

Data Visualization

HealthCare Application

New Bee

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Introduction

- **Purpose of the application**
 - Information visualization
 - Trend in diabetes
 - Predictive analysis
 - Correlate trends in diabetes
- **Project Accomplishments**
 - Comprehended data set
 - Data clean-up
 - Suitable visualizations.

Introduction

- **Users**

- Doctors
- Analytical people
- Common man

- **Data related work**

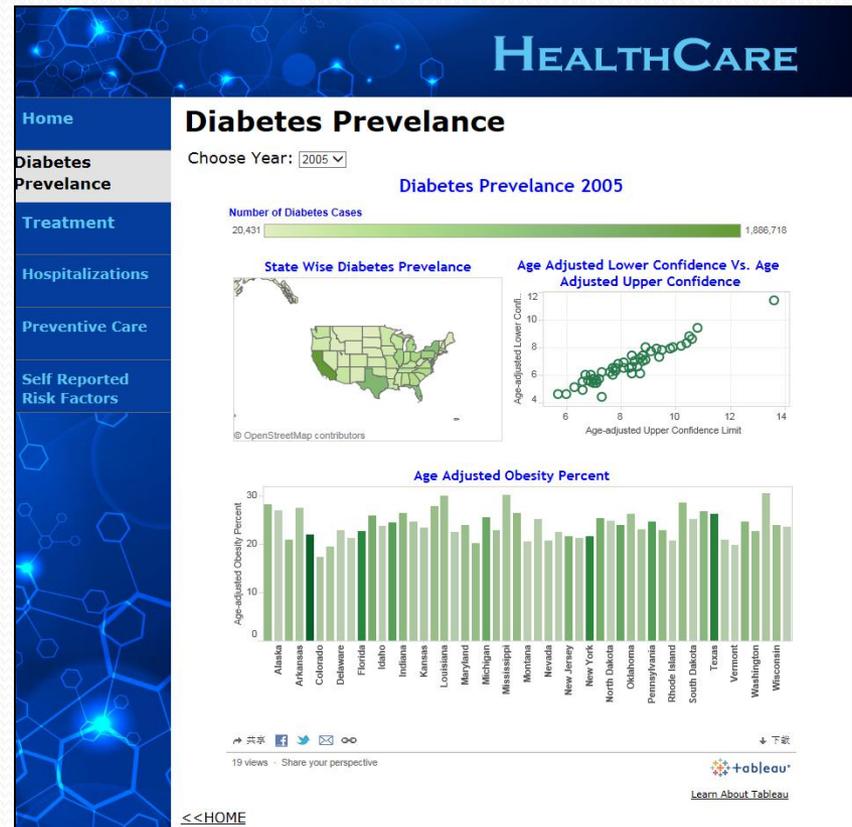
- Obtained from Centers for **Disease Control and Prevention (CDC)**
- Diabetes patients
- Multiple years data
- Across all states of the US



<http://www.cdc.gov/>

Introduction

- Tools used
 - HTML and JavaScript
 - Apache Tomcat Server
 - NetBeans IDE 8.0.1
 - Dreamweaver CS8
 - Tableau



Outlines in visualization

- **Diabetes Prevalence**

- shows the relationship among number of people diagnosed as diabetic, their adjusted ages and corresponding obesity percentage, within each geographic location for several years.

- **Hospitalization**

- shows the comparison of the number of discharges and the length of stay in the hospital for people diagnosed diabetic, as a first listed diagnosis or any listed diagnosis, across several years.

Outlines in visualization

- **Treatment**

- Shows the percentage of adults within diabetes by diabetes medication status, across several years.

- **Self Reported Risk Factor**

- Shows trend pertaining to risk factors in diabetic patients.

- **Preventive Care**

- Suggests the trend in people (as percentage) who took different preventive actions, and were also diagnosed diabetic.

Data Visualization

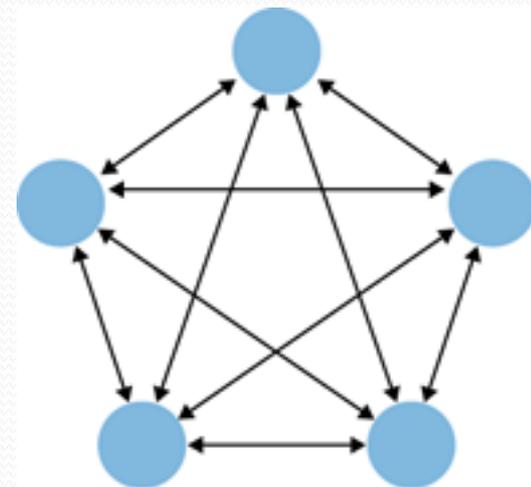
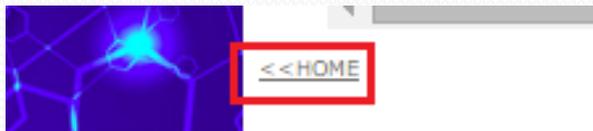
- **Design pattern**

- **Organization: Multiple workspaces**

Users may want to view different graphs and trends in the application.

