

4/27/2014

PROJECT PROPOSAL

HCDE 511



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Crisis Clinic: "When you need us, we're here!"

Crisis Clinic is at the heart of the Seattle-King County safety net providing a broad array of telephone-based crisis intervention and information and referral services. For many people in emotional distress or needing community services assistance, we are their "first call for help." Each year, we improve the lives of thousands of people by listening, caring and linking to services. "When you need us, we're here!"

-Source: <http://crisisclinic.org/about/>

Project Concepts and Goals

Every year, the Crisis Clinic receives hundreds of thousands of phone calls from King County residents in need of emotional support and community services. As a nonprofit organization, Crisis Clinic depends on the generosity of donors to keep its doors open and provide services. The Crisis Clinic's call data has not been visualized in many years. An interactive data visualization will allow them to better explore and understand patterns and trends in the calls they receive across geography and time. These insights will allow the staff to better provide resources in a targeted way, as well as communicate needs to stakeholders.

User and Tasks

1. "The IT Staff"



As a member of the IT staff, one of Hannah's responsibilities is to create annual reports that showcase critical statistics about the Crisis Clinic, including call volumes, demographics, and problems/needs reported. This report is used by the program directors, as well as local funders, to understand the current state of affairs and decide how to allocate resources. Hannah will be able to use the interactive dashboard to quickly add visual elements to her reports that highlight key trends and statistics throughout the year.

2. "The Program Directors"



As the director of 211 (The Community Information Line), Susan needs to be able to quickly answer inquiries from stakeholders about Crisis Clinic's operations; she recently received an inquiry asking how many Veterans have accessed services in Snohomish. Using the interactive dashboard, she is able to quickly use filters to scope down to this demographic and answer the question. If she is too busy, she will ask Hannah to help out.

3. "Town Funders"



Tom is responsible for figuring out how to allocate the City of Bellevue's state budget, and is reviewing the annual amount that is sent to the Crisis Clinic. He has a few questions about how people in Bellevue have been using the service. He is pleased when an interactive dashboard allows him to quickly answer questions, allowing him to quickly find information about key populations and types of services that are being accessed in his area.

The Data

The Crisis Clinic logs all of its calls into a 2009 SQL server database. Mike Maloy and Terry Morgan, part of the IT Staff, have granted us access to a server owned by the Crisis Clinic that provides a snapshot of the current database. This snapshot will be used to create an interactive visualization to be presented to the Crisis Clinic staff, which they may then choose to connect to their real database. They have also offered to help us strip out any personal data that is HIPPA protected before publishing the data publicly.

Key dimensions in the data set:

*Dimensions that we are particularly interested in exploring are indicated in **bold**.

Field	Description
City	City in King County that the call originated from
Zip code	5 digit zip code, within county
Other County	Choice: <county name>, out of state
Call Start Time	Start time of the call
Call End Time	End time of the call
Length of call	Duration of the call, in minutes
Program Type	Crisis Line, 211, Teen Link, Lifeline, Recovery Line
Gender	Male, female, transgender, other
Age	Age in years
Ethnicity	Self-identified ethnicity
Consumer Group	Homeless, Veteran, SOS, Disabled, etc.
Problem/Need	Lots of categories and subcategories: i.e. Animals, Basic Needs, Communicate, Community, Disaster, Emotional Health, Employment/Education, Financial, Legal, Physical Health, Relationships, Substance Abuse, Threat/Abuse/Violence
Income	Self-reported income, based on median in the state

Caller	Identify of the caller: self, agency/professional, family/friends, other
Household Composition	Individual adult male, Individual adult female, Supervised, Parents with minors, Other related adults without minors, Unknown, etc.
Number in Household	Number of people that live in the household
Number in Household under 18	Number of minors that live in the household.
Learned of Program	Where did the caller learn of the program? (Specific to Recovery Line)
Insurance	Type of insurance
Type of Caller?	Description of the type of caller, categorized in: CMI, AC, Other
Type of Call?	Description of the type of call, categorized into: Client Maintenance, Crisis, Info, Problem Solving
Current Treatment	Optional choice: N/A, None, Private, Public, Refused, Unknown, VA
CCPAR/Public	Name of agency
Suicide	Yes/No
Homicide	Yes/No
Number of Referrals	Number of referrals provided by the phone worked.
Name of referrals	List of referrals provided for a particular call.

