VCU BIOMEDICAL VISUALIZATION

The Backlog Boys (and Girls (of CIT))

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“Create a program that allows a user to see the correlations and relations between medical terms.”




Medical Professionals

connections between symptoms and diseases as well as diseases and cures

Medical Students

comprehensive structure in order to learn more about the relationships between medical drugs, diseases, and symptoms

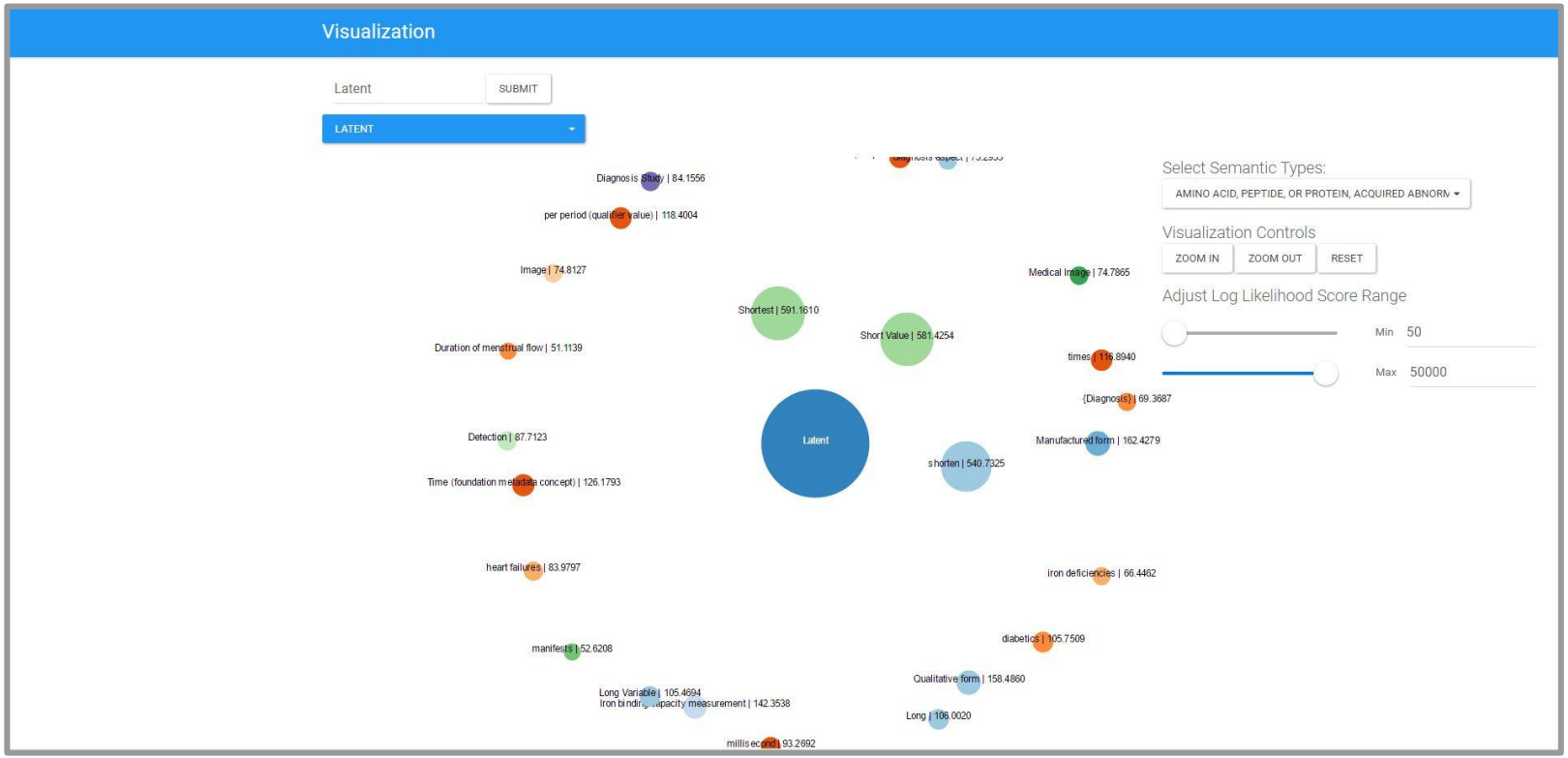
Lab Researchers

complicated visualization in order to identify relationships in order to develop future programs to sample from the data

