

## ■ 1 - Introduction

```
/* The chart displays Yammer's weekly engagement.
 * You can see the dip in engagement during the final week of July and first week of
August 2014.
 * The goal of the rest of this report to formulate potential ideas for why this dip
occurred.
 *
 * See this for a description of the challenge:
https://community.modeanalytics.com/sql/tutorial/a-drop-in-user-engagement/.
 */
```

```
SELECT
DATE_TRUNC('week', e.occurred_at) as week,
    COUNT(DISTINCT e.user_id) AS weekly_active_users
FROM tutorial.yammer_events e
WHERE e.event_type = 'engagement'
    AND e.event_name = 'login'
GROUP BY 1
ORDER BY 1;
```

## ■ 2 - Country Check, Large

```
/* My first hypothesis was that a seasonal change or holiday lead the decrease in usage.
 * So I tested to see whether the decrease was uniquely situated in a certain country(s)
or regions.
 * 'Change in Use per Week by Country' shows the change in use over the weeks
surrounding the dip by country.
 * My next query '3 Country Check - Small' checks the two specific weeks in which the
dip occurred.
 * Results: No meaningful regional account for the dip was found.
 */
```

```
SELECT
location,
DATE_TRUNC('week', e.occurred_at) AS week,
COUNT(DISTINCT e.user_id) AS weekly_active_users,
COUNT(DISTINCT e.user_id) - lag(COUNT(DISTINCT e.user_id)) OVER (PARTITION BY
location ORDER BY DATE_TRUNC('week', e.occurred_at), location) AS difference,
(COUNT(DISTINCT e.user_id) - lag(COUNT(DISTINCT e.user_id)) OVER (PARTITION BY
location ORDER BY DATE_TRUNC('week', e.occurred_at), location)) * 100 /
COUNT(DISTINCT e.user_id) AS percent_change
FROM tutorial.yammer_occurred_events e
```

```

WHERE e.event_type = 'engagement'
AND e.event_name = 'login'
AND e.occurred_at >= '2014-07-14'
AND e.occurred_at <= '2014-08-17';

```

### ■ 3 - Country Check, Small

```

/* To better see the change by country during the dip itself,
* this query just focuses on the two weeks in which the dip occurred.
* 'Percent Change by Country' shows the percent change per country.
* Results: No meaningful regional or country-based account for the dip was
found.
*/

```

```

SELECT
location,
DATE_TRUNC('week', e.occurred_at) AS week,
COUNT(DISTINCT e.user_id) AS weekly_active_users,
COUNT(DISTINCT e.user_id) - lag(COUNT(DISTINCT e.user_id)) OVER (PARTITION
BY location ORDER BY DATE_TRUNC('week', e.occurred_at), location) AS
difference,
(COUNT(DISTINCT e.user_id) - lag(COUNT(DISTINCT e.user_id)) OVER (PARTITION
BY location ORDER BY DATE_TRUNC('week', e.occurred_at), location)) * 100 /
COUNT(DISTINCT e.user_id) AS percent_change
FROM tutorial.yammer_events e
WHERE e.event_type = 'engagement'
AND e.event_name = 'login'
AND e.occurred_at >= '2014-07-28'
AND e.occurred_at <= '2014-08-10'

GROUP BY 1, 2;

```

### ■ 4 - Action Type Check

```

* The graph charts change of use by event type (the variable event_name).
* Results: All types decrease, but login, like_message, and home_page seem to
decrease the most. This will be important later.
*/

```

```

SELECT
event_name,
DATE_TRUNC('week', e.occurred_at) as week,
COUNT(DISTINCT e.user_id) AS weekly_active_users
FROM tutorial.yammer_events e

```

```
WHERE e.event_type = 'engagement'
GROUP BY 1, 2
ORDER BY 1, 2;
```

## ■ 5 - Length of Account Check

/\* My third hypothesis was that there was a difference in use based on how long a user had an account,

- \* either new users were not using the account or older users were dropping there usage.

- \* To test this, I used the created\_at variable stored in the yammer\_users emails.

- \* I split users into terms based on when they created the account and counted each group's activity throughout the weeks.

- \* The terms were based on the year and the quarter of that year in which they created their accounts.

