Mike_Munsell_Yammer

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0.0.1 Yammer Data Challenge

Mike Munsell February 27, 2019

Summary of findings The most engagements for Yammer are in countries that experience an "August shutdown" - where workers go on vacation before the school year starts (e.g., United States and the Western Europe). Therefore, the drop we are seeing in engagements in August is most likely due to users being out of the office. The largest drop in engagements is in Mobile devices (mobile phones and tablets) [Figure 1], particiularly viewing your inbox and sending messages [Figure 2]. This makes sense as users keep their work computers on with "out of the office messages" engaged, but do not send emails on their phone, which is most likely with them on vacation.

Recommendation Viewing of messages on Mobile devices, the largest driver of the decrease in engagement [Figure 2] has started to increase in the last week of August, so it is best to wait and view the trends for early September before we make any changes.

In [15]:
```
#Import data and necessary libraries
import pandas as pd
import numpy as np
import datetime
import os
import seaborn as sns
sns.set(style="whitegrid")
import matplotlib.pyplot as plt
%matplotlib inline

#Import events data
working_dir = os.getcwd()
events_data = pd.read_csv(os.path.join(working_dir,"data/challenge_2/yammer_events.csv"
events_data['day_date'] = pd.to_datetime(events_data['occurred_at'].astype(str).str[0:1
#Print top 5 countries with engagement
print("August is a popular vacation time for many of our top 5 countries")
print(" ")
events_data[events_data.event_type == 'engagement'].groupby(by='location').agg('count')
```

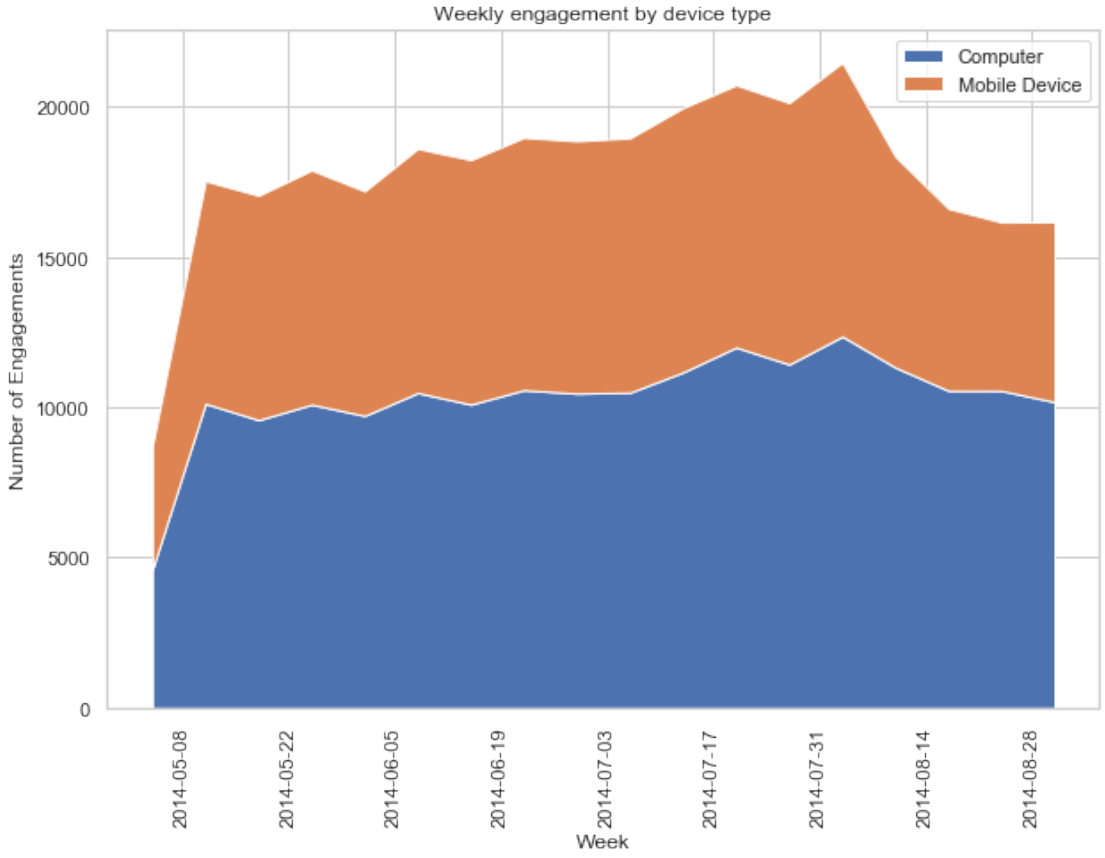
```
August is a popular vacation time for many of our top 5 countries
```