People with Limited Medical Knowledge

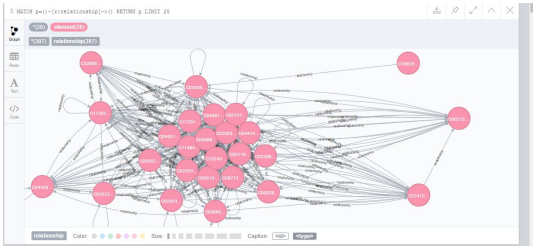
comprehensive and easy-to-understand database in order to read up on the medical issue pressing to situation

The Website


Visualization
Latent
SUBMIT
LATENT
Diagnosis Study | 84.1556
per period (qualifier value) | 118.4004
Image | 74.8127
Medical Image | 74.7865
Shortest | 591.1610
Short Value | 581.4254
Duration of menstrual flow | 51.1139
times | 116.8940
{Diagnosis} | 69.3687
Detection | 87.7123
Latent
Manufactured form | 162.4279
shorten | 540.7325
Time (foundation metadata concept) | 126.1793
heart failures | 83.9797
iron deficiencies | 66.4462
diabetics | 105.7509
manifests | 52.6208
Qualitative form | 158.4860
Long Variable | 105.4694
Iron binding capacity measurement | 142.3538
Long | 106.0020
millisecond | 93.2692
Select Semantic Types:
AMINO ACID, PEPTIDE, OR PROTEIN, ACQUIRED ABNORM
Visualization Controls
ZOOM IN
ZOOM OUT
RESET
Adjust Log Likelihood Score Range
Min 50
Max 50000

Development Strategies

- The data was originally formatted as TAB SEPARATED VALUES
- Because each data record consists of words connected to other words with a similarity score, we reformatted the data into a graph database consisting of nodes and relationships.
- This made it simple to obtain all of a given word's **relationships**.



Auto-Generated Visualization
(25 Terms)

Application

Search for **closest words** using...

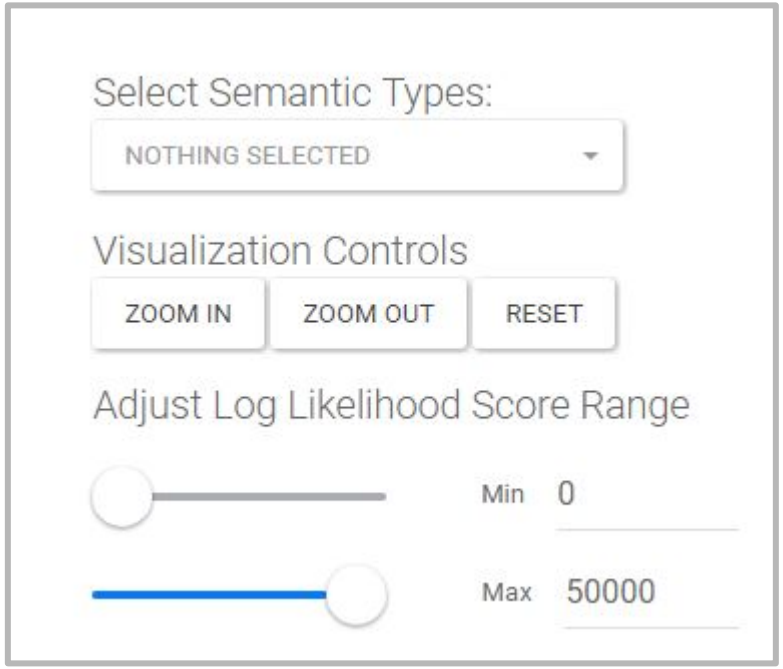
- Levenshtein distance metric

Display **relationships**...