- **Navigation: Fully connected**

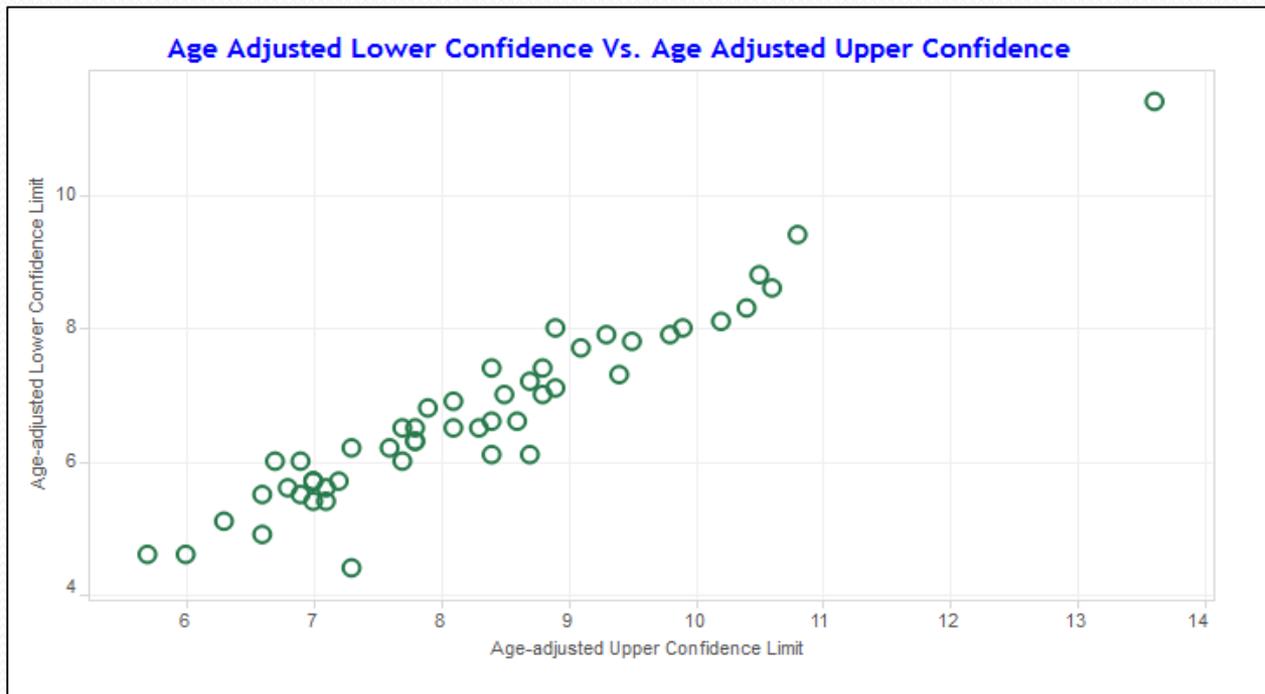
Allows the users to navigate between pages and also return to the home page from each page.



