Designing Social Media Tools for Emergency Response

Apoorve Chokshi, Agile Surface Engineering Lab
Motivation
2013 Southern Alberta Floods

- Bow, Elbow, Highwood, Red Deer, Sheep, Little Bow, and South Saskatchewan rivers and their tributaries affected

- 100K impacted in 30 communities
Calgary Emergency Management Agency (CEMA)

- Managed the emergency
- Uses a custom GIS
- Actively used Twitter
Related Work
Twitcident searches Twitter for relevant tweets during big incidents.

We show the most trustworthy and reliable tweets to fulfill common information needs of Twitter users during big incidents.

Would you like to use this service? Please enter your e-mail address and you will be notified as soon as we have relevant tweets.

Your@email.com

Welcome! We are redirecting you to Twitter to sign-in.
TwitCident searches real-time relevant tweets during big incidents

We show the most trustworthy and reliable tweets to fulfill common information needs of Twitter users during big incidents.

Would you like to use this service? Please enter your e-mail address and you will be notified as soon as we launch.

your@email.com
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Research Goals

1. Features for a real-time social media tool
2. Use-cases from emergency management
Development Process

1. Initial Meeting
2. Collection & Analysis of Twitter data
3. Requirements Elicitation
4. Design & Build Prototype
5. Evaluation
Initial Meeting

- CEMA / City of Calgary
- Security Group, University of Calgary
Twitter Data Collection

- Keywords: ‘bsd’ ‘uofc’ ‘ucalgary’ ‘yyc’ ‘calgary’
Evolution of BSD Tweets

<table>
<thead>
<tr>
<th>Category</th>
<th>Pre-BSD</th>
<th>BSD</th>
<th>Post-BSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTICIPATION</td>
<td>17</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>CELEBRATION</td>
<td>54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONSENT</td>
<td>35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>END BSD</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOURNING</td>
<td>84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEUTRAL</td>
<td>39</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>REMINISCE</td>
<td>2</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>User</td>
<td>Years worked / trained in emergency events</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>User 1</td>
<td>18 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>User 2</td>
<td>25 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>User 3</td>
<td>35 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>User 4</td>
<td>30 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avg. years of experience</td>
<td><strong>22 years</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Feature List Areas

- Post Mortem
- Twitter Trends
- Map-related features
- Twitter Timeline
Design & Build Prototype

- Two web-based clients
Design & Build Prototype

- Two web-based clients
  - Piu Monitors
  - Piu Observer & Piu Word Cloud
- Central server
Scenario Selection

Choose a scenario below...
- Live
- BMSF 2013
- 2nd Annual Flood 2014
- London Floods 2014
- Calgary Floods 2013
Muted Users
@CTVMorningYYC

Apr 18 2014 2:35 AM

Remembering the #BSD Five ~ Calgarians are invited to share stories & tributes here...
http://t.co/oEUm277wQd # yyc
http://t.co/BSnVgyj5Do
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Buttons for filtering and assessing
## Evaluation User Profile

<table>
<thead>
<tr>
<th>User</th>
<th>Title</th>
<th>Years worked or trained in emergency events</th>
</tr>
</thead>
<tbody>
<tr>
<td>User 4</td>
<td>Emergency Response Plan Coordinator</td>
<td>30 years</td>
</tr>
<tr>
<td>User 5</td>
<td>Emergency Volunteer Program Consultant</td>
<td>2 months</td>
</tr>
<tr>
<td>User 6</td>
<td>Communications Strategist</td>
<td>15 years</td>
</tr>
<tr>
<td>User 7</td>
<td>Media Relations Advisor</td>
<td>2 years</td>
</tr>
<tr>
<td>User 8</td>
<td>Admin Coordinator</td>
<td>2 years</td>
</tr>
<tr>
<td>User 9</td>
<td>Emergency Management Officer</td>
<td>15 years</td>
</tr>
<tr>
<td>User 10</td>
<td>Technical Writer</td>
<td>2 years</td>
</tr>
<tr>
<td>User 11</td>
<td>Emergency Management Manager / Business Continuity &amp; Recovery Planner</td>
<td>6 years</td>
</tr>
<tr>
<td>User 12</td>
<td>Geospatial Fusion Specialist</td>
<td>3 years</td>
</tr>
<tr>
<td>User 13</td>
<td>Business Continuity &amp; Recovery Planner</td>
<td>10 years</td>
</tr>
<tr>
<td><strong>Average user experience</strong></td>
<td><strong>8.5 years</strong></td>
<td></td>
</tr>
</tbody>
</table>
Evaluation Summary

- Tool was intuitive with easy-to-use features
- Participants provided new use-cases for Piu
Limitations

- Evaluation sample size
- City of Calgary / CEMA employees were unable to perform an individual assessment
- BSD-collected tweets may be incomplete
Future Work

- Pinned tweets area
- Twitter stream
- Features from commercial tools
Summary

- Requirements collected from emergency management domain experts
- Two clients created for real-time social media filtering and monitoring
- Qualitative study with emergency management users asserted that the features were domain appropriate
Thank You!