Hope Lives Here:
Mapping Hope to Direct Community Investment

MSIT eBusiness Technology • Practicum Project 2015
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Introduction

This report contains the software documentation and user’s manual for the application developed at the MSIT e-Business Technology Practicum for Neighborhood Allies.

The Hope Mapping Tool is the first one of its kind to systematically measure levels of hope in communities and visualize them on a map. It also serves the purpose of providing dynamic analytics related to the factors of hope and impact of social projects. Furthermore, this is a software extension of the methodology for defining and measuring hope in a community designed by Neighborhood Allies on a separate document.

The Hope Mapping Tool consists of the following components:

1. A publicly available HTML website under the domain [http://hopeliveshere.life](http://hopeliveshere.life)
2. A publicly available "Map of Hope" developed in JAVA-JSP accessible through the website.
3. A publicly available "Hope Survey" developed in JAVA-JSP accessible through the website.
4. A private administrative panel developed in JAVA-JSP connected to the website.

Additionally, the developing team is submitting the following products:

- Software back-up copy available at GitHub repository.
- User’s Manual and Documentation Report
1. Users Access Controls

1.1. Login and Logout
Only internal employees are able to log in to use the administrative panel and related functions. In order to access the admin panel, the admin user can click on the link “Employee Access” on the bottom of the homepage.

Please note that the default admin email is sendemailna@gmail.com and the password is mappinghope2015. The user can log out by clicking the link on the top of the page.

The password is encrypted with MD5 algorithm in the database. It is a widely adopted industrial standard technology to protect credential security from outside and internal hacking.
1.2. Add New Users
Any registered user account can create new user accounts by clicking on the link on the top of the page. An email address and password will be requested for the new user’s account.

1.3. Change Password
To change a password, click on the link inside the user options icon on the top bar of the admin panel page. You will be redirected to a form where you can enter the new password. It is not possible to remove users from the admin panel, therefore if you wish to deactivate a user account, you should enter into that account and simply change the password to avoid future access.
1.4. Recover Password
Forgotten passwords can be recovered by clicking the “Forgot Password” link on the login page. After providing your email, the password will be sent to that email address if it exists in the database.
2. Dashboard Functionalities

2.1. Information Boxes

In the information box, you can see how many survey answers have been submitted. The next box on the right indicates how many community goal parameters exist at the moment, whether or not they are being displayed on the map.

2.2. Dashboard Table

In the dashboard table you can see a statistics table related to neighborhoods in the most recent year. In the first row, I is short for importance, B for barrier and O for opportunity. The table provides a dynamic search functionality so you can easily navigate through the neighborhoods. For viewing historical information, you can do it using the analytics tools on the map tool.
2.3. Update Map

Updating the map means that the system will collect all the new survey answers that have been submitted, along with new parameters and datasets imported and update the heat map layer and the analytics. The map cannot get updated on real time upon every submission since this would demand an extremely high use of resources which in its turn make the map slow or even nonfunctional. For this reason, when you have collected an amount of new information that you consider appropriate you can click the “update button”. It is recommended that you turn off the map while doing this and then turn it on again.
2.4. Turn on/off Survey
If you want to turn on the survey, turn the slide bar to the right. If you want to turn off the survey, turn the slide bar to the left. This will cause the survey not to display and instead a temporary offline placeholder will appear.

![Survey Slide Bar]

2.5. Turn on/off Map
If you want to turn on the map, turn the slide bar to the right. If you want to turn off the map, turn the slide bar to the left.

![Map Slide Bar]

2.6. Twitter Plugin
There is a twitter plugin on the right side of the dashboard. It shows the tweets related to the topic of #HopeLivesHere. If you want to post tweets on the widget, you can use the bottom type field. In order to change the Hashtag (#) you can do so directly on Neighborhood Allies Twitter account, under user settings -> Widgets -> Edit HopeLivesHere. Any change there will be automatically reflected in the dashboard.
Social Buzz

#HopeLivesHere

NYC Rescue Mission
@NYCRescue

Thank you, @olitebeauty - because of you, our ladies were all smiles yesterday! #HopeLivesHere #Inspiration #Beauty plc.twitter.com/1L/G5a2Au6

Stella's Circle
@StellasCircle

@ReflectiveMKidg We've just started using it! #HopeLivesHere #nonprofits

Expand

@Ray445566

Go go #HopeLivesHere

r44

Tweet #HopeLivesHere
3. Data Import

3.1. Obtain Raw Data

In order to keep the map updated, Neighborhood Allies should once a year obtain raw data and import it to the system’s database. There are additional guidelines provided on the “Obtain Data” page. The main data sources are American Community Survey, Southwestern Pennsylvania Community Profiles, the University of Pittsburgh Center for Social and Urban Research main website, Center for Statistics of the University of Pittsburgh, National Neighborhoods Indicators Partnership and walkscore.com.

