

2-Step Verification

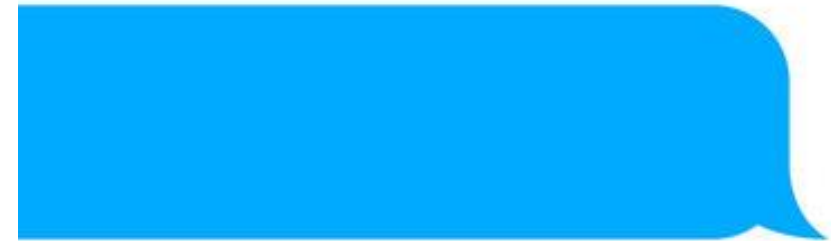
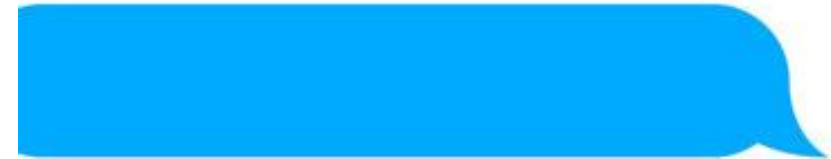
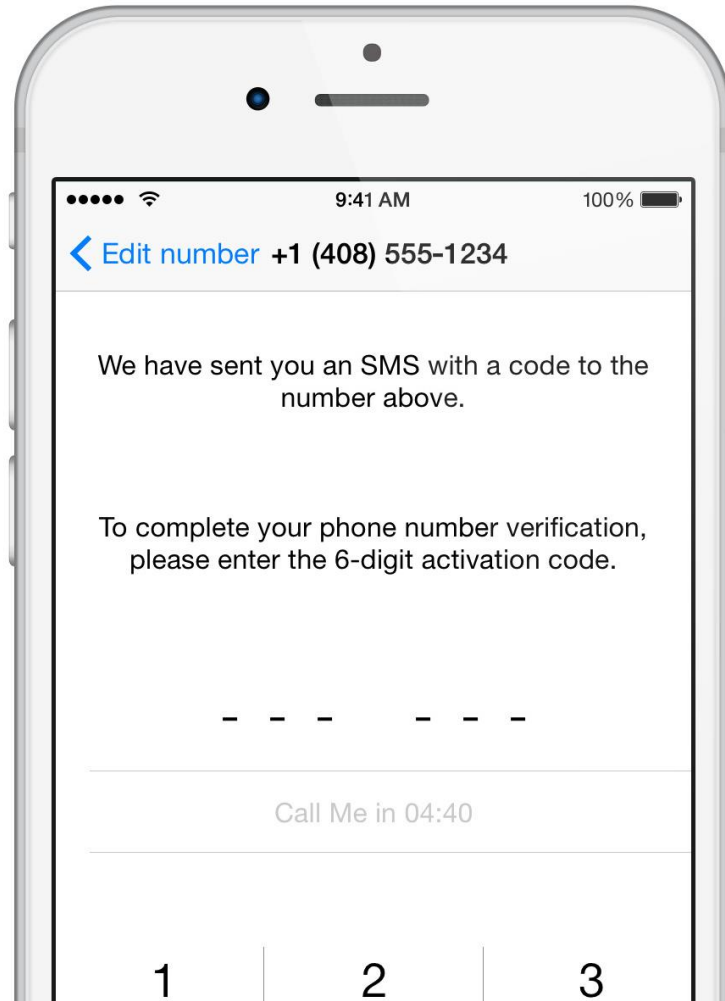
Confirm that it works

Google just sent a text message with

Enter the code

743928

Didn't get it? [Resend](#)



EPHEMERAL MESSAGING

EXPLORING PURPOSES AND IMPLICATIONS

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EPHEMERAL MESSAGING

- Ephemeral messaging is the mobile-to-mobile transmission of multimedia messages that disappear after a short period of time.
- Gaining access to any free text and email messages is rare
- The content is not like typical message content

Text
messages

1 day ago	916-919-****	Who is this
1 day ago	346-803-****	Use 762956 as your login code for Tinder. (Account Kit by Facebook)

Email
messages

From	Subject	Received
<input type="checkbox"/> noreply	MiX Automation Live Unit (CA-BING) -- Sub-trip start	moments ago
<input type="checkbox"/> Notification Processor	MiX Automation Live Unit : Sub-trip start Event	moments ago

RESEARCH QUESTIONS

- 1. What are people using these ephemeral messaging services for?
- 2. What are the implications of ephemeral messaging on security and privacy?

