## 2.3 Design strategies of Distributed Databases

There are two approaches for developing any database, the top-down method and the bottom-up method. While these approaches appear radically different, they share the common goal of uniting a system by describing all of the interaction between the processes.

2.3.1 Top – down design method

The top-down design method starts from the general and moves to the specific. In other words, you start with a general idea of what is needed for the system and then work your way down to the more specific details of how the system will interact. This process involves the identification of different entity types and the definition of each entity's attributes.
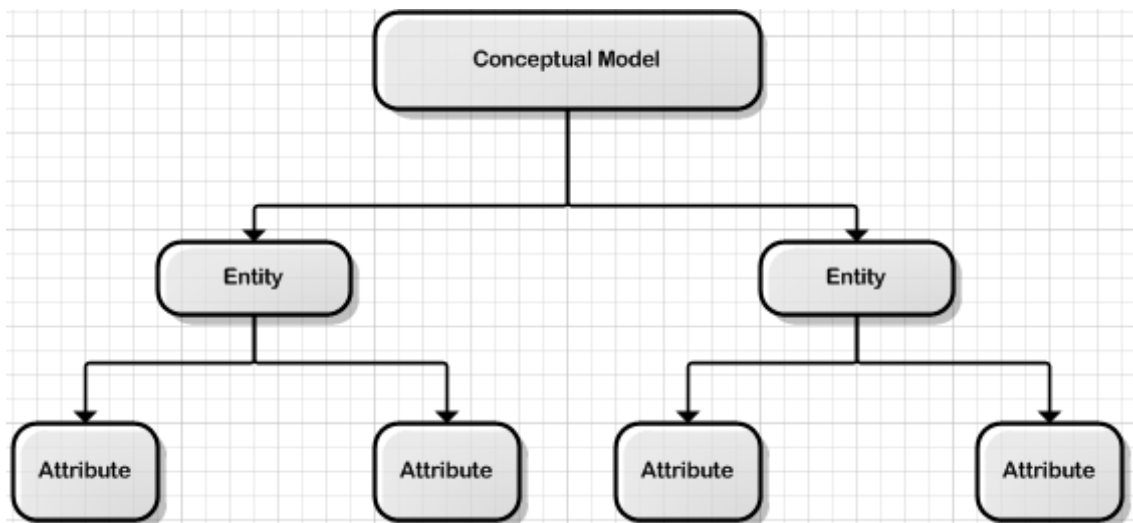

2.3.2 Bottom – up design method

The bottom-up approach begins with the specific details and moves up to the general. This is done by first identifying the data elements (items) and then grouping them together in data sets. In other words, this method first identifies the attributes, and then groups them to form entities.
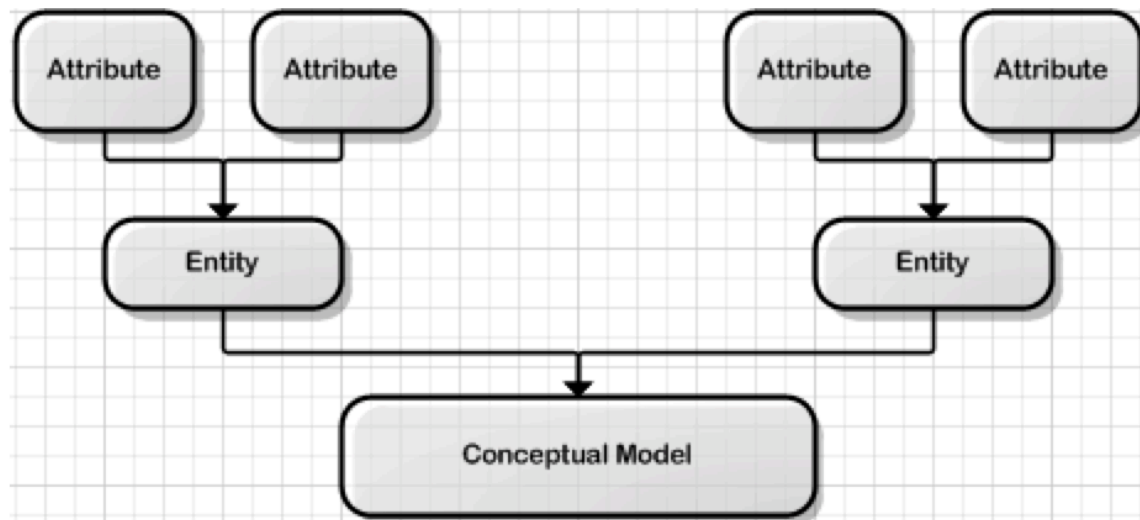
Two general approaches (top – down and bottom – up) to the design of the databases can be heavily influenced by factors like scope, size of the system, the organizations management style, and the organizations structure. Depending on such factors, the design of the database might use two very different approaches, centralized design and decentralized design.