For the American Community Survey, you can obtain the data directly on the admin panel frame provided. For all the other sources the links provided will open an independent window. You should download the data on separate files and then follow the instructions on “Generate Template”.

![Image of FactFinder](image)
3.2. Generate Template

Once you have the raw data sets, you need to process them and format the data in the way the tool expects it. For this, a dataset template should be generated and filled. In the Generate Template page, the user can choose the year and community goal parameter desired. When clicking “Generate CSV template” a CSV file (which is readable with MS Excel) will automatically download on your computer.

*Note: Remember to consider if the data you are using should be converted to indices, especially when the values depend on the size of the population of a neighborhood.

If you want to import data for a new parameter, please add it on the “Hope Parameters” section first.
3.3. How to Use the Template

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Year</td>
<td>Parameter</td>
<td>Neighborhood</td>
</tr>
<tr>
<td>2</td>
<td>2015</td>
<td>Health Care</td>
<td>Allegheny Center</td>
</tr>
<tr>
<td>3</td>
<td>2015</td>
<td>Health Care</td>
<td>Allegheny West</td>
</tr>
<tr>
<td>4</td>
<td>2015</td>
<td>Health Care</td>
<td>Allentown</td>
</tr>
<tr>
<td>5</td>
<td>2015</td>
<td>Health Care</td>
<td>Arlington</td>
</tr>
<tr>
<td>6</td>
<td>2015</td>
<td>Health Care</td>
<td>Arlington Heights</td>
</tr>
<tr>
<td>7</td>
<td>2015</td>
<td>Health Care</td>
<td>Banksville</td>
</tr>
<tr>
<td>8</td>
<td>2015</td>
<td>Health Care</td>
<td>Beechwood Dwellings</td>
</tr>
<tr>
<td>9</td>
<td>2015</td>
<td>Health Care</td>
<td>Beechview</td>
</tr>
<tr>
<td>10</td>
<td>2015</td>
<td>Health Care</td>
<td>Belzhoover</td>
</tr>
<tr>
<td>11</td>
<td>2015</td>
<td>Health Care</td>
<td>Bloomfield</td>
</tr>
<tr>
<td>12</td>
<td>2015</td>
<td>Health Care</td>
<td>Bluff</td>
</tr>
<tr>
<td>13</td>
<td>2015</td>
<td>Health Care</td>
<td>Bon Air</td>
</tr>
<tr>
<td>14</td>
<td>2015</td>
<td>Health Care</td>
<td>Brighton Heights</td>
</tr>
<tr>
<td>15</td>
<td>2015</td>
<td>Health Care</td>
<td>Brookline</td>
</tr>
<tr>
<td>16</td>
<td>2015</td>
<td>Health Care</td>
<td>California-Kirkbride</td>
</tr>
<tr>
<td>17</td>
<td>2015</td>
<td>Health Care</td>
<td>Carrick</td>
</tr>
<tr>
<td>18</td>
<td>2015</td>
<td>Health Care</td>
<td>Central Business District</td>
</tr>
<tr>
<td>19</td>
<td>2015</td>
<td>Health Care</td>
<td>Central Lawrenceville</td>
</tr>
<tr>
<td>20</td>
<td>2015</td>
<td>Health Care</td>
<td>Central Northside</td>
</tr>
<tr>
<td>21</td>
<td>2015</td>
<td>Health Care</td>
<td>Central Oakland</td>
</tr>
<tr>
<td>22</td>
<td>2015</td>
<td>Health Care</td>
<td>Chartiers City</td>
</tr>
<tr>
<td>23</td>
<td>2015</td>
<td>Health Care</td>
<td>Chateau</td>
</tr>
<tr>
<td>24</td>
<td>2015</td>
<td>Health Care</td>
<td>Crafton Heights</td>
</tr>
<tr>
<td>25</td>
<td>2015</td>
<td>Health Care</td>
<td>Crawford-Roberts</td>
</tr>
<tr>
<td>26</td>
<td>2015</td>
<td>Health Care</td>
<td>Duquesne Heights</td>
</tr>
<tr>
<td>27</td>
<td>2015</td>
<td>Health Care</td>
<td>East Allegheny</td>
</tr>
<tr>
<td>28</td>
<td>2015</td>
<td>Health Care</td>
<td>East Carnegie</td>
</tr>
<tr>
<td>29</td>
<td>2015</td>
<td>Health Care</td>
<td>East Hills</td>
</tr>
</tbody>
</table>
You should open the generated template. You will notice that the file already includes the year, parameter and list of neighborhoods.

