activity of the users and the website page count to see if there was any decrease in them. It turned out the clickthrough and homepage had decreased dramatically from August. Consequently, the dip in user engagement must have some relations with this clickthrough and homepage.

Code:

```
select   date_trunc('week', occurred_at) as week_date, event_name,count(user_id)
from     tutorial.yammer_events events
where  event_type = 'engagement'
group by DATE_TRUNC('week', occurred_at), event_name
order by DATE_TRUNC('week', occurred_at) asc;
```



Answer the following questions:

1. Do the answers to any of your original hypotheses lead you to further questions? If so, what are they and how will you test them?

Yes, the hypothesis even didn't give out the real answer to the problem, it was still useful to eliminate some of the chances and narrowed down to the real answer like we delved deeper into user activities which eventually gave out some clues.

2. If they are questions that you can't answer using data alone, how would you go about answering them (hypothetically, assuming you actually worked at this company)?

Normally, the head of the products could go to his team and requested for any testing necessary to find the actual answer on the homepage site.

3. What seems like the most likely cause of the engagement dip?

The likely cause might coming from the homepage site where users have the most interactions with. The users could find something on the page less interesting to come back on it again.

4. What, if anything, should the company do in response?

The company could ask the product team to design a new homepage and then had an A/B testing on a new website page to test out users responses.