The Interactive Visualization

We plan to produce an interactive dashboard that will allow stakeholders to answer the following kinds of key questions:

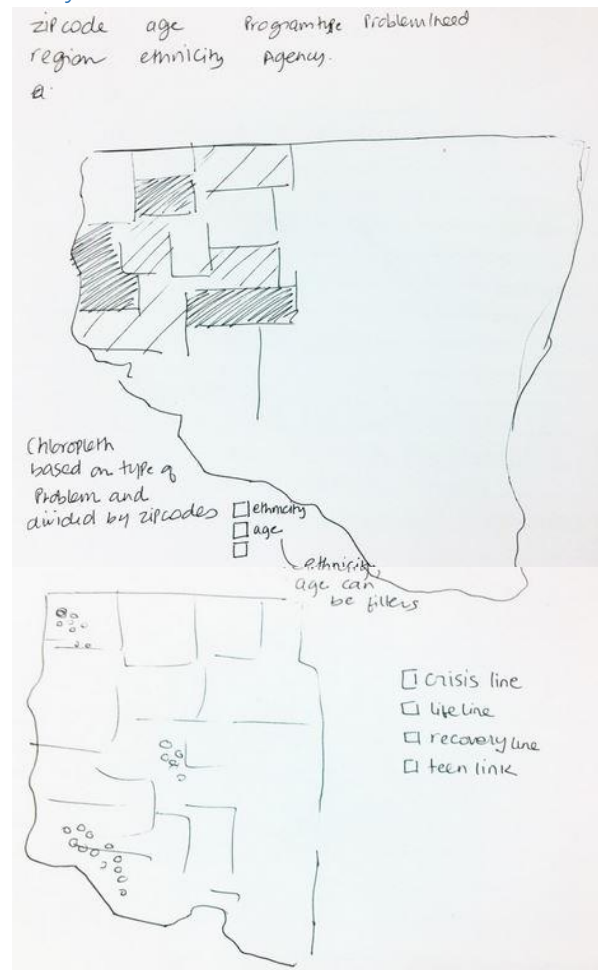
- What is the distribution of calls by cities in King County (i.e. Bellevue, Redmond, etc.)? Do certain cities have more types of calls than others?
- Are there peaks in call volume during certain times of the year and day, or special times of the year?
- What are the distributions of callers by other demographics; i.e. age, ethnicity, gender, veteran-status, income.
- What else can we discover?

We are planning to use **Tableau** as our primary method of data visualization. We think that Tableau is a good choice for this project, as it may be a flexible and robust platform for the Crisis Clinic staff to continue to change their dashboard over time as different needs arise, if so desired.

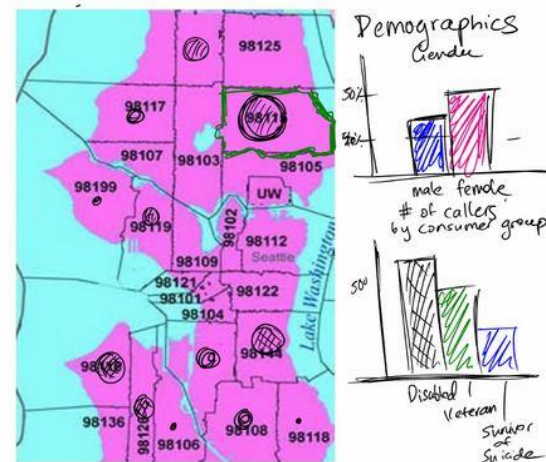
The two categories of visualizations that we are exploring to accomplish these tasks are:

- 1) An interactive visualization of a map that shows distribution of calls per region. Selecting a region will allow the user to view related graphs that show distributions of types of calls as per different caller demographics (i.e. ethnicity, gender, veteran-status).