Year will be listed as first column, parameter second column and neighborhood as third column. Value will be listed as fourth column.

A CSV file stands for Comma Separated Value, usually MS Excel will have no problems opening this files automatically. However, if the csv file is not imported correctly into Excel, you can follow video: Importing CSV Files into Excel or video: How to Import CSV File Into Excel to import csv file into excel step by step. All columns are separated by comma, meaning that the delimiter in csv file is comma. This might be asked if you are importing the files on Excel manually.

Once you open the template you only need to input values on the “VALUE” column.

* Note: Only add numbers or decimal point in that column. Symbol such as $, %, * or - will result in invalid values during import. If the value of some neighborhood is not available, you can leave that column blank. If value of one neighborhood is blank in import file, it will be set as the average value of all neighborhoods.

Once finish adding the values, save the file as csv file. Video: How to export or save a .csv file from Excel is a good reference on how to export csv file from excel.

### 3.4. Import a Ready Template

Finally, you need to import the formatted data into the system’s database by uploading the recently saved csv file. In the Import Ready File page, you need to indicate the year and parameter that you will import to the database. Also whether this statistic is a positive or a negative statistic.

For example, House Income Median for Income is a positive statistic since a higher value is expected to produce higher hope. On the other hand, Crime Rate for Safety is negative since a higher crime rate would potentially reduce hope. If there is any mismatch or missing value, there will be error message on the top of the webpage. Detail information is listed as following:

When all content is valid, a preview page will show up. You will see a table with data you can complete the import step. Values that are missing will be set as the average number among all neighborhoods and they will be displayed in red color.

* Note: You are encouraged to double-check all data in the preview page. The system does not allow deletion or modification of already imported data. If later you no longer want to use that data, you have an option to not use it for the map in the parameters management section.
If everything is correct, click Confirm Upload button. The data of that parameter in that year will be imported into database.

### 3.5. Validation of Values Notice

The following are error checking validations that are performed when importing templates:

<table>
<thead>
<tr>
<th>Error</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Import file is not a csv file</td>
<td>Please upload csv file.</td>
</tr>
<tr>
<td>Number of rows does not match template</td>
<td>Please double check the lines of your input file.</td>
</tr>
<tr>
<td>No value is added in template</td>
<td>Please add value in csv file.</td>
</tr>
<tr>
<td>Missing column (year, parameter or neighborhood) on line X</td>
<td>Please double check the number of columns on line: X</td>
</tr>
<tr>
<td>Year on column 1 does not match the indication on upload.do on line X</td>
<td>Please double check the year on line: X</td>
</tr>
<tr>
<td>Parameter on column 3 does not match the indication on upload.do on line X</td>
<td>Please double check the parameter on line: X</td>
</tr>
<tr>
<td>Neighborhood name on column 4 does not match names in template on line X (Order is irrelevant here)</td>
<td>Please double check the neighborhood name on line: X</td>
</tr>
<tr>
<td>Value on column 5 is not a valid value. (Only a number is accepted, leaving it blank will be considered as that value is unavailable)</td>
<td>Please double check the value on line: X</td>
</tr>
</tbody>
</table>
4. Survey Management

4.1. View Existing Surveys
Open the “View Surveys and Answers” item on the left menu under “Manage Survey” tab. This will display the view survey questions form.

Select the survey version you want to look at and then click on the “View” button.

The community goal parameters, importance perception questions, opportunity questions and barrier questions from that survey version will show in the table. For parameters that use statistics as the barriers, a message will indicate you that there is no barrier question in the survey for this parameter.

4.2. Download Survey Answers
Once you select a survey version, you can click “Download” button in the bottom of the page. This will download the survey answers in a csv file format for this survey version. Each row represents a survey record.

4.3. Remove Survey Answers from Database
If you want to remove survey answers from the database. You need to:

1. View the survey version where the answer to be deleted is located
2. Obtain the Result ID number, which is indicated on the first column of the csv file.

