

# **IPRO 311: Integrating the United States Holocaust Memorial Museum website with The IIT Intranet Mediator**

## **Final Report**

### **Background**

The USHMM has spent the past ten years collecting information about the Holocaust. They have vast amounts of information in several different formats such as encyclopedia articles, census bureau data, and written accounts from holocaust survivors themselves. The USHMM is in dire need of a way to efficiently and effectively search, sort, and distribute this information to all that seek to learn from it.

The Intranet Mediator is a ground-breaking search engine that uses innovative new technology to process natural language queries and return relevant answers using multiple sources. The Mediator is capable of handling structured, semi-structured, and unstructured data to provide the information the user has requested. To make the mediator able to support a variety of queries, rules need to be written. Rules are guidelines for the different queries to be mapped to retrieval function. Retrieval functions actually interact with the sources to return the relevant results.

The Mediator is the ideal solution to the problem that the USHMM has encountered. It will provide the perfect means to efficiently search the vast amount of information the USHMM has labored so hard to collect.

### **Purpose**

The Intranet Mediator was developed by previous members of IPRO 311 along with the IIT IR lab. Until this semester the Mediator was held together by “chewing gum” and fell apart every fifteen seconds. It was our ultimate goal to tear down the Mediator and completely rebuild it. We did this to stabilize and increase efficiency of the Mediator. To create an efficient, functional new Mediator we wanted to accomplish the following goals:

- Convert rules to fit the new Mediator format
- Add additional rules and data sources to the Mediator
- Create an intuitive, yet simple user interface
- Improve and ensure the quality of the Mediator by
  - Adding a spell corrector
  - Stress test the Mediator
  - Document all processes

### **Team Members**

- Tristan Slougher; CS
- John Quigley; CS
- Kevin Harriss; CS
- Jonathan Young; BME
- Nicholas Lee; EE
- Evan Farrar; CS
- Dale Player; EE

## **Group Progress**

The group as a whole has progressed not only in quantitative work based standards, but in teamwork and camaraderie aspects as well. In addition to the weekly meetings, all available avenues of communication have been used to keep the group working at its maximum potential; weekly AIM conversations, online postings on our group bulletin board, phone calls, and additional personal meeting times. The group has done an excellent job thus far overseeing the work of each team member, by thoroughly discussing the weekly accomplishments.

In order to foster a professional relationship with our sponsor, The Intranet Mediator Inc., we have met with several of the executives of the corporation. These executive include Larry Kane (CEO), Jay Fischer (CFO), David Grossman (CIO), and we have Jeff Heard (CTO), regularly come to our meetings to instruct and advise us on how to better accomplish the task of creating the Mediator.

## **Assignments**

### Coding Team– John Quigley, Tristan Sloughter

The focus of the coding team was to maintain the Mediator engine and make adjustments to provide quality assurance. This group had to address all major problems and seek alternative solutions to make the program more effective. This group oversaw the installation of the mediator and created WebPages using a new interface to execute the natural language queries.

The coding team wrote the code to integrate the website with the mediator, and the mediator with its sources. The coding team has written functions in order to search the database by date and location. These pieces of code enable the Mediator to act on natural language queries. They have also added a spell corrector that checks for misspellings and similar results. The group has also been writing query modules to contain the rules.

Finally, the coding team was responsible for documenting the entire process. The documentation explains parts of the IPRO and Mediator, with several sections explaining the different parts of the search process and what their functions are. All of the query modules are also explained in detail, including examples of the databases they search and represent.

### Data Integration Team – Kevin Harriss, Jonathan Young, Nicholas Lee

The focus of the data integration team was to develop the Mediator and to integrate the USHMM website with the mediator, and its sources. The group created questions in order to identify query types, analyzed USHMM queries, created new query types, and wrote rule formats for the query types. This group has successfully identified several query types and written numerous rule formats. The data integration team successfully converted over 250 rules from the old Mediator format to the new format. They have also created 100 new rule functions for the query types and sample questions in an attempt to account for all of the questions present in the retrieval functions.

## Deliverables Team – Dale Player, Evan Farrar

The deliverables group had a wide range of responsibilities. This group created an IPRO 311 website which explains all Mediator related information and progress. Creating posters, brochures, and slide show presentations was an important assignment given to this group. Administrative duties which are crucial to a smooth running project were also a responsibility of this group. Along with these responsibilities the members of the deliverables team were assigned to assist the members of other groups, especially the integration group with writing questions and creating rules.

### **Obstacles and Barriers**

There have only been a few obstacles thus far in the project and fortunately we have been able to overcome them rather quickly. We ran into the problem that not everybody had the programming skills needed to contribute to writing the rules. Thanks to good team work, the more skilled team members met individually with the other members and gave them lessons on how to write the rules. This has increased the effectiveness and amount of work that each member can contribute to the project.

Two weeks before the completion of the IPRO semester there was a system outage at IIT which affected the server the Mediator was housed in. This resulted in problems with the Mediator which put it out of commission for several crucial days. With the ingenious skills of our coding team, we were able to get the Mediator back up and running so everyone could finish their assignments.

There was also an ethical issue that we had to deal with. A certain type of software was needed to complete part of our project. We did not have a license for this software and unanimously decided that we needed to purchase one, which we did and all has been resolved.

### **Results**

After over 1200 hours of work done by the entire team, the Intranet Mediator is an efficient, functional search engine. We were able to accomplish all of the goals we set out for in the beginning of the semester and we are very pleased with the results.

This semester the Mediator was demonstrated to senior executives of the USHMM. They were thrilled with the possibilities it provided. The Deputy Chief Technical Officer stated the Mediator was his “dream search engine.”

### **Recommendations**

Although we have excelled in creating a new functional Mediator, there is still more that could be added to make the Mediator even more powerful. We suggest that future IPRO 311 teams further enhance the quality of the Mediator by adding functions that allow the Mediator to process multi-language queries and add a grammatical corrector. As the amount of information gathered by the USHMM grows, the group will have to add new data sources and query modules also.

## **Acknowledgements**

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