**Discussions & Hints**

This document provides overall discussions made within the team in order to make design decisions and choose technologies to be used in the project. The project involves big data operations, web application development and data visualization techniques. Also, the requirements include accessibility and usability. Therefore, all the decisions are to be made carefully in order to provide a maintainable system.

The first major discussion was about the choice of database.We had done extensive research on using any indexing services such as lucene to serve the back-end. Since the data was highly structured, we decided to use a SQL database. We chose MySQL as the database. Though MySQL database do not have any restrictions on the amount of data it can handle, we ran into some serious performance issues during the development period. Several optimizations techniques were employed. Since scalability was not the primary focus of this project, we did not invest a lot of time in performance improvement. We suggest the next team to focus on improving the back end which would significantly improve the overall quality of the system

The second major focus was to chose the technology for visualizations. We started development using JUNG framework. JUNG was already being used in the project and could be integrated easily with java. However, we realized that applets were needed to support JUNG for an accessible system. Because, applets are not a good choice for a usable system especially when it is about massive visualization. After consulting and confirming with our advisor, we came up with D3 javascript library to render our diagrams on the UI.

The last but not least major discussion was about the framework that we need for the application. We had chosen JSF initially in order to utilize applets in the system. However, after additional research and help from our advisor (also thanks to Hao, her PhD student), we decided to use the Play framework. Data can be served in a RESTful manner to the application. This let us isolate the frontend application from the backend.