O’Neil et al. combine well-known techniques for indexing joins between tables to create a method that can efficiently perform common multi-table joins through bitmap indices. In their paper, they focus mainly on star-joins, but their method can also be applied to other types of joins. A star-join is a join between a fact table and multiple dimension tables.

They review some of the techniques used for performing join operations between tables. These techniques can also be generalized from two tables to multiple tables.

The join index is a representation of a pre-computed join between two tables. This representation often associates column values with rows of tables that are being joined. Join indices can be represented as B-Trees, or hash indices, and can be organized in any of the following ways:

By using a look up on the join column value that lists record identifiers (RIDs) of rows in both tables that join with that value.

By using a lookup on RID for each row one table giving a list of RIDs of a second table for rows that join with the first row.

By using a lookup on a non-join column value of one table giving a list of RIDs of a second table for rows that join with the rows in the first table with that column value;

or by using variations of these 3 organizations; for example single column values can be extended to multi-column values.

As mentioned earlier join indices may be generalized from two tables to multiple tables. When an index associates an attribute’s values with all columns of tables where it occurs, it is then called a Domain index.