- Of range of likelihood scores
- Between certain selected semantic types

Pan and zoom functions allow users to...

- Move the SVG graphics
- Zoom in on relationships



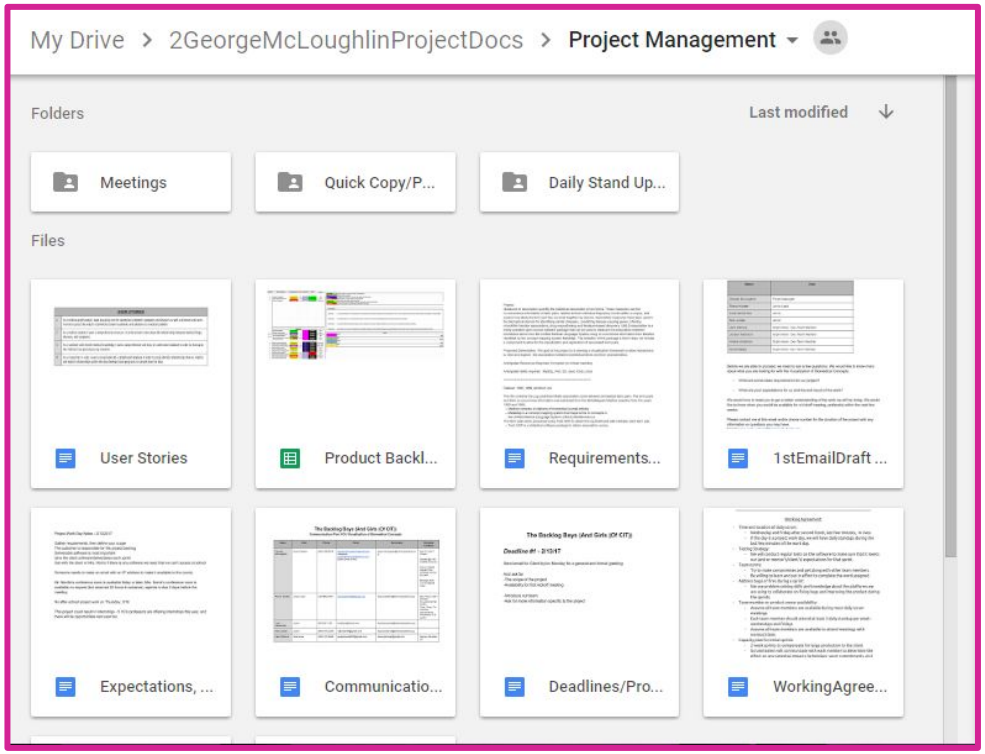
Mentorship Program

Client: Dr. Bridget McInnes

Expert in NLP, Professor at VCU

Knowledge in **Computer Science**

Our Approach



Team Documentation Folder, Google Drive

Scrum Project Management

Three main activities: *Creation of Program, Documentation, Presentation*

Split the product into increments

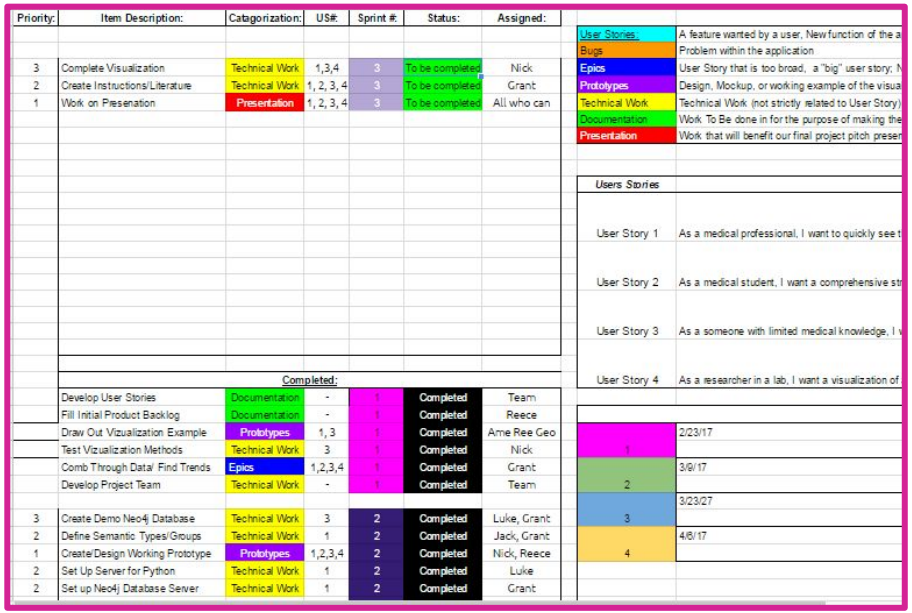
SCRUM Project Management Technique Cont.