Data Visualization

Design Principles

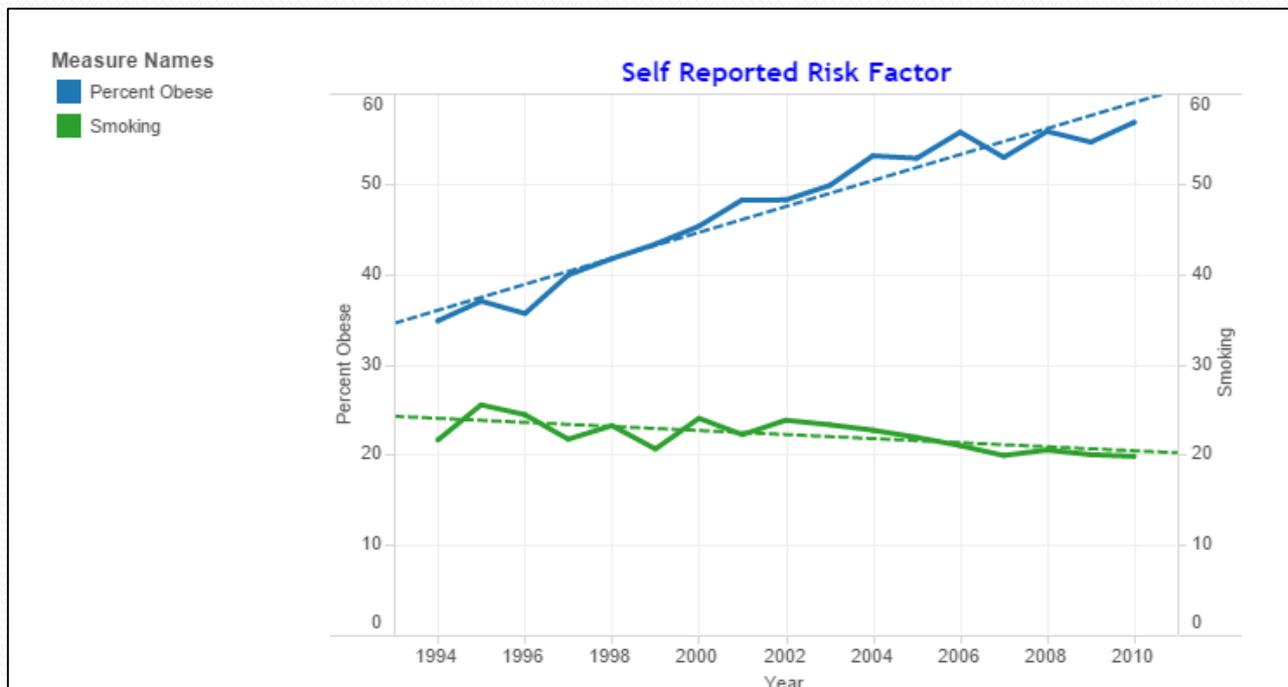
- Scatter plot 



Data Visualization

Design Principles

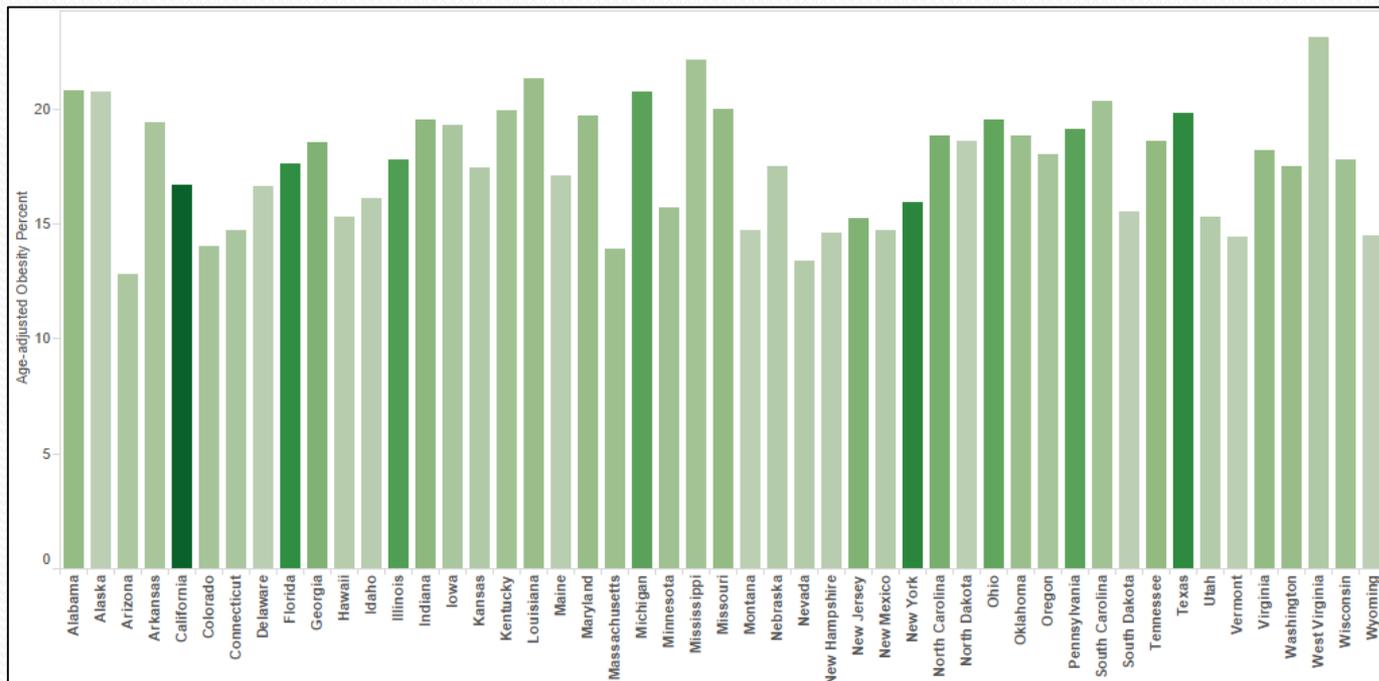
- Line graph (Trend Lines +) 



