CHOROBESITY

MODERN INSIGHT TO AN ENDURING EPIDEMIC

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Introduction

- **Problem:**
  - Our client wants to utilize a *geographical representation tool* to do further research into prevalent health conditions:
    - Obesity
    - Diabetes

- **Questions:**
  - Is there a *geographical correlation* between obesity and diabetes?
  - How do we show this correlation?
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<th>STAGE</th>
<th>TASK</th>
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<td>01</td>
<td>Conceptualize and finalize the project's requirements (September 15)</td>
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<td>02</td>
<td>Establish a management framework (September 29)</td>
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<td>03</td>
<td>Development: Front-end, Back-end, Initial Testing (October 3)</td>
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<td>04</td>
<td>Final touches, thorough testing, and creation of User Manual (November 10)</td>
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<td>05</td>
<td>Complete report and launch project (November 14)</td>
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Application Development: Architecture
Application Development: Color-Coded Map

- **Color Key:** the “key” to the map display
  - Obesity Scale (red)
  - Diabetes Scale (blue)
  - Bivariate Scale (both health conditions)

- **Integration of the Key with the Data**
  - Normalization of data
  - Calculate mean and standard deviation
  - Create ranges for which data points will fall
  - Associate data with a color on the map

```
"#e6e2e2", 
"#a0b3d3", 
"#5c85c5"], 
"#d6a1a2", 
"#967f97", 
"#565f8d"], 
"#c6b5d", 
"#8b4857", 
"#503651"],
```

**Lessons Learned:** Color Key in Front-End vs Back-End
Application Development: Data Management

Data Acquisition: Initial

- Find a comprehensive dataset
  - County Health Rankings

- Select data points that were relevant to the scope of the project:
  - County names
  - Obesity Percentage
  - Diabetes Percentage
  - Population

- Creation of our own, relevant Excel document for initial data points and testing

Data Processing: Final

- Translate Excel data into JSON format directly from source

- The JSON file is the bedrock to implementing the choropleth map on the front-end

- Stores calculations needed to display a corresponding color on the front-end map

Challenges: Data Consistency, Data Validation, Integration with Visualization Tools.
APPLICATION FEATURES

Interactivity

Mouse Hover Feature:
• State/County health data
• Clicking on Legend colors to view ranges

Interactive State and Color Key Filter

View Options:
• National: 50 states
• Single-state: county outlines

Color Key Options:
• Obesity
• Diabetes
• Bivariate

Data Representation

Legend Features:
• Choropleth Key
• Width Factor
• Range Display

View Options:

Color Key Options:

Virginia
Avg. County Obesity Affliction: 32%
Avg. County Diabetes Affliction: 9%

Prince William
Population: 484,472
Obesity Affliction: 34%
Diabetes Affliction: 16%
DEMO
OF THE APPLICATION
Initial Objectives:
• Choropleth map of Virginia + counties [met]
• Mouse hover with further information [met]
• Identify initial dataset(s) [met]

Extended Achievements:
• Choropleth map for the entire United States
• Choose between different scopes to view data
• Choose between different choropleth keys

Technical Accomplishments:
• Integration of comprehensive datasets into a user-friendly platform
• Utilization of cutting-edge web technologies for real-time data visualization and responsiveness

Provided a valuable tool for stakeholders in healthcare and policy to visualize and analyze regional health trends.
**Containerization:**
- Build and bundle the application to run anywhere

**Mobile Integration**
- Implement the application to be adaptable on all devices

**File Upload (Front-End Support)**
- Finish the necessary front-end infrastructure for users to upload files to the application
Dr. Lynn Abbott is a professor at Virginia Tech and is the sponsoring client of the Chorobesity project. He received his B.S. at Rutgers University before earning his M.S. at Stanford and finally his Ph.D in Computer Vision and Electrical Engineering.

His research interests lie in his field of doctoral studies, as well as in biometrics and autonomous vehicle systems. His publications in this work have received over 3,000 citations.

Chenyu Mao, currently pursuing his Master's in Computer Science and Applications at Virginia Tech, previously earned his Bachelor's degree from the same institution.

He is a sponsoring client of the Chorobesity project. He has contributed significantly by providing a visual depiction of the anticipated outcome. This visual guide has served to unify the team's direction, ensuring all members are aligned with the intended objectives.
REFERENCES


Questions?