Early sketches:

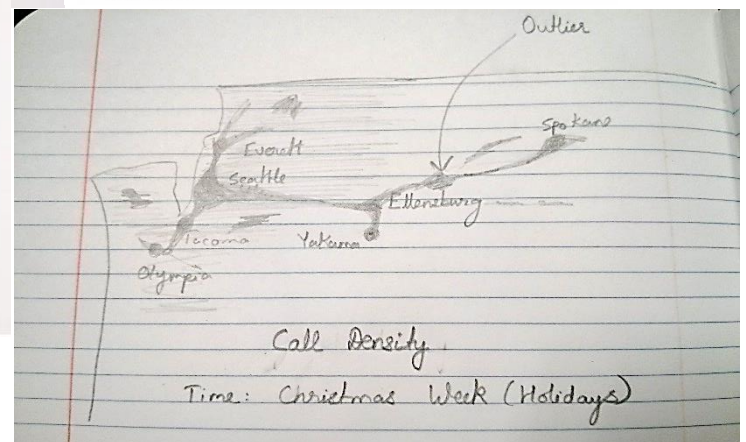


Number of Calls By Region



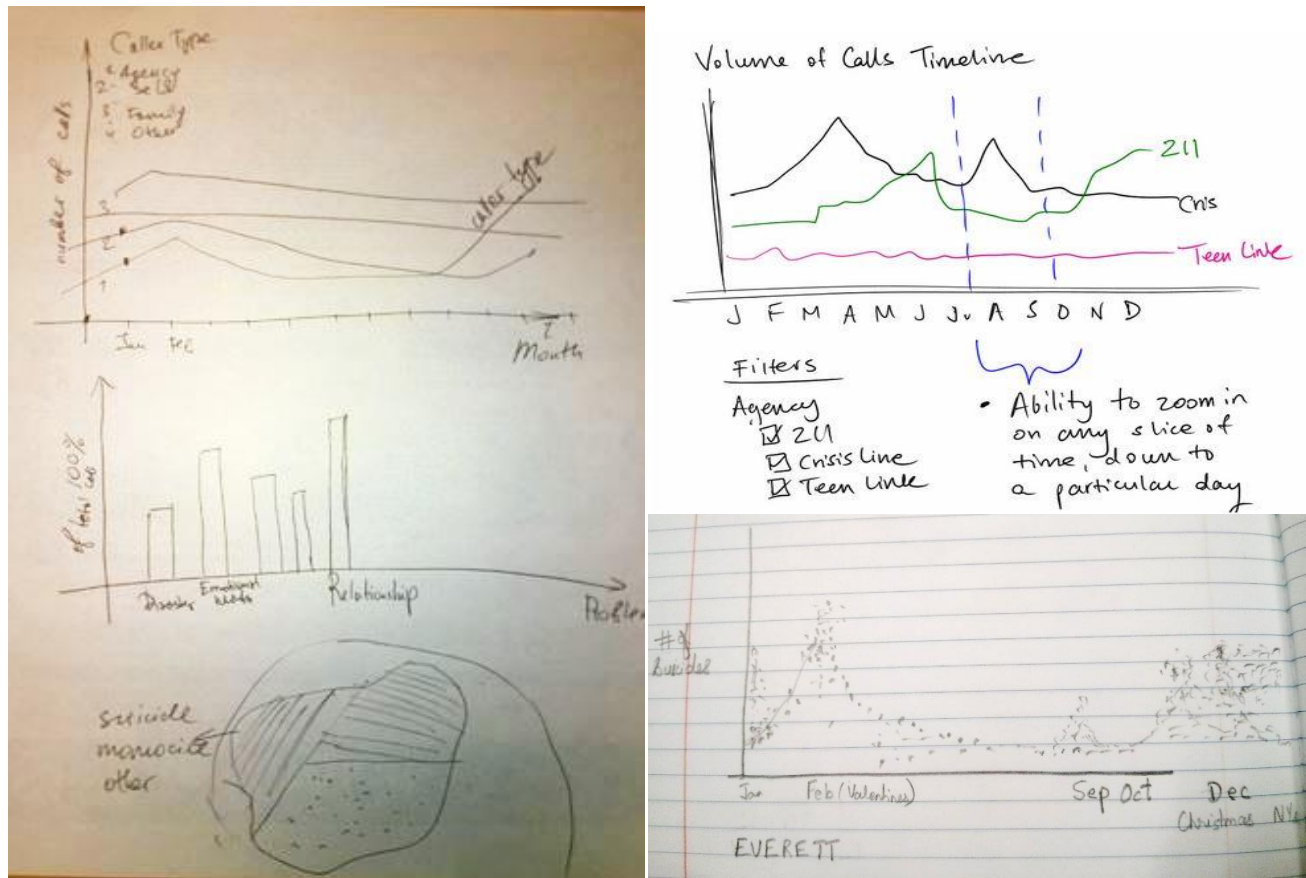
Filters

- Consumer Group
- ☐ Veterans
☐ Disabled
☐ Survivor of Suicide



- 2) A time series visualization that will show the number of calls reported over a period of time, starting per year and drilling down to months and days. The visualization should show trends based on different times of the day and week. Filters will be provided for key properties, such as call volumes to different service lines (i.e. 211, Teen Link, Crisis Line, Recovery Line).

Early sketches:



Scope and Risk

Because we are working with sensitive data, there are some potential limitations that we may have while manipulating it. For example, while the IT Staff strips out HIPPA-related data, we will only be able to access the database on the Crisis Clinic's servers, through remote desktop. This will potentially slow down development time, as performance is slower on the remote server than our local machines, and we will need to coordinate times when we are working with the data.

Furthermore, the database is rather large and complex, and we are still in the process of familiarizing ourselves with the way it is structured. According to Crisis Line's IT Manager, it may be difficult for us to successfully parse the "Problem/Need" section of the database, which indicates the type of problem reported or service requested. Although we would like to use these categories as filters on the above visualizations, it may turn out to be out of scope. The same may be true for other dimensions as we become more familiar with the data and how it is structured.