Sprints: *2 weeks*

Followed by a Client Meeting

Techniques:

- *Daily Standups*
- *Self-Assigning Team*
- *Utilized Product Backlog & Sprint Backlog*



Priority:	Item Description:	Catagorization:	US#:	Sprint #:	Status:	Assigned:
3	Complete Visualization	Technical Work	1,3,4	3	To be completed	Nick
2	Create Instructions/Literature	Technical Work	1, 2, 3, 4	3	To be completed	Grant
1	Work on Presenation	Presentation	1, 2, 3, 4	3	To be completed	All who can
	Completed:					
	Develop User Stories	Documentation	-	1	Completed	Team
	Fill Initial Product Backlog	Documentation	-	1	Completed	Reece
	Draw Out Vizualization Example	Prototypes	1, 3	1	Completed	Ame Ree Geo
	Test Vizualization Methods	Technical Work	3	1	Completed	Nick
	Comb Through Data/ Find Trends	Epics	1,2,3,4	1	Completed	Grant
	Develop Project Team	Technical Work	-	1	Completed	Team
3	Create Demo Neo4j Database	Technical Work	3	2	Completed	Luke, Grant
2	Define Semantic Types/Groups	Technical Work	1	2	Completed	Jack, Grant
1	Create/Design Working Prototype	Prototypes	1,2,3,4	2	Completed	Nick, Reece
2	Set Up Server for Python	Technical Work	1	2	Completed	Luke
2	Set up Neo4j Database Server	Technical Work	1	2	Completed	Grant

User Stories:	A feature wanted by a user, New function of the a
Bugs	Problem within the application
Epics	User Story that is too broad, a "big" user story; N
Prototypes	Design, Mockup, or working example of the visua
Technical Work	Technical Work (not strictly related to User Story)
Documentation	Work To Be done in for the purpose of making the
Presentation	Work that will benefit our final project pitch presen

Users Stories	
User Story 1	As a medical professional, I want to quickly see t
User Story 2	As a medical student, I want a comprehensive st
User Story 3	As a someone with limited medical knowledge, I v
User Story 4	As a researcher in a lab, I want a visualization of

1	2/23/17
2	3/9/17
3	3/23/27
4	4/6/17

Product Backlog

Lessons Learned

Start	Stop	Continue...
• Holding Daily Scrum or other types of Group Meetings daily instead of two days per week.	• Not Anticipating Spring Break, taking that time out of schedule	• Holding Daily Scrum meetings to decide on weekly jobs.
• Recording a log of bugs and glitches we experienced to aid future development processes.	• Strict Daily Documentation; it slowed down the development process	• Planning and preparing for client meetings at least one week in advance
• Developing a group collaborative calendar for upcoming dates.	• Scope of the Terms was initially too large as too many types slowed the creation process.	• Utilizing a Group Chat to keep on track with communication

Questions?

Live Demo

Images:

https://www.usnews.com/dims4/USNEWS/373095b/2147483647/thumbnail/970x647/quality/85/?url=%2Fcmsmedia%2Fe7%2F44%2Fa6e8ea674cb9af4dde5fd7d5a845%2F140903edufirstyearofmedicine-editorial.jpg

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