3. Click on “Remove Answer” and type in the survey result ID. Then click the X button and confirm.

4.4. Edit Existing Surveys

You can edit existing surveys of any version. To do this click on “Manage Survey” on the left sidebar and go to the “Edit Survey Question” item.

When editing an existing survey, any new changes will be made on the basis of the selected survey and a new version will be created. Please note that every parameter must have an Importance and an Opportunities question. The Barriers question is optional in case there is no statistic for such parameter.

If a barrier question is added, all of the four answers must be provided for this parameter. The scale from 0 to 4 will always be the same, but you can edit the text for each value.

All the Importance questions will take answers on a scale from 0 to 5 indicating Low to High Impact on personal motivation. The meaning of the scale from 0 to 5 will be the same for all the importance questions in that survey.
Any number of extra questions can be provided. There is no requirement or format on it. They will be shown on the survey at the end and an empty text field will allow users to type any answer. These answers do not affect the hope calculation, but you can download the answers for your own analysis using the download answers option described in section 4.2.

By clicking “Return to Survey Editor” button, no change will be saved to the survey.

When you click "Save Survey", an alert window for confirmation will pop up. Once confirmed, a new survey version will be created and stored. The page will remain the same, do not click on “Save Survey” again since this will indicate the system to create another copy. This new survey will be considered as the latest version, and will automatically be the one to display publicly when the survey is turned on through the Administrative Panel. Therefore, all changes made on the survey become publicly available immediately.

*Note: The survey versions stored serve as templates for future use and for your historical review, but you cannot choose which survey to display, the system will always choose the latest.

4.5. Create New Survey
You can create a completely new survey from scratch. The process is exactly the same with Edit Existing Survey, except that there you will not see any text in the fields.

4.6. Delete Survey
If an existing survey is believed to have no use, it may be deleted. An alert window for confirmation will pop up before it is deleted. Once it is deleted, all the survey questions will be removed from the database. This action is irreversible.
4.7. Online Survey

This is a publicly accessible page where people can submit the survey. Users need to fill in the demographic data, such as race, age range, gender, home address. For address, people need to fill in an address or neighborhood name and then click the Validate button on the right to obtain the neighborhood’s official name and crosscheck with the database. The address is only for validating the neighborhood, the system does not store it. If users do not feel comfortable providing their home address, they can also use the neighborhood name or a nearby address to validate the neighborhood.

Demographic Information

Please indicate the following information:

- Race: 
- Gender: 
- Age Range: 

Home Address: e.g. 3241 Centre Ave, Pittsburgh PA 15232
Neighborhood: Click on validate to get neighborhood

The survey is designed not be submitted within 30 minutes from the same IP address. After they submit the survey, they need to wait for 30 minutes to submit another one. But when using admin account it can be submitted without any limitation.

After the demographic data, there are survey questions. On the top there is the community goal or parameter name. Below, on the left side is the importance question and Opportunity question is on the right. Under the importance question, an optional barrier question appears. For some parameter there is no barrier question. On the opportunities question, if the user chooses "Yes, I know at least one", there will be a text field to let people fill in the projects they are aware of. Users are asked to use comma to separate each community program and the system will take every come as a separator for a new project and increase the count.
When I think about the aesthetic for a neighborhood, such as the looks and maintenance of public space including streets, bus stops and parks:

- I don't know / I prefer not to answer
- This factor may slightly affect my personal motivation
- This factor can moderately affect my personal motivation
- This factor can considerable impact my personal motivation
- This factor can highly impact my personal motivation

Have you ever used or known of any community program available to you that addresses this factor? If so, please list them below:

- No, I am not aware of any
- Yes, I know at least one

How good does your neighborhood look compared to others? (Overall Aesthetics)

- The bias does not exist
- The bias is understandable and acceptable
- The bias is understandable, but unfair
- The bias is unfair and there should be changed
## 5. Parameter Management

### 5.1. View Existing Parameters

In the admin panel, by clicking “Manage Parameters” on the left sidebar the admin user can view all the existing hope parameters.

For each parameter, the table will show a list of survey version answers, as well as the statistics from different years that are being used in the map. Every data block of a survey answer contains Importance data, Opportunity data and Barrier data (For optional parameters). In other words, the answers of a survey come as a bundle. The info icon behind each data name indicates the real name of the survey or CSV file.