20 hours ago	346-803-****	Use 561250 as your login code for Roz Dhan. (Account Kit by Facebook)
20 hours ago	346-803-****	Telegram code 91306

SCRAPING DATA

- 7 scrapers to collect data from 7 websites
 - They take between 1 second and 40 minutes to run
 - Some run as many as 12 times each day

Scrape
this

```
<tr>  
<td>21 hours ago</td>  
<td><a href="https://freephonenum.com/receive-sms-from/1616794">310-808-****</a>  
</td>  
<td>Lol who is this</td>  
</tr>
```

To collect
this

49 minutes ago	646-502-****	Your Appointment is scheduled with Kaushik-TestingNewAccount on Jul 08 04:4 Sample in Kaushik-TestingNewAccount . Enjoy the service Sir/Madam.
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You've gone incognito

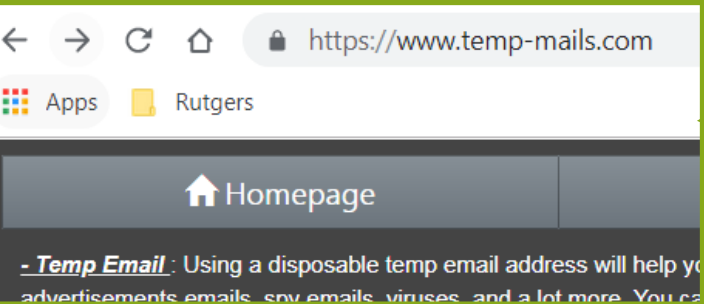
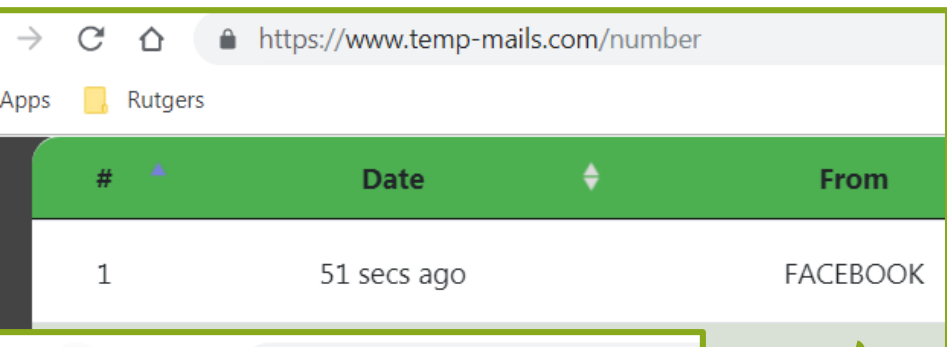
CHALLENGES IN SCRAPING DATA

- Sometimes cannot scrape useful information from HTML
- Cannot scrape all email data from one page
- Some sites do not allow you to access too much data

