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Database Systems

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Lab 1: PostgreSQL

1. Data vs. Information: Data, in short, is unorganized information. Data can be gathered from almost any type of action, event, or operation. One example we can use to start to compare data to information is Major League Baseball. Baseball is a numbers game, and this means that every single statistic from every single game is recorded in a database. Simply recording the data is not enough to use the data meaningfully. Data needs the assistance from a computer program or application to transform it into usable information. In our example, the specific data from a baseball game is recorded into the database, but then is organized into a more usable form. The data is organized into a way that gives the data meaning. With this, analysts or fans can use the information to make decisions about their fantasy teams, or make predictions about upcoming games. Data, by itself, cannot tell us much with regards to making future decisions. What it can do, is provide us a base on which we can manipulate the data in order to form information. It takes bright minds to use this information to make the proper decision, but the information gives those people the opportunity to.

2. Data Models: The Hierarchical model is a data model that organizes the data into a tree-like structure. Created by IBM, IMS is a hierarchical data model that has physical data independence. This means that the data looks the same on different operating systems. Other data models like the flat file system lack data independence, meaning that any changes in the model or other systems need specific programming. The problem with a hierarchical model is that, like

our example in class, may not address all specific fields that need to be addressed. For example, item 4 in our MMORPG example was not held by any player. This means that there was no vector connecting a player to an item, and this means that the item simply did not exist. What needed to be done was to add a vector from the adventure game directly to the item. This caused problems for programmers who wanted to find out how many players were currently playing or how many players had stopped playing. Instead of counting all vectors from the adventure game to the players, they now could not because they had another vector going directly to a game item. This is one type of problem that lead to the development of the relational database.

The network model is essentially a hierarchal model with closed paths. In our example, if two players owned the same item, then each player would have their own vector to their specific item. The network model would eliminate the specific vector, and have two vectors from two players pointing to the same item. One shortcoming of the network database model is the complexity that it creates. There are now several vectors crossing paths, and it makes navigating the database very difficult. These shortcomings were in part, conditions that lead to the development of the relational database that we know today.