- \* Results:

- \* A very significant decrease by users who created their account in Quarter 2 2014 (April - June).

- \* They start as the highest users by far and decreased throughout the period.

- \* There is also a high volume of and steady increase in usage by Quarter 3 2014 (July-Sept) throughout the period.

- \* Users before Quarter 2 2014 did not see a noticeable change in use and have significantly lower rates.

- \* Conclusion:

- \* This makes sense as new users would use the account more often given its novelty, which wears off overtime.

- \* Quarter 2 users who had the account for less than a few months account for most of the uses at first,

- \* only to be usurped by, Quarter 3 users who had created the accounts during the period in question.

- \* Accounting for the steep decrease in Quarter 2 uses seems significant.

- \* Intermediately old users who had had their account for 2-6 months account for most of the dip.

\*/

```
SELECT
```

```
CASE
```

```
WHEN u.created_at >= '2013-01-01' AND u.created_at < '2013-04-01' then 'Quarter 1 2013'
```

```
WHEN u.created_at >= '2013-04-01' AND u.created_at < '2013-07-01' then 'Quarter 2 2013'
```

```
WHEN u.created_at >= '2013-07-01' AND u.created_at < '2013-10-01' then 'Quarter 3 2013'
```

```

WHEN u.created_at >= '2013-10-01' AND u.created_at < '2014-01-01' then 'Quarter 4
2013'
WHEN u.created_at >= '2014-01-01' AND u.created_at < '2014-04-01' then 'Quarter 1
2014'
WHEN u.created_at >= '2014-04-01' AND u.created_at < '2014-07-01' then 'Quarter 2
2014'
WHEN u.created_at >= '2014-07-01' AND u.created_at < '2014-10-01' then 'Quarter 3
2014'
WHEN u.created_at >= '2014-10-01' AND u.created_at < '2015-01-01' then 'Quarter 4
2014'
END AS term,
DATE_TRUNC('week', e.occurred_at) as week,
    COUNT(DISTINCT e.user_id) AS weekly_active_users
FROM tutorial.yammer_users u
JOIN tutorial.yammer_events e
ON u.user_id = e.user_id
WHERE e.event_type = 'engagement'
AND e.event_name = 'login'
GROUP BY 1, 2
ORDER BY 1, 2;

```

## ■ 6 - Account Sign-Ups Overtime

/\* Based on the 5th query, I was wondering whether there was a change in the amount of new users overtime.

\* If the dip was potentially related to a decrease in users who had an account for 2-6 months,

\* then was there a decrease in the number of new users joining the site 2-6 months before the dip?

\* This query counts the number of newly created accounts by annual quarters to determine any change.

\* The chart displays these counts.

\* Results: There have been a steady increase in the number of new users each quarter.

\* In Quarter 2 2014 (2-6 months before the dip in question), there is a disproportionate increase in number of new users, the opposite of what is expected.

\* Quarter 3 2014 (when the dip occurred) has more new users than Quarter 1 2014 and before, confirming the steady increase,

\* but less than the huge increase of Quarter 2 2014 (by about 600).

\* Conclusion:

\* Quarter 2 2014 had a disproportionate increase in new users. Quarter 3 2014, although expanding at a more typical rate, could not compete.

\* As normal, Quarter 2 2014 users who decreased their overall use in July and August,

\* a few months after creating their account (demonstrated by the chart in the 5th query), maybe as the novelty wore off,

\* but since fewer new users took their place, this led to a dip.  
\*/

```
SELECT
CASE
WHEN u.created_at >= '2013-01-01' AND u.created_at < '2013-04-01' then '2013
Quarter 1'
WHEN u.created_at >= '2013-04-01' AND u.created_at < '2013-07-01' then '2013
Quarter 2'
WHEN u.created_at >= '2013-07-01' AND u.created_at < '2013-10-01' then '2013
Quarter 3'
WHEN u.created_at >= '2013-10-01' AND u.created_at < '2014-01-01' then '2013
Quarter 4'
WHEN u.created_at >= '2014-01-01' AND u.created_at < '2014-04-01' then '2014
Quarter 1'
WHEN u.created_at >= '2014-04-01' AND u.created_at < '2014-07-01' then '2014
Quarter 2'
WHEN u.created_at >= '2014-07-01' AND u.created_at < '2014-10-01' then '2014
Quarter 3'
WHEN u.created_at >= '2014-10-01' AND u.created_at < '2015-01-01' then '2014
Quarter 4'
END AS term,
COUNT(distinct user_id) as quarterly_new_users
FROM tutorial.yammer_users u
GROUP BY 1;
```