Finally, after interviewing the IT Staff further, we developed our third persona, "Town Funders", based on the feedback that they would like to be able to direct funders directly to this visualization

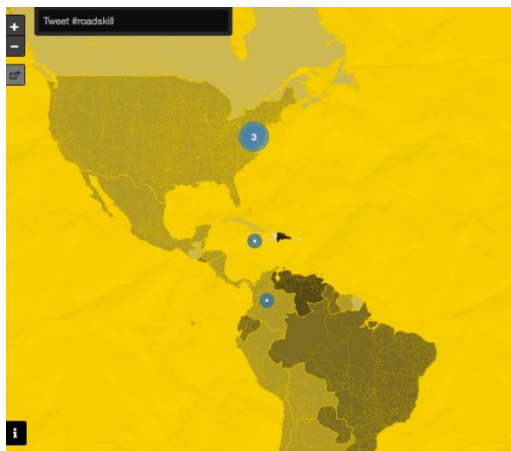
to answer their questions. Although we wanted to keep this persona on our radar, we are not sure that we'll be able to get access to them for usability testing; we also may not be able to get access to the "Program Directors". Because of this limitation, we are focusing on "The IT Staff" as our key customers, and treating testing with the other personas as a stretch goal.

Related Work

We plan on using existing data visualizations that feature linked geospatial and time-series designs to inspire us, as well as help us avoid potential pitfalls. Below are some examples of similar data visualizations we came across in the process of secondary research on our topic:

1. Interactive data visualization for global road safety data by Pulitzer Center

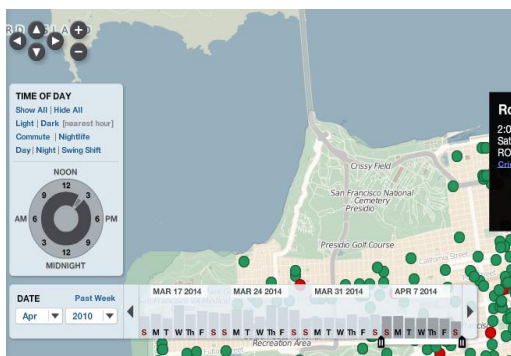
Source: <http://www.pbs.org/mediashift/2013/09/visualizing-the-global-road-safety-crisis/>



This is an example of a spatial overview with additional data visualization summaries revealed on mouseover. In this example, by clicking on a country you can access an assortment of road safety data, ranging from trend lines on highway fatalities to statistics on the types of vehicles most likely to be involved in fatal crashes. This is similar to the "details on demand" model that we may provide for our geospatial design.