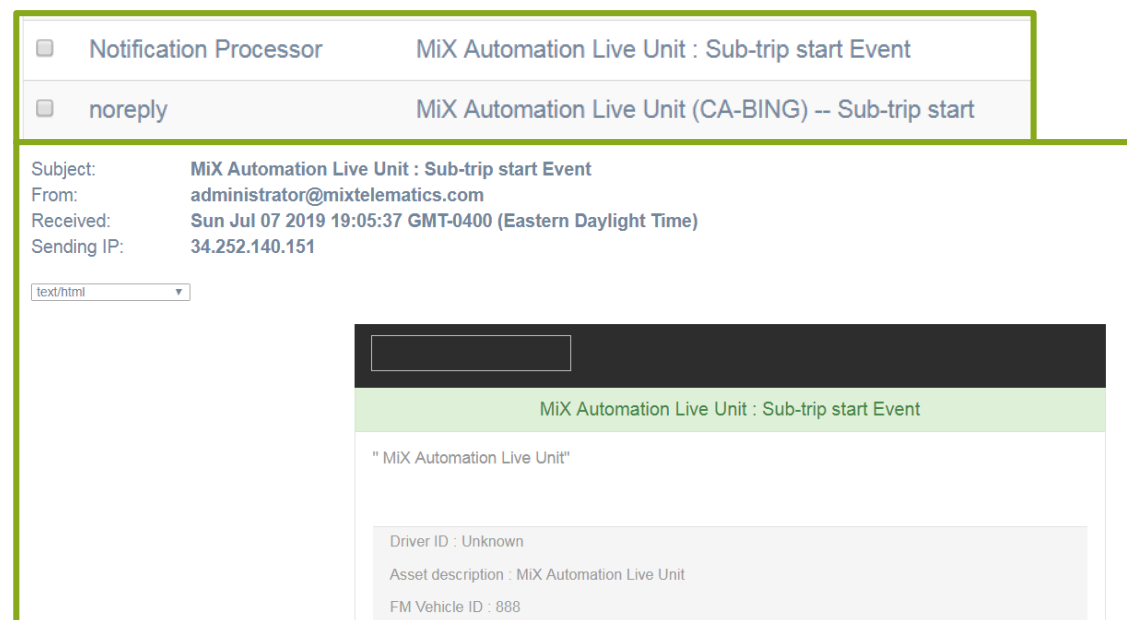
```

<tr>
  <td>
    Subject:
  </td>
  <td>
    <b>{{msg.subject}}</b>
  </td>
</tr>
<tr>
  <td>
    From:
  </td>
  <td>
    <b>{{msg.fromfull}}</b>
  </td>
</tr>
<tr>
  <td>
    Received:
  </td>
  <td>
    <b>{{msg.received}}</b>
  </td>
</tr>

```



Redirects to



ATTRIBUTES OF DATA

143,892 TEXT MESSAGES

- Receiver number
- Date
- Time range
- Sender number
- Country code of sender
- Type of phone number
- Message
- Source
- Category
- Company Subcategory
- Purpose Subcategory

12,320 EMAIL MESSAGES

- Receiver email
- Date
- Time range
- Sender name or email
- Message subject
- Message body
- Category