<table>
<thead>
<tr>
<th>Showing In Map</th>
<th>Parameters</th>
<th>Surveys Used in Map</th>
<th>Statistics Used In Map</th>
<th>Delete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Health Care</td>
<td>Answer from 2015</td>
<td>None</td>
<td>Delete</td>
</tr>
<tr>
<td>Yes</td>
<td>Income</td>
<td>Answer from 2015</td>
<td>None</td>
<td>Delete</td>
</tr>
<tr>
<td>Yes</td>
<td>Employment</td>
<td>Answer from 2015</td>
<td>None</td>
<td>Delete</td>
</tr>
<tr>
<td>Yes</td>
<td>Public Schools Quality</td>
<td>Answer from 2015</td>
<td>None</td>
<td>Delete</td>
</tr>
<tr>
<td>Yes</td>
<td>Higher Education and Training</td>
<td>Answer from 2015</td>
<td>None</td>
<td>Delete</td>
</tr>
<tr>
<td>Yes</td>
<td>Small Business Funding</td>
<td>Answer from 2015</td>
<td>None</td>
<td>Delete</td>
</tr>
<tr>
<td>Yes</td>
<td>Cost of Living</td>
<td>Answer from 2015</td>
<td>None</td>
<td>Delete</td>
</tr>
<tr>
<td>Yes</td>
<td>Safety</td>
<td>Answer from 2015</td>
<td>None</td>
<td>Delete</td>
</tr>
<tr>
<td>Yes</td>
<td>Transportation</td>
<td>Answer from 2015</td>
<td>Statistics from 2015</td>
<td>Delete</td>
</tr>
<tr>
<td>Yes</td>
<td>Community Engagement</td>
<td>Answer from 2015</td>
<td>None</td>
<td>Delete</td>
</tr>
<tr>
<td>Yes</td>
<td>Criminal Record Biases</td>
<td>Answer from 2015</td>
<td>None</td>
<td>Delete</td>
</tr>
<tr>
<td>Yes</td>
<td>Public Space Aesthetics</td>
<td>Answer from 2015</td>
<td>None</td>
<td>Delete</td>
</tr>
<tr>
<td>Yes</td>
<td>Services vicinity</td>
<td>Answer from 2015</td>
<td>Statistics from 2015</td>
<td>Delete</td>
</tr>
</tbody>
</table>
5.2. Add New Parameters
A new community goal parameter can be added at the bottom of the parameter list. A parameter name is required, while parameter description is optional.

5.3. Delete Parameters
By clicking the red button “Delete” behind each parameter in the list, this parameter can be deleted from the database. An alert window for confirmation will pop up before actually deleting it. Once it is deleted, the action is irreversible.

5.4. Link Parameters with Sources
By clicking “Edit Parameters Sources” at the bottom of parameter list, you can link the data sources for each parameter.
The data block of survey answers and statistics for a year can be dragged back and forth from “Use In Map” column and “Not Using” column, so as to assign these data to each parameter. Each parameter can have multiple survey answers and multiple statistic CSV files used in map.

For each parameter, a particular survey answer may or may not include Barrier questions. Color in red means this survey answer had barrier questions for this parameter. Barrier data may come from either survey answers or CSV files, or both. You must make sure there is at least one source of Barrier data for each parameter. If a parameter has no source of Barrier data, the background color of this row will turn into pink, and there will be an alert message under the parameter description.

The Parameter Name and Description can be edited in this page. By checking or unchecking the checkbox in front of a parameter, you indicate the system whether this parameter should be shown in the map or not. The name of the parameters here will also be the ones used in the survey.

By clicking “Reset to Previous Setting”, the parameter source mapping will change back to the most recent saved setting. By clicking “Save Parameter Setting”, the current changes will be saved as the new parameter setting.
6. Projects and Incidents (Events) Management

6.1. View Existing Projects
To view projects or incidents recorded, open the “Projects and Incidents” item on the side menu. Once inside, choose the “Existing P&I” tab and you will see a table with the existing projects. If you want to search projects or incident you can use the dynamic search option incorporated. You can also click the arrow to sort the rows.

### Projects & Incidents Manager

- **What is a Project or an Incident?**
  A project is a sponsored activity that takes place in one or more neighborhoods which may impact the community positively. An incident is an event that may negatively impact the community.

- **Add P&I**

- **Existing P&I**

- **Show 10 entries**

- **Search:**

<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>Description</th>
<th>Type</th>
<th>Neighborhood</th>
<th>Source</th>
<th>Remove</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

No data available in table
Showing 0 to 0 of 0 entries

6.2. Delete Projects
If you want to delete an incident or project, click the X button on the right of each item and confirm. The project will be deleted.