#### ■ 7 - 2014 Quarter 2 and Quarter 3 Sign-Ups

/\* Based on the 5th and 6th query, I decided to look at the number of new users by week during quarter 2 and 3.  
\* Results: The number of new users has been steadily increasing during this period.  
\* There is a sharp decrease in sign-ups during the dip.  
\* There were slightly smaller dips in the end of April, mid-May, and mid-June.  
\* Conclusion:  
\* The little dips might partially explain the dip between July and August,  
\* but the decrease in new users during the engagement dip may also indicate a software malfunction (like the 4th query indicates).  
\*/

```
SELECT
DATE_TRUNC('week', u.created_at) as week,
COUNT(DISTINCT u.user_id) as weekly_new_users
FROM tutorial.yammer_users u
WHERE created_at >= '2014-04-01' AND u.created_at < '2014-10-01'
```

GROUP BY 1  
ORDER BY 1;

## ■ 8 - Device Usage Check

```
/* Going back to the finding from Query 4 that the dip disproportionately involved
certain types of actions,
* this query looks into whether certain devices saw steeper engagement dips.
* If a certain device received a significant dip, unlike other devices, this is potentially
due to either that device malfunctioning
* and/or a recent user interface issue using that device.
* Results: Although all devices decrease during the dip, phones have a particularly steep
dip, and the tablets have a noticeable dip too.
* Conclusion: It is worth checking whether there is an issue with the phone and
secondarily with the tablets.
*/
```

```
SELECT
CASE
WHEN device in ('macbook pro','lenovo thinkpad','macbook air','dell inspiron notebook',
               'asus chromebook','dell inspiron desktop','acer aspire notebook','hp pavilion
desktop','acer aspire desktop','mac mini') THEN 'computer'
WHEN device in ('iphone 5','samsung galaxy s4','nexus 5','iphone 5s','iphone 4s','nokia
lumia 635',
               'htc one','samsung galaxy note','amazon fire phone') THEN 'phone'
WHEN device in ('ipad air','nexus 7','ipad mini','nexus 10','kindle fire','windows surface',
               'samsung galaxy tablet') THEN 'tablet'
ELSE NULL
END AS device_type,
DATE_TRUNC('week', occurred_at) as week,
COUNT(DISTINCT user_id) as weekly_active_users
FROM tutorial.yammer_events
GROUP BY 1, 2
ORDER BY 1, 2;
```

## ■ 9 - Email Actions Check

```
/* Finally, we will check through different types of email usage to determine
* whether there is a significant difference in email uses over the weeks.
* Results: There is a significant dip in the email_clickthroughs.
* Conclusion: Check for a malfunction or user issue in the email_clickthroughs.
*/
```

```
SELECT action,  
DATE_TRUNC('week', em.occurred_at) as week,  
COUNT(DISTINCT em.user_id) AS weekly_active_users  
from tutorial.yammer_emails em  
group by 1, 2  
order by 1, 2;
```

## ■ 10 – Conclusion

### Conclusion of Findings and Potential Issues to Explore:

#### 1. Dip in new users

A disproportionate increase in the number of new users 2-6 months before the dip, in addition to a lower amount of new users during the quarter of the dip, may explain some of the part of the dip. Given that new users from the last few months make up for most of the engagement activity, this would have significant influence on engagement. For this, I would see how to make Yammer appealing to new users and companies.

#### 2. Check for bugs in the email system

Check for a malfunction or user issue in the email system, particularly the email click trough's, which saw a significant decrease.

#### 3. Check bugs for phone and tablet device connections

Check for a malfunction or user issue in the phone or tablet systems. There was a significant decrease in phone use during this period, and also a potentially significant decrease in tablet use.