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Executive Summary:

In this report, we will cover the major functionalities of the website and the idea behind each one of them. At the same time, the business value of each functionality and APIs will also be explained. Additionally, we will include a competitive analysis to compare Curb Human Trafficking website with other current competitors. Finally, we will discuss our future plan and team member contributions.

Project Objective:

Human trafficking is the crime against humans of trading among people and is widespread globally. The most common forms of human trafficking include sexual slavery, forced labor, organ trafficking, etc. The U.S. Department of State (http://www.state.gov/j/tip/id/help/) defines 20 ways in which individuals can help fight human trafficking and this prompted us in building our website. The main objective of the application is to help fight human trafficking by creating and spreading awareness among people and to provide trafficking incident statistics across various police agencies in US that aids in public safety. Following are some of the ways that inspired us with the functionalities of our website:

1. Learn the red flags that may indicate human trafficking and ask follow up questions to help identify a potential trafficking victim. This can be achieved by human trafficking awareness training.

2. Incorporate human trafficking information into professional associations’ conferences, trainings, manuals, and other materials as relevant.

3. Help distribute public awareness materials.

4. Volunteer for local anti-trafficking organization.

System Architecture:
The system we designed is pretty simplistic and does not involve high costs, either for buying software or for maintenance purposes. Majority of the software that we used is open-source.

- The server we used is Apache Tomcat v7 that is open source
- Eclipse, the software development environment (SDE) used is open source
- Oracle 11g is the database used, which again is open source
- All the Java and Web APIs (Application Programming Interface) used are free to use
- Amazon EC2 is used for hosting the web application, which would cost only $12 per month

**Way the system works**

When a user logs into our website and browses around or places requests, the web server processes these requests. Data will either be retrieved from the database or from the interacting APIs. Hosting the web application on cloud gives us the advantage of improved computing power as well as storing the data on the cloud itself at a remote location.

**Novelty**

When compared to our competitors such as Polaris Project, Rescue Committee, Not for Sale, etc, the most important feature of our application that sets us apart from the rest of the competitors is integrating trafficking crime location on a map across different police agencies. The user can select a specific police agency in any state in US and we provide statistics of the number of sex and labor trafficking crimes along with other crimes and also a link to the specific police department.

Another novel feature of our website is the discussion board. This provides a common platform for every individual to join hands and work together to curb human trafficking. People can participate in discussions, ask questions, and find out views of other people to spread awareness.

These novel features are explained below.

**System Functionalities:**

1. “What we Do” web page – dictionary of trafficking terminology
2. Trafficking incidents Map – interactive Map interface with police agencies plotted across US
3. Media Stream – YouTube Channel, Twitter Feed, FBI and NYT feed
4. Collaborate – Discussion Forum
5. Donate option via PayPal
6. Social media share functions
7. Interactive analytics of human trafficking data

**Functionality Description:**

1. **“What we Do” Page:**
   When a user visits our website, he/she may or may not have familiarity with human trafficking terminology. Hence a “What we Do” page is provided in the web platform where a user can find answers to all basic questions related to human trafficking.
2. **Trafficking Incidents Mapping:**
The figure below is the complete interface for the “Map” function. The first drop down on the left allows the user to select a specific state. Once this is done, the second drop down will be automatically populated with all the police agencies in that specific state and the user can choose the one that he/she is interested in.
For each police station, a user can click on the logo for additional crime information. For all the police stations we have stored so far, we provide the total number of human trafficking related crimes and the total number of all the crimes happened in this area. By providing both statistics, users will have a better understanding of safety at a certain place. At the same time, we provide a website link of the police department if it has one. By clicking on “zoom to”, the map will be zoomed out to provide the specific street address of the chosen police station. So far we have gathered crime data from police stations of three states - Illinois, California and Arizona. All the data is fetched through different police station APIs to our database, so the data we provide is very concurrent and valuable.

All the location information for the police stations is stored in our database. Once a specific station is selected by the user, the location information will be parsed through ESRI API and will map the location on the ESRI map.
3. Creating awareness through “MEDIA”:

Media is one of the well-known ways to create awareness. This media may include pictures, videos or even social media. Keeping this mind, we have collected a large number of videos posted by victims of human trafficking and other awareness videos and updated them to a separate channel. We have included this channel in you-tube player and made it available on our media page. Also there is an additional user subscription feature provided to individuals who are interested in following this channel.