6.3. Add New Projects
Open the “Projects and Incidents” on the side menu on the left. Choose the “Add P&I” tab, and then you can add new Project or Incident in the form provided.
## Projects & Incidents Manager

**What is a Project or an Incident?**
A project is a sponsored activity that takes place in one or more neighborhoods which may impact the community positively. An incident is an event that may negatively impact the community.

<table>
<thead>
<tr>
<th>Add P&amp;I</th>
<th>Existing P&amp;I</th>
</tr>
</thead>
</table>

### Form Fields

**Name:**

**Description:**

**Year:**

**Type:**

**Source:**

Type the address or neighborhood where it takes place:  

e.g. 3240 Centre Ave, Pittsburgh PA 15232

**Project / Incident will be added to:**

Click on validate to get nei
7. Using the Map

7.1. Visualization Features
The heat map can visualize the hope levels at a neighborhood level and also allow zoom in options. The heat map layer can also be updated to show only certain community goal parameters. It can also be switched on and off using the switch icon on the top bar.

On the map, the orange markers show all the 92 neighborhoods in the city of Pittsburgh, Pennsylvania. When clicking each orange marker, an info-window displays the neighborhood’s name and ID in it.

When the heat-map layer is on, the darker blue spots represent the places with the lowest hope levels. Places where there is no data will have a transparent layer.
7.2. Choosing Parameters and Year

By clicking the “Edit Preferences” button on the top, a pop up window will face in. In this window, the user can choose different years for the heat map layer. Also, different parameters can be chosen for the calculation of hope levels. It will also affect the calculation of the historical chart of each neighborhood.

<table>
<thead>
<tr>
<th>Heatmap Preferences</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to use the map?</td>
</tr>
<tr>
<td>Select the year to show on the heatmap:</td>
</tr>
<tr>
<td>2015</td>
</tr>
<tr>
<td>Choose the parameters you wish to include in the Hope calculation:</td>
</tr>
<tr>
<td>Select / Deselect All</td>
</tr>
<tr>
<td>Health Care</td>
</tr>
<tr>
<td>Employment</td>
</tr>
<tr>
<td>Higher Education and Training</td>
</tr>
<tr>
<td>Cost of Living</td>
</tr>
<tr>
<td>Transportation</td>
</tr>
<tr>
<td>Criminal Record Biases</td>
</tr>
</tbody>
</table>

7.3. Viewing Projects and Incidents

When an admin user adds a new project or incident through the administrative panel, there will be a new marker icon on the map. Map markers of social benefit projects can be turned on and off in the pop up window mentioned above. Green markers indicate projects sponsored by Neighborhood Allies. Purple markers are projects sponsored by other institutions. Yellow markers are incidents or negative situations.
7.4. **Analytics: Historical Diagram**

By clicking the “View analytics” button inside each neighborhood marker on the map, there will be a window sliding from the left side. On the top, we have the historical chart of this neighborhood in terms of lack of hope, from the earliest time when survey and statistics data was collected to the latest time. In the public version, the survey data for years 2013 and 2014 are the same as the ones for 2015. However, statistics are different.

Each parameter has a curve color in the chart. There is also an average overall hope curve. The parameters shown in this chart are decided by the choice made in the pop up window mentioned above. By clicking the name of the legend of each parameter, the curve will be hidden or shown for a better visualization.

![Lack of Hope: Historical view in Allegheny Center](image)

7.5. **Analytics: Investment Matrix**

Under the historical hope chart, there is a matrix chart of the selected neighborhood in a particular year. Different years can be chosen. The matrix indicates three dimensions. Vertical axis is the importance perception of each parameter. Horizontal axis is the level of barriers. The area of the bubble represents the existing opportunities of each parameter. The investment area is understood as the top right region, meaning parameters with high importance perception and high level of barriers, but with small area of bubble, which means few existing opportunities.
7.6. Analytics: Table of hope levels