2. "San Francisco Crimespotting"

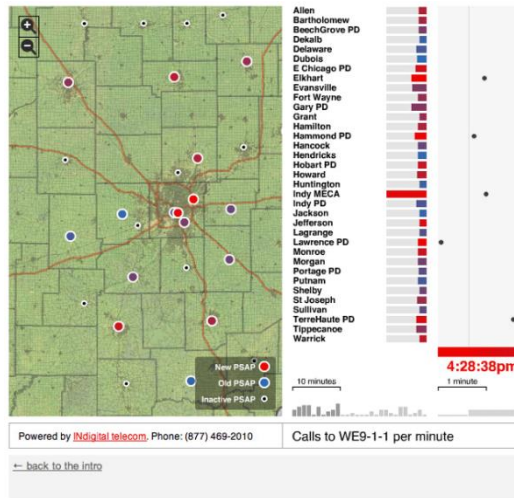
Source: <http://sanfrancisco.crimespotting.org>



This spatial visualization overlays crime events on a block by block basis. The users can filter by crime type, date and time of the day and find out the exact crime event by clicking on each point. In addition to information about the happenings in neighborhoods it helps answer questions about patterns like; is there more number of crimes this week than last week? More this month than last? A part of the idea here was similar to what we are aiming to accomplish for our client.

3. The INdigital Realtime Activity Display

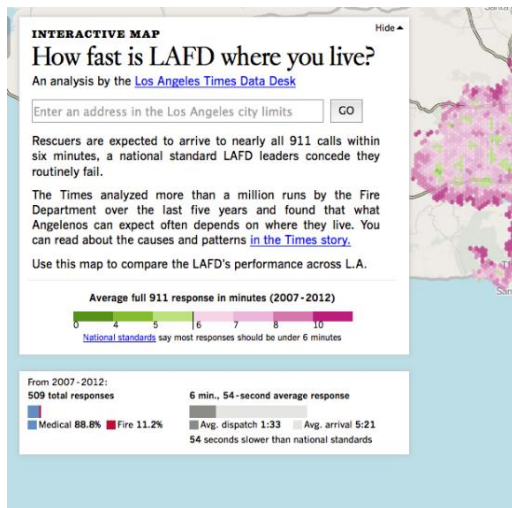
Source: <http://stamen.com/clients/indigital/>



This visualization shows 911 emergency calls from cell phones in Indiana in real time as they happen, and presents them on a map and timeline. Entries in the timeline are visually linked with counties, and sparkline at the bottom summarizes total call volume per hour. The density of points on the timeline graph makes it easy to identify “crisis times”—or times when the system was handling a very high volume of calls.

4. "How fast is LAFD where you live?"

Source: <http://graphics.latimes.com/how-fast-is-lafd/#10/34.0288/-118.5109>



This spatial map shows a block-by-block analysis of how long it takes LAFD units to reach victims after the agency picks up a 911 call. A pop up displaying further data is revealed on mouseover with statistics on average response time, the total number of responses over five years, the breakup of medical and fire related responses, and avg. arrival and dispatch times. Filters to the side further enable scanning the information based on neighborhoods as well as type of need (e.g. cardiac). This analysis helps reveal "simultaneous incidents" as a vexing issue and difficult to manage in some parts of the city with current staffing levels. This is similar to our goals for helping our client keep track of their calls.

As we work on the project, we will continue to investigate other visualizations that are similar, and any related guidelines and tips that have been proposed.

The Team

We are all interested in actively participating in all areas of the project, and expect that there will be a great deal of crossover between roles. With that in mind, we have assigned “area owners” that are responsible for ensuring that we are on track in each of the following key areas:

Team Member	“Title”	Responsibilities
Emily Greenberg	The “Project Manager”	Help coordinate meetings with stakeholders; ensure deliverables are on track and turned in on time; ensure schedule is on track and call out any areas of risk.
Abhigyan Kaustubh (AK)	The “Programmer”	Spearhead effort to understand the database and clean the data; investigate issues with Tableau and other issues that arise while coding.
Rijuta Trivedi	The “Designer”	Help with the overall design of the visualization and provide support with any other graphic assets required as part of the project and presentation.
Lana Pledger	The “Usability Evaluator”	Conduct usability studies with the stakeholder using paper prototyping, and final version of the product. Collect feedback and incorporate it in the design process.