4. World-Wide Human Trafficking feed:

This is the second step in creating awareness to an individual through our web platform. Here we have provided twitter feed which displays live feeds related to human trafficking. We also have a FBI feed which displays live feed on “crimes against children” and a New York Times feed which displays current human trafficking incidents happening around the world.
5. **Discussion Board:**

The “Collaborate” feature provides a unique web platform for each and every individual to interact at one place and participate in discussions related to human trafficking. If an individual interested in knowing more about human trafficking and ways to curb human trafficking, he can post queries or participate in discussion with other individuals who are actively involved. There are many additional benefits as well. A user can login using his social networking website accounts, rate a post and share a post to his/her social web page and can also upload images/videos. By clicking on the “Human Trafficking” tab, a user can see which user is contributing the most and which one is a highly rated comment. Admin can also download all the posts in future and this data can be used for analytics. In this way, this feature helps in providing a unique web platform where individuals can collaborate and contribute towards curbing human trafficking.

6. **PayPal – Donate option**

This function is an important component to our business plan. Since “Curb Human Trafficking” is a non-profit website whose mission is to create a world where no one is for sale, the major part of our revenue will generated by this function. With PayPal secure payment, users will be able to donate any amount of their choice to our public PayPal account to help with the maintenance of our website and anti-human trafficking activities.
**Leveraging Social Media:**
We have also included login and share options for individuals such as “facebook” login, “Googleplus” login and facebook share, twitter share and like options.

8. **Interactive Analytics:**

Analytics forms a very important part of our application. As human trafficking is a very broad term that involves multitude of crimes, the analytics will predominantly concentrate on sex trafficking and labor trafficking in US which, according to US Department of State, the most common crimes under the large umbrella of human trafficking.

Below are the analytics that we have implemented for the aforementioned subset of human trafficking crimes. It is important to note here that the data considered for the analytics is on cloud and the charts are not static visualizations.


Data Source: Data.gov, NHTRC (National Human Trafficking Resource Center)

The data gathered was cleansed to include sex and labor trafficking crimes. For this section of analytics, other human trafficking crimes were also included under the name “Unknown Trafficking” to show the overall trend of these crimes across years.

A dashboard was built using Tableau Public to show the trends of crimes against 4 categories – year, age, race, and gender. Users can choose a crime of their interest (for example, sex trafficking) from the legend box to see the trend of that specific crime against all the categories.

Data Source: Data.gov, NHTRC (National Human Trafficking Resource Center)

The USP of the analytics page is this very section – interactive video visualization. This was built using Google Charts that shows the trend of sex / labor trafficking crimes over the years across different states. Currently we have considered 3 states (California, Florida, and Texas) and years from 2009 to 2013; this can be expanded to include all the states in US. Users have complete control over the entire chart. They can change the axes according to what they want to see. Below is a sample screenshot of the axes with values that users can choose from.

**Axes values:**

![Sample Screenshot of Axes Values](image1)

They can choose the states and also colors for them. They can even adjust the speed of the video. Once the play button is pressed, the graph shows the trend of crimes according to the choice of the user. Users can also choose different kinds of visualizations such as bar graph and line graph.
c. Twitter Analysis: Sex & Labor Trafficking

Data Source: Twitter

Twitter is a platform in which people discuss about different issues. This makes it a very vital source from which we can extract important details and this is the reason why we have considered this data source to perform analytics related to sex and labor trafficking. The data was collected from April 30, 2014 to May 4, 2014.

There are three different kinds of analytics / visualizations in this section which are common to both sex & labor trafficking.

i. Word Cloud

ii. Most Common Tweeters

iii. Everyday Tweets

For illustration purposes in the report, we will be showing the analytics related to sex trafficking.

Word Cloud

The purpose of this is to show users the common words in the discussions related to sex trafficking. At one glance, users will know the sub-topics and important points of discussions.

The word cloud was built using Tableau. To build this, the tweets collected from twitter had to be pre-processed to remove common stop words such as a, it, the, is, etc. After filtering out these words, a file was obtained that had only relevant words to build the word cloud.

Below is the screenshot showing the word cloud of sex trafficking. It can be learnt at one glance that people are discussing about strip clubs, prostitution, etc.

Most Common Tweeters

This bar graph shows the most common tweeters (twitter screen names and number of tweets) who discuss about sex trafficking. The tool used to build this is Tableau Public.

The main purpose of this graph is to allow users to connect / follow people on Twitter who share the same interests as that of the user. The tweeters may or may not be providing important information
related to crimes; they may just be posting questions, but our main intention of doing this kind of analytics is to allow users to follow people on Twitter who contribute to discussions / get involved in them. To connect to a specific person, hover the mouse over the bar graph against his / her screen name. A pop-up will appear with the link to their Twitter profile.