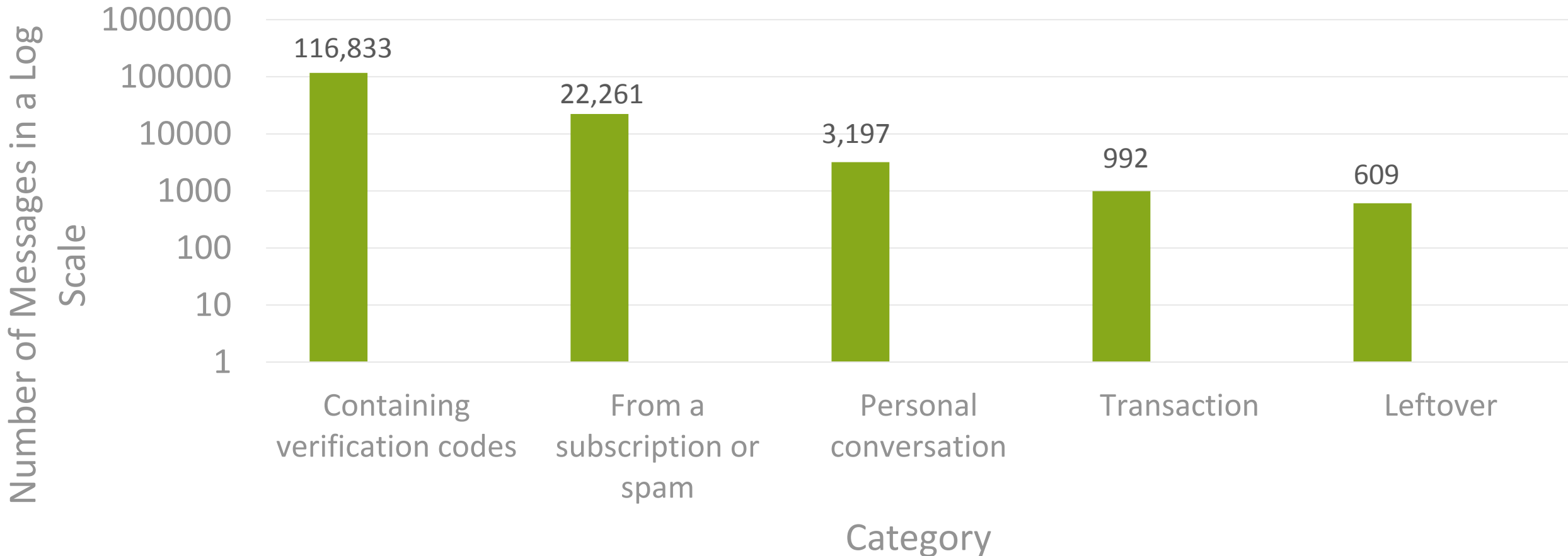
CATEGORIZING TEXT MESSAGES

- Example:

```
<#> Codul tu Tinder este 718261 d...  
REQUESTED Appointment ID: 7997321 for July 3, 2019 at 3:00 PM with Dr. Somdu
```
- Machine Learning Algorithm – 98% accuracy
 - Transform each text message into a set of features
 - Apply either 1. Gaussian Naïve Bayes or 2. k Nearest Neighbor
- Heuristic Algorithm – close to 100% accuracy
 - Find keywords and identify how accurately they predict a category
 - For each round
 - Look for certain keywords and assign categories

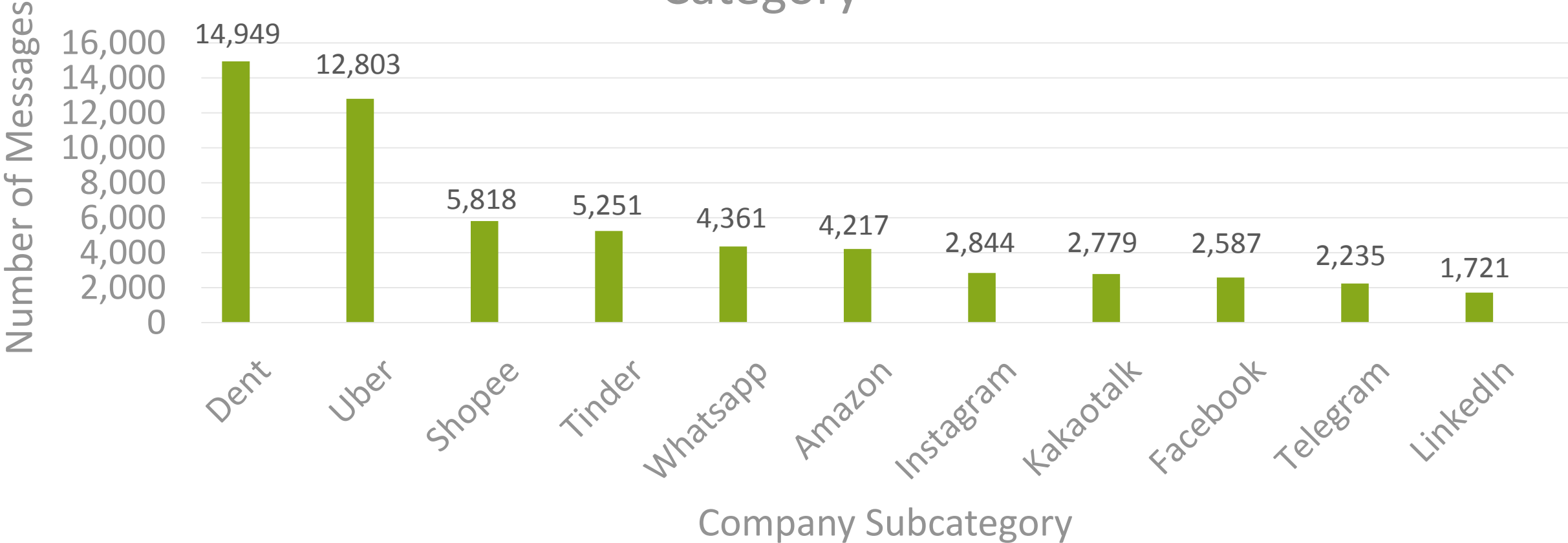
MOST MESSAGES CONTAIN VERIFICATION CODES