The Schedule

Week 1: March 31st – April 6th

Tasks:

- Project Group Info forms completed; groups formed.

Week 2: April 7th – April 13th

Tasks:

- Initial team meeting; decided to investigate data sources related to public health and environmentalism, based on team members’ interests.
- Reached out to contacts in the field of public health (Graham Snead; Bill and Melinda Gates Foundation; Mike Maloy, Crisis Clinic), and searched other government sites for databases.

Week 3: April 14th – April 20st

Tasks:

- Decided to pursue Crisis Clinic, based on interest expressed by Crisis Clinic staff, promising availability of data, and team members' enthusiasm to address the needs of the client through a visualization.
- Prepared project proposal for feedback.

Deliverables:

- Project Proposal (Draft): due 5pm Saturday April 19th

Week 4: April 21st – April 27th

Tasks:

- Updated project proposal based on feedback.
- Interviewed Crisis Clinic IT Staff to better understand project requirements.
- With help of Crisis Clinic staff, developed a plan around how to access SQL database; determined that using Remote Desktop on Crisis Clinic's server is the fastest solution to gain access while data is scrubbed to remove personal information.
- Started sketching out based ideas using paper prototyping.

Deliverables:

- Access to database granted! (Monday, April 28th) (Note: finally accessed database slightly later than desired; schedule reflects this below)

Week 5: April 28th – May 4th

Tasks:

- Familiarize ourselves with the database and tables; perform exploratory database analysis; start to develop a plan on around any data that needs to be modified, cleaned, or exported in different formats; start any "cleaning" if possible.
- Flesh out mockups and wireframes of initial visualization ideas, using low to mid fidelity methods such as paper, Axure, etc.
- Run initial usability study based on paper prototypes with members of the IT Staff, record and report on feedback (not connected to real data).
- Based on database analysis and initial usability testing, iterate and refine questions, tasks, and visualization design.
- Prepare for midterm presentation.

Deliverables:

- Revised Project Proposal (due midnight Monday, April 28th)
- Low and mid-fidelity prototypes required for usability study (due Thursday, May 1st)

Week 6: May 5th – May 11th

Tasks:

- Finish mid-term presentation
- Continue any cleaning required of the data set to make it consistent and analyzable; ensure that dataset being used does not contain any personally identifying information (i.e. names removed, no identifiable outliers).
- Begin initial version of final data visualization in Tableau (complete functionality not required, but get core visualization components in place)

Deliverables:

- Mid-term presentation (due 5pm Tuesday, May 6th)
- Data set visualized successfully in Tableau for further usability testing (due Sunday, May 11th)

Week 7: May 12th – May 18th

Tasks:

- Complete any cleaning required of the data set to make it consistent and analyzable.
- Continue to develop data visualization in Tableau.
- Run another usability study on IT Staff using current visualization in Tableau; if possible, extend usability study to Program Directors and Town Funders (this week or next week); record feedback and findings.
- Incorporate findings from usability study into visualization plan.
- Refine questions and tasks based on current understanding of the data and usability testing.

Week 8: May 19th – May 25th

Tasks:

- If possible, extend usability study to Program Directors and Town Funders (this week or previous week), using current visualization in Tableau.
- Fine tune results and continue to develop visualization; start building a web interface to make visualization publicly available (Note: dependency on having personal data removed).
- Start final paper.

Week 9: May 26th – June 1st

Tasks:

- Continue to refine visualization.
- Ensure that visualization is publicly viewable in web interface.
- Prepare final project presentation.
- Continue to work on final paper.
- Present final visualization to Crisis Clinic staff (this week or next week)

Week 10: June 2nd – June 8th

Tasks:

- Complete any last touches on final project presentation and paper.
- Complete and review visualization.
- Submit final deliverables.
- Present final visualization to Crisis Clinic staff (this week or previous week)

Deliverables:

- Final project presentation (due Tuesday, June 3rd)
- Final project visualization (due Tuesday, June 3rd)
- Final paper (due Tuesday, June 3rd)