**Everyday Tweets**

This graph, also built using Tableau Public, shows the trend of discussions on Twitter across multiple days. Apart from the trend, this also gives an idea to the user of the volume of tweets on a certain day.

**Business Model:**

The main purpose of our website is to provide service to people by creating awareness of human trafficking. But to do what we do i.e., to maintain the website and cost associated with data collection and analysis, we need to generate revenues. The explanation of our business model or sources of revenue relies on the fact that we are providing unique features on our website (which is explained in the “Novelty” section of the report) and mash-ups that can of use to various parties.
The major source of revenue would be through funds / donations from public. Ours is a website that is service-oriented and is doing something good to spread awareness of human trafficking and to improve public safety. This makes us a legitimate entity to seek funds. There are also a lot of NGOs that initiate campaigns / awareness programs related to trafficking. Our website can be used as a platform to publicize these events and NGOs can post their invitations to such events on our website. This opens up a window to seek donations from NGOs as well.

Another source of revenue is travel websites. These websites can integrate our API (paid) to offer our services to people. People who use the travel websites to plan their trip will be able to know the safety of a particular place and be aware of various crimes happening at that place.

An extension to the above described source of revenue is property websites. Before deciding on a particular place to buy a property or house, users will be cognizant of the spread / number of crimes at that place.

The statistics that are showed on the ESRI map was done using the data collected from different police agencies. These statistics or analytics can be of use to these police agencies to display on their respective websites as well. This fact can leveraged upon to sell our analytics to police agencies or other government bodies and these become other sources of revenue.

We have also estimated the percentage of revenues that can be generated through the various sources. The below picture summarizes the business / revenue model of our application.

**Competitive Analysis:**

We have identified Rescue Committee, Polaris Project and Not for Sale as our possible competitors. But the advantages with our proposal when compared to these competitors are manifold.

We have interactive graphs and charts as part of analyzing the data and present important statistics to the user. This makes it easier for the user to lap up data and also to draw conclusions.
We also have a discussion board, which our competitors do not have. This is a forum for people to follow and connect with organizations and people who are actively engaged in anti-human trafficking activities, and do something for the cause.

A detailed matrix showing a comparison between us and our competitors can be seen below

<table>
<thead>
<tr>
<th>Features</th>
<th>Rescue Committee</th>
<th>Polaris Project</th>
<th>Not for Sale</th>
<th>Curb Human Trafficking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interactive Crime</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>✓</td>
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<tr>
<td>Analytics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discussion Board</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>✓</td>
</tr>
<tr>
<td>Crime Mapping</td>
<td>X</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
</tr>
<tr>
<td>Donate</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Featured Videos</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>News &amp; Updates</td>
<td>✓</td>
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<td>✓</td>
<td>✓</td>
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<tr>
<td>International</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
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<tr>
<td>Trafficking</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Report Incident</td>
<td>X</td>
<td>✓</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**Future Plan:**

Human Trafficking is one of the worst issues afflicting mankind. We, at Team Curb Human Trafficking, envisage a world where nobody is up for sale. We see a need for such a platform where public safety can be improved as well as raise awareness about this issue. Hence, as part of our future plans, we intend to

- extend our public safety maps to include more states and police stations
- develop maps for address based neighborhood search
- develop our own API for property search engines
- integrate missing people information

On the **business front**, we intend to

- develop more anti-human trafficking partners
- capture the market available for potential analytics users
<table>
<thead>
<tr>
<th>Team Contribution:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pavan Bulusu</strong></td>
</tr>
<tr>
<td>• YouTube APIs</td>
</tr>
<tr>
<td>• Functionalities Planning</td>
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<tr>
<td>• DISCUS API</td>
</tr>
<tr>
<td><strong>Samanth Chundi</strong></td>
</tr>
<tr>
<td>• Database &amp; Cloud Hosting</td>
</tr>
<tr>
<td>• RSS &amp; FBI Feed APIs</td>
</tr>
<tr>
<td>• Analytics, Visualizations</td>
</tr>
<tr>
<td><strong>Sivaram Mallampati</strong></td>
</tr>
<tr>
<td>• Front End Programmer</td>
</tr>
<tr>
<td>• Esri API and Crime Mapping</td>
</tr>
<tr>
<td><strong>Shuhan Yang</strong></td>
</tr>
<tr>
<td>• Social Login APIs</td>
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<tr>
<td>• Chicago ClearPath API</td>
</tr>
<tr>
<td>• Paypal API</td>
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</tbody>
</table>