Finally, there is a statistic table of hope levels of this neighborhood. In the column of Hope Level, low means the neighborhood feels hopeless in this parameter, while high means people feel hopeful. It also provides the rank of overall hope level and levels of all parameters among the 92 neighborhoods. Small number, such as 7, 10, indicates the neighborhood feels hopeful.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Importance Perception</th>
<th>Existing Opportunities</th>
<th>Level of Barriers</th>
<th>Hope Level</th>
<th>Hope Rank out of 92</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Care</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>7</td>
</tr>
<tr>
<td>Income</td>
<td>Medium</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>28</td>
</tr>
<tr>
<td>Employment</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
<td>41</td>
</tr>
<tr>
<td>Public Schools Quality</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>Low</td>
<td>57</td>
</tr>
<tr>
<td>Higher Education and Training</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>65</td>
</tr>
<tr>
<td>Small Business Funding</td>
<td>Medium</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>62</td>
</tr>
<tr>
<td>Cost of Living</td>
<td>Medium</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
<td>19</td>
</tr>
</tbody>
</table>
The application is a Web Application built on Java Servlet and JSP using a Model-View-Controller (MVC) architectural pattern as the above figure. There are three directories in the project: WebContent, src, and build. Their roles are as the following table.

<table>
<thead>
<tr>
<th>DIRECTORY</th>
<th>CONTENT</th>
<th>ROLE IN MVC</th>
</tr>
</thead>
<tbody>
<tr>
<td>WebContent</td>
<td>JSP files and web configuration files</td>
<td>View</td>
</tr>
<tr>
<td>src</td>
<td>Source codes of Java files</td>
<td>Controller and Model</td>
</tr>
<tr>
<td>build</td>
<td>Compiled Java class files</td>
<td>Not in MVC</td>
</tr>
</tbody>
</table>

The following is a summary of the functionalities related to their corresponding classes and JSP files.
<table>
<thead>
<tr>
<th>FUNCTIONALITY</th>
<th>CONTROLLER</th>
<th>VIEW</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Online Survey</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display Survey</td>
<td>SurveyCollect.java</td>
<td>survey.jsp</td>
</tr>
<tr>
<td>Delete Survey Answers/</td>
<td>SurveyCollectShow.java</td>
<td>Survey_collection2.jsp</td>
</tr>
<tr>
<td>Show Survey Questions</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Survey Manager</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Create/Edit/Delete Surveys</td>
<td>SurveyEditVersion.java</td>
<td>survey_editor.jsp</td>
</tr>
<tr>
<td>Edit Questions of a Survey</td>
<td>SurveyEdit.java</td>
<td>survey_editor2.jsp</td>
</tr>
<tr>
<td><strong>Parameter Manager</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Add/Delete Parameter</td>
<td>ParameterManage.java</td>
<td>parameter_manager.jsp</td>
</tr>
<tr>
<td>Manage Sources of Parameter</td>
<td>ParameterManageSource.java</td>
<td>parameter_manager_source.jsp</td>
</tr>
<tr>
<td><strong>Event Manager</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Add/Delete/View Event</td>
<td>EventManage.java</td>
<td>event_manager.jsp</td>
</tr>
<tr>
<td><strong>Csv File Manager</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generate CSV template for</td>
<td>CsvGenerate.java</td>
<td>csv_generator.jsp</td>
</tr>
<tr>
<td>downloading</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upload CSV files and check</td>
<td>CsvUpload.java</td>
<td>csv_upload.jsp</td>
</tr>
<tr>
<td>Import CSV data into Database</td>
<td>CsvImport.java</td>
<td>csv_import.jsp</td>
</tr>
<tr>
<td><strong>Dashboard</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Show Administrative Panel</td>
<td>SettingAdmin.java</td>
<td>admin.jsp</td>
</tr>
<tr>
<td>Update Heatmap</td>
<td>HeatMapUpdate.java</td>
<td>admin.jsp</td>
</tr>
<tr>
<td><strong>Hope Map Tool</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Show the initial Heatmap</td>
<td>HeatMapManage.java</td>
<td>map.jsp</td>
</tr>
<tr>
<td>Handle asynchronous request from</td>
<td>ActionServlet.java</td>
<td>map.jsp</td>
</tr>
<tr>
<td>Hope Map Tool</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Account Manager</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allow Employee to Log In</td>
<td>LoginActionEmployee.java</td>
<td>login_employee.jsp</td>
</tr>
<tr>
<td>Allow Employee to Log Out</td>
<td>LogoutAction.java</td>
<td>offline.jsp</td>
</tr>
<tr>
<td>Create New Employee Account</td>
<td>CreateUser.java</td>
<td>create_user.jsp</td>
</tr>
<tr>
<td>Send Email for Account when</td>
<td>ForgetPassword.java</td>
<td>forget_pwd.jsp</td>
</tr>
<tr>
<td>Forgetting Password</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change Password of an Account</td>
<td>ChangePassword.java</td>
<td>change_pwd.jsp</td>
</tr>
</tbody>
</table>