2.3.3 Centralized design

Centralized design is most productive when the data component is composed of a moderately small number of objects and procedures. The design can be carried out and represented in a somewhat simple database. Centralized design is typical of a simple or small database and can be successfully done by a single database administrator or by a small design team. This person or team will define the problems, create the conceptual design, verify the conceptual design with the user views, and define system processes and data constraints to ensure that the design complies with the organizations goals. That being said, the centralized design is not limited to small companies. Even large companies can operate within the simple database environment.
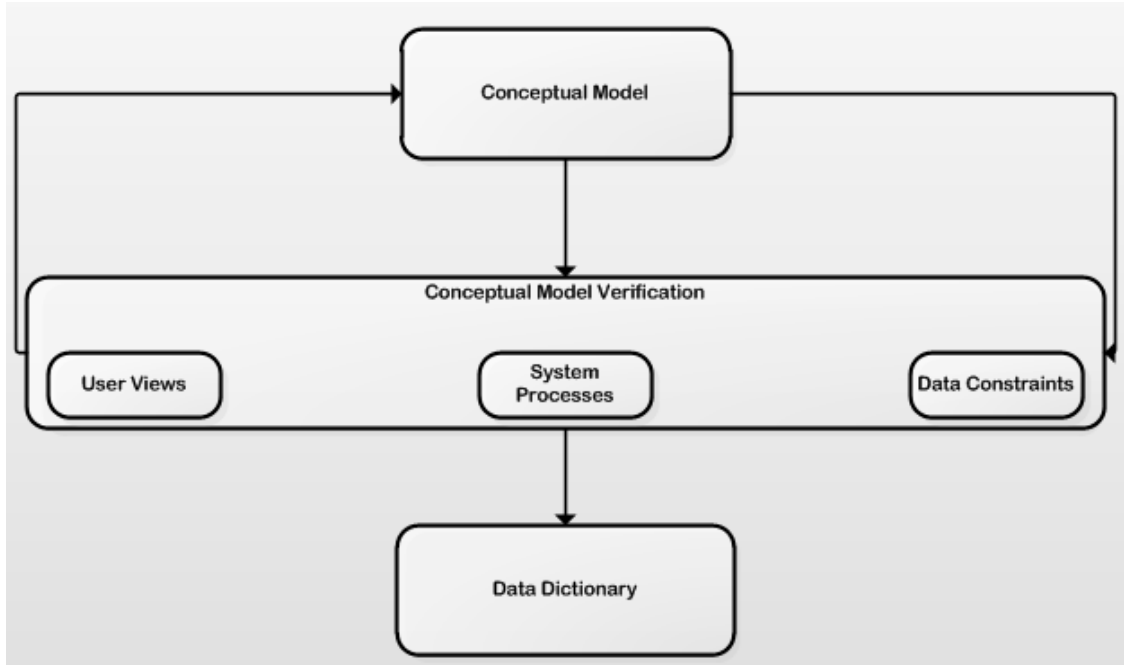
2.3.4 Decentralized design

Decentralized design might best be used when the data component of the system has a large number of entities and complex relations upon which complex operations are performed. This is also likely to be used when the problem itself is spread across many operational sites and the elements are a subset of the entire data set. In large and complex projects a team of carefully selected designers are employed to get the job done. This is commonly accomplished by several teams that work on different subsets or modules of the system. Conceptual models are created by these teams and compared to the user views, processes, and constraints for each module. Once all the teams have completed their modules they are all put aggregated into one large conceptual model.

Submodule Critera

Data Component

Conceptual Model

Engineering   Purchaseing   Manufacturing

Verification

Views Processes Constraints   Views Processes Constraints   Views Processes Constraints

Aggregation

Conceptual Model

Data Dictionary