Out[15]:
```
location
United States     89379
Japan             24584
Germany           22304
France            16469
United Kingdom    15590
Name: user_id, dtype: int64
```

In [18]:
```
#Create Dataframe grouped by device type and date
plot_device = events_data[events_data.event_type == 'engagement'].groupby(by=['device',
                                                    'day_date']).agg('count').reset_ind

#Create variable for Mobile
plot_device['Mobile'] = np.where((plot_device.device == 'amazon fire phone') |\
        (plot_device.device == 'htc one') |\
         (plot_device.device == 'iphone 4s') |\
         (plot_device.device == 'iphone 5') |\
         (plot_device.device == 'iphone 5s') |\
         (plot_device.device == 'samsung galaxy note') |\
         (plot_device.device == 'samsung galaxy s4') |\
         (plot_device.device == 'nokia lumia 635') |\
         (plot_device.device == 'ipad mini') |\
         (plot_device.device == 'ipad air') |\
         (plot_device.device == 'kindle fire') |\
         (plot_device.device == 'nexus 10') |\
         (plot_device.device == 'nexus 5') |\
         (plot_device.device == 'nexus 7') |\
         (plot_device.device == 'samsumg galaxy tablet') |\
         (plot_device.device == 'windows surface'), 1, 0)

#Reample everything as weekly total
def weekly_sum(df):
    return(df.resample('W').sum())

#Create v-stack for plotting
device_plotdata = np.vstack((weekly_sum(plot_device[plot_device.Mobile == 0].set_index(
                             weekly_sum(plot_device[plot_device.Mobile == 1].set_index(

print("The largest drop in weekly engagement is on Mobile devices, with desktop compute

fig, ax = plt.subplots(figsize=(10,7))
ax.stackplot(plot_device.set_index('day_date').resample('W').sum().index, \
             device_plotdata, labels=['Computer', 'Mobile Device'])
ax.set_ylabel('Number of Engagements')
ax.set_xlabel('Week')
plt.xticks(rotation='vertical')
plt.title('Weekly engagement by device type')
plt.legend(loc='best')
```

```
plt.show()
```

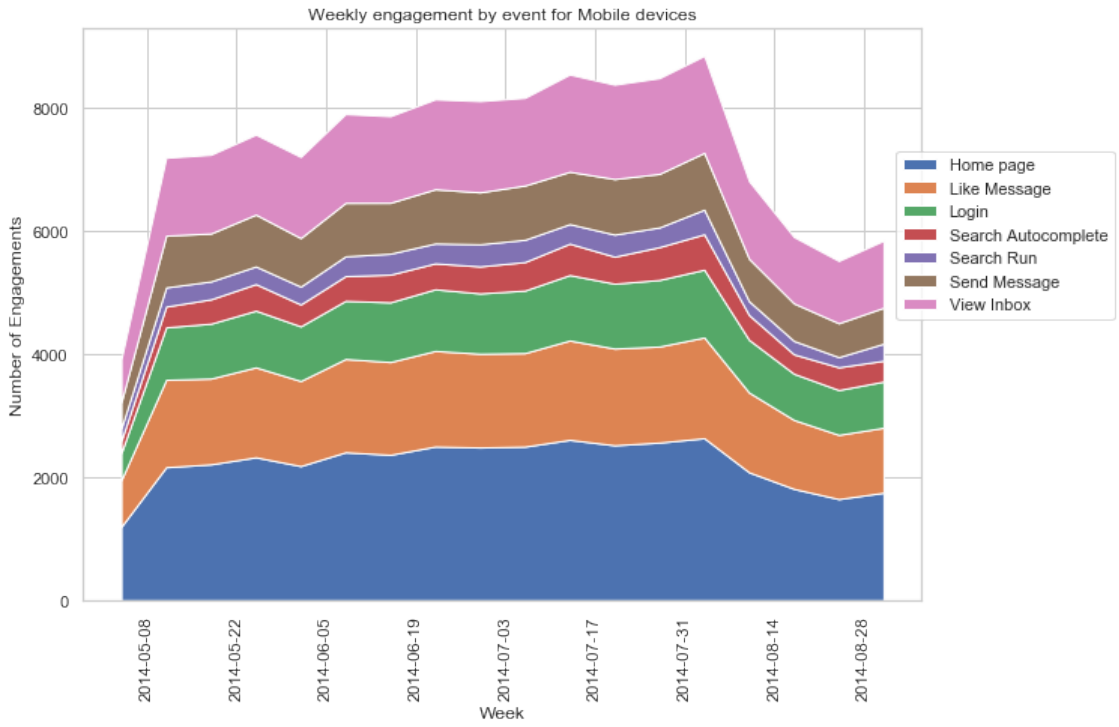
The largest drop in weekly engagement is on Mobile devices, with desktop computers/laptops remai