For the Model section in MVC, we use the GenericDAO to access the database. For those queries which are hard to achieve with GenericDAO, there is another model named RawModel which executes SQL queries to achieve the goals efficiently. Please refer this link [http://www.jeffeppinger.com/GenericDAO/](http://www.jeffeppinger.com/GenericDAO/) for further information about GenericDAO.
9. Database Architecture

This application uses MySQL as backend database server. The tables in the database could be roughly categorized into the following:

9.1. Online Survey

The functions of tables in this category are mainly about online surveys. These tables would store surveys, questions of each survey, collected surveys, and the relation of surveys with parameters. Neighborhood Allies could manage surveys and results through logging into the Administrative Panel.
9.2. Imported CSV files
The tables in this category are about those CSV files imported by Neighborhood Allies. One table stores the metadata of files while the other stores the content in the files. Neighborhood Allies could import and view imported files through logging into the Administrative Panel.

9.3. Event
The tables in this category are about those projects that would be shown in Hope Map Tool. Neighborhood Allies could manage events through logging into the Administrative Panel.

9.4. Parameter
The tables in this category are about those parameters, which composed of the formula of Hope. For efficiency, these tables also record the relations of parameters with their data sources. Neighborhood Allies could manage parameters and their relations with sources through logging into the Administrative Panel.

9.5. Hope Map Tool
The tables in this category are all about supporting the public Hope Map Tool like heat map, curves, and table charts. They could be generated by other categories. Since the computation is time-consuming, the tables here act as a role of “cache” to enhance the performance of Hope Map Tool to avoid repeating computation for each request. The tables here would not be changed after adding a new-collected survey or importing another statistics as CSV file. As a result, Hope Map Tool also would not be affected by these actions. When the collected data is ready to show publicly in Hope Map Tool, Neighborhood Allies should click the “Update” button in the Dashboard and then these tables would be updated.

10. Deployment Information
Currently, the application is being hosted at Amazon Web Services (AWS) using an instance Free TIER. The server configuration, billing options of hosting and other server related configuration
options can be managed from the AWS console: http://aws.amazon.com. The username of Neighborhood Allies is shad@neighborhoodallies.org.

The domain www.HopeLivesHere.life is managed by Godaddy.com (a third party domain seller) under username nahope. It is currently pointing to the AWS Neighborhood Allies instance using Amazon’s elastip-ip address. In case it needs to be changed, renewed, or redirected it is necessary to enter the admin panel at GoDaddy.com and in AWS.

Finally, the application is also stored in a private GitHub repository. This is the open source location Neighborhood Allies should share with developers interested in modifying or extending the existing software.

10.1. Hosting and Domain Billing

Currently, the domain HopeLivesHere.life has been registered and paid for one year. Before it expires in August 2016, email notifications will automatically be sent from GoDaddy.com to shad@neighborhoodallies.org. Fortunately, it has been set to auto-renew without the need of changing anything, unless the card information provided changes. To de-activate domain renewal, change billing information or handle the domain DNS (configuration of the name to point to the server in Amazon) you need to login into Neighborhood Allies’ GoDaddy account.

The Amazon hosting does not require any renovation. All billing alerts will be sent to the same email address as well.
10.2. Developing Team Contact

Although the consulting engagement with the developing team has concluded, we will be happy to assist with possible questions that may arise in the future. Our contact information may be found below.

In case of future modifications and implementations, we strongly recommend Neighborhood Allies to provide a copy of this documentation to anyone who will be working with the source code.

<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mengqian Chu</td>
<td><a href="mailto:mengqianchu27@gmail.com">mengqianchu27@gmail.com</a></td>
</tr>
<tr>
<td>Camilo Cruz</td>
<td><a href="mailto:camilocruz87@gmail.com">camilocruz87@gmail.com</a></td>
</tr>
<tr>
<td>Iris Li</td>
<td><a href="mailto:irislsythy@gmail.com">irislsythy@gmail.com</a></td>
</tr>
<tr>
<td>Joven Mou</td>
<td><a href="mailto:jovenmou@gmail.com">jovenmou@gmail.com</a></td>
</tr>
<tr>
<td>Jui-Pin Wang</td>
<td><a href="mailto:r790822@gmail.com">r790822@gmail.com</a></td>
</tr>
<tr>
<td>Jing Zhuang</td>
<td><a href="mailto:zhuangjing92@gmail.com">zhuangjing92@gmail.com</a></td>
</tr>
</tbody>
</table>