Data Visualization

Design Principles

- Bar chart 



Data Visualization

Design Principles

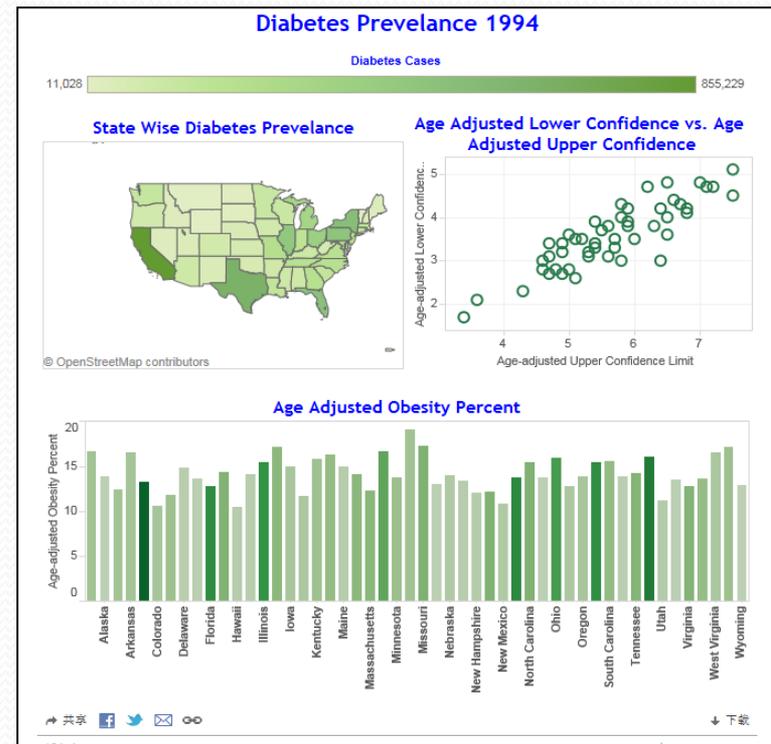
- US map 



Web Application

- **Dashboard** 
- Shneiderman's Mantra
- Overall structure
- Details
- **Note!**

not refreshed on a daily basis,
as a typical dashboard is
intended to do.



Analytical Interactions

- **Comparison**

- An effective data analysis is to allow comparisons.
- The dataset chosen for this project had data for different years and comparison of data among years and state was thought suitable.

- **Sorting**

- The visualization graphs are allowed to be sorted to analyze the same data in different perspectives.

Analytical Interactions

- **Filtering**

- The filtering option is provided for users to choose specific years of data.
- Users can choose year and obtain data and trend corresponding to that year.

- **Highlighting**

- Brushing – Highlight the same data in multiple graphs
- Data Spot light – Highlight selected and dim the rest

Analytical Interactions

- **Zooming and Panning**

- In the overall display of dashboards, the map is displayed as a small object.
- If the user wants to zoom to look for states in the east coast, the user would be able to do that by zooming and panning across the maps.

- **Data Tips**

- Users can get more information by hovering over the mouse.
- A tool tip with more information regarding the data will be displayed to the user.
- This feature would aid the user to understand and analyze more data and to further drill down to the atomic level.

Setup and Run

- I. Unzip original project zip file
- II. Open NetBeans IDE, click “File” in tool bar and open original project folder.
- III. If there is a warning of “Missing Java EE Server” under “Libraries”, right click on project “HealthCare” and click “Resolve Missing Server Problem” to configure a server which is indispensable to support tableau API.
- IV. Right click on project “HealthCare” and click “Run” to run this web application on local server.

DEMO

- **Web Application: HealthCare**



References

- [1] <http://www.tableausoftware.com/new-features/javascript-api>, Accessed on Nov 30, 2014.
- [2] <http://www.tableausoftware.com/public/>, Accessed on Nov 15, 2014.
- [3] <http://www.cdc.gov/diabetes/data/national.html>, Accessed on Nov 15, 2014.
- [4] Ben Shneiderman, The Eyes Have It: A Task by Data Type Taxonomy for Information Visualizations. In Proceedings of the IEEE Symposium on Visual Languages, pages 336-343, Washington. IEEE Computer Society Press, 1996.
<http://citeseer.ist.psu.edu/409647.html>