Category vs Number of Messages



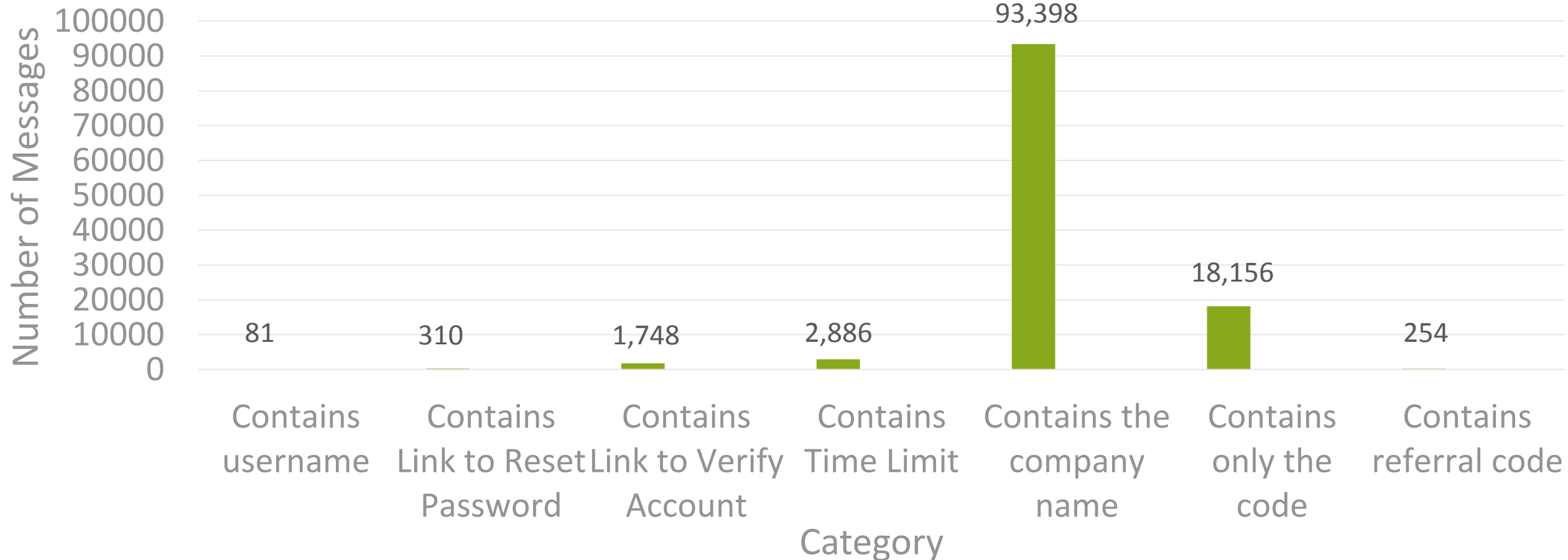
MANY PEOPLE ARE PURCHASING A DATA PLAN OR USING THESE SERVICES FOR SOCIAL MEDIA SITES