In [20]:
```
#Create Dataframe grouped by device type, date, and event name
plot_device2 = events_data[events_data.event_type == 'engagement'].groupby(by=['device'
                                                    'event_name', 'day_date']).agg('count').res

#Create variable for Mobile
plot_device2['Mobile'] = np.where((plot_device2.device == 'amazon fire phone') |\
        (plot_device2.device == 'htc one') |\
         (plot_device2.device == 'iphone 4s') |\
         (plot_device2.device == 'iphone 5') |\
         (plot_device2.device == 'iphone 5s') |\
         (plot_device2.device == 'samsung galaxy note') |\
         (plot_device2.device == 'samsung galaxy s4') |\
         (plot_device2.device == 'nokia lumia 635') |\
         (plot_device2.device == 'ipad mini') |\
         (plot_device2.device == 'ipad air') |\
```

```
            (plot_device2.device == 'kindle fire') |\
            (plot_device2.device == 'nexus 10') |\
            (plot_device2.device == 'nexus 5') |\
            (plot_device2.device == 'nexus 7') |\
            (plot_device2.device == 'samsumg galaxy tablet') |\
            (plot_device2.device == 'windows surface'), 1, 0)

    #Evaluate type of event
    home_page = plot_device2[(plot_device2.event_name == 'home_page') & \
                             (plot_device2.Mobile == 1) ].set_index('day_date').user_id
    like_message = plot_device2[(plot_device2.event_name == 'like_message') & \
                               (plot_device2.Mobile == 1)].set_index('day_date').user_id
    login = plot_device2[(plot_device2.event_name == 'login')& \
                         (plot_device2.Mobile == 1)].set_index('day_date').user_id
    search_autocomplete = plot_device2[(plot_device2.event_name == 'search_autocomplete')&
                                       (plot_device2.Mobile == 1)].set_index('day_date').us
    search_run = plot_device2[(plot_device2.event_name == 'search_run')&\
                             (plot_device2.Mobile == 1)].set_index('day_date').user_id
    send_message = plot_device2[(plot_device2.event_name == 'send_message') &\
                               (plot_device2.Mobile == 1)].set_index('day_date').user_id
    view_inbox = plot_device2[(plot_device2.event_name == 'view_inbox') & \
                             (plot_device2.Mobile == 1)].set_index('day_date').user_id

    #Create v-stack for plotting
    device2_plotdata = np.vstack((weekly_sum(home_page), weekly_sum(like_message), \
                                  weekly_sum(login), weekly_sum(search_autocomplete) ,weekl
                                  weekly_sum(send_message), weekly_sum(view_inbox)))


    print("The largest drop in weekly engagement is viewing your inbox on a Mobile device,


    fig, ax = plt.subplots(figsize=(10,7))
    ax.stackplot(view_inbox.resample('W').sum().index, device2_plotdata, labels=['Home page
    plt.legend(loc='upper center', bbox_to_anchor=(1.1, 0.8))
    ax.set_ylabel('Number of Engagements')
    ax.set_xlabel('Week')
    plt.xticks(rotation='vertical')
    plt.title('Weekly engagement by event for Mobile devices')
    plt.show()
```

```
The largest drop in weekly engagement is viewing your inbox on a Mobile device, which has been i
```


Weekly engagement by event for Mobile devices
Number of Engagements
0
2000
4000
6000
8000
2014-05-08
2014-05-22
2014-06-05
2014-06-19
2014-07-03
2014-07-17
2014-07-31
2014-08-14
2014-08-28
Week
Home page
Like Message
Login
Search Autocomplete
Search Run
Send Message
View Inbox