Company vs Number of Messages in the Verification Code Category



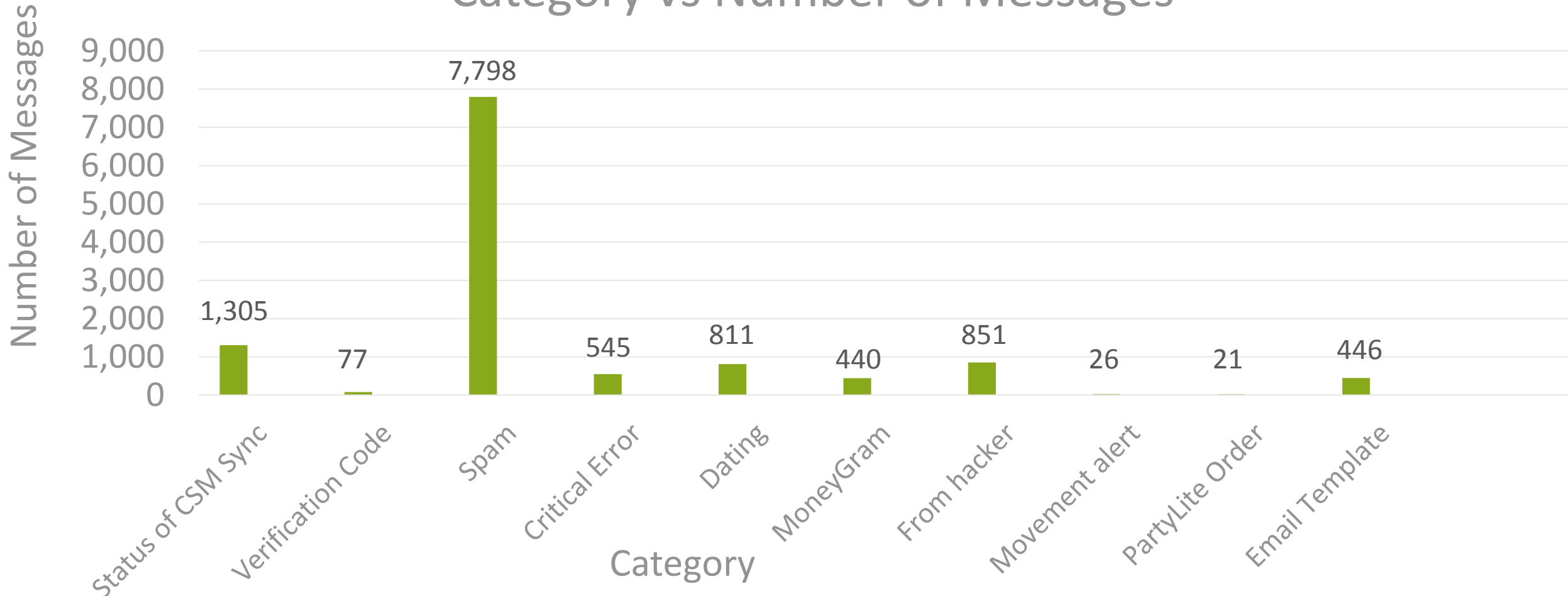
MANY CONTAIN SOME INFORMATION THAT WILL ENABLE YOU LOG INTO AN ACCOUNT

Category within Verification Codes vs Number of Messages



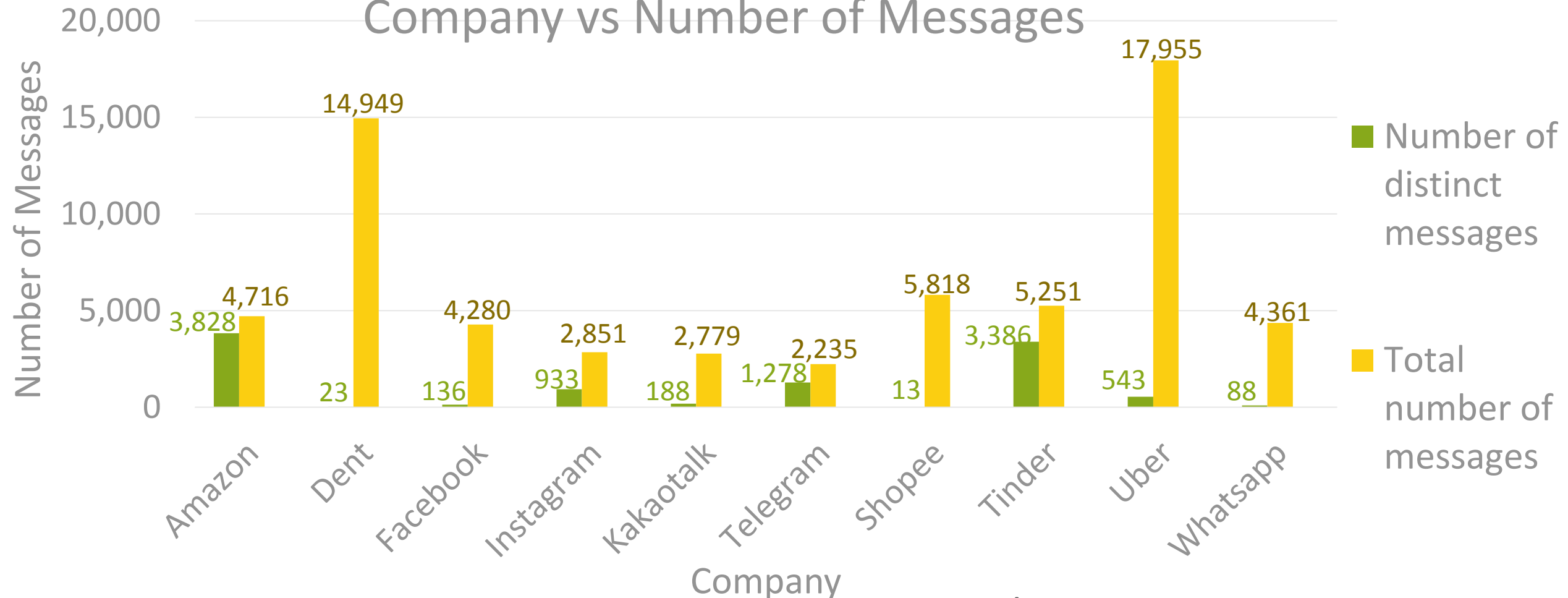
SOME COMPANIES USE EPHEMERAL EMAIL MESSAGING SERVICES FOR NON-SPAM PURPOSES

Category vs Number of Messages



POSSIBLE SECURITY ISSUE: DO SOME VERIFICATION MESSAGES REPEAT MANY TIMES?

Company vs Number of Messages



Total: 54,445 distinct text messages / 143,892 total text messages

SECURITY ISSUE: COMPANIES REUSE VERIFICATION CODES

Message	Number of Times That It Appears	Number of Days That It Appears
Your DENT code is: 0834**	900	15
Your DENT code is: 1102**	921	15
Your DENT code is: 2982**	902	15
Your DENT code is: 8173**	1,562	15
Use 874 9** to verify your Inst...	1,637	15
44** Verification Code from K...	874	15
73** is your Uber code.	933	15
WhatsApp code 401-5**	2,613	15
Rcedode 0040**	856	15
438** is your Steem confirma...	932	15
Telegram code 783**	870	15

OTHER SECURITY ISSUES

- Resetting the password → `Reset password link is : http://tinyurl.com/20170`
- Knowing the username → `new Gameflip password is 3C0eA9c5Tk
Gameflip username is D2ab01p5c9Jb`
- Link to verify account that will also log you in → `tap on this link to log in: https://t.me/login/20170`

PRIVACY ISSUES LEADING TO SOCIAL ENGINEERING

- Knowing the reservation number for a hotel or ID of transactions → `confirmed Booking JK06570 at OYO 13151 Hotel On Palace`
- Knowing the date, time, and exact location of appointments → `4:30 PM Today Dr. Borzoo Akbari 9201 W Sunset Blvd, Suite 710,`
- Knowing information about the customer who owns the account → `Latitude: 34.02559 Longitude: -118.45122 GPS location Date/Time:`

CONCLUSIONS

- What are people using these ephemeral messaging services for?
 - To not give away their real phone number or email
 - To message when they don't have a data plan
 - To receive important but repetitive emails
- What are the implications of ephemeral messaging on security and privacy?
 - Companies may have a bias or bug in their verification number generator
 - Allow strangers access to personal accounts
 - Disclose detailed personal information in public

ACKNOWLEDGEMENTS

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- Gradeigh Clark
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THESE MESSAGES ARE MOSTLY AUTOMATED

