Chapter 5
Relationship Matrices

ABSTRACT

In this chapter the author considers a single, formerly quite popular design technique: relationship matrices. In the framework of briefing, these matrices allow one to make explicit the strength of relationships between pairs of activities so as to identify clusters of closely linked activities or activities that are central to the brief with respect to a particular relationship. This information can also be expressed as a graph, with the activities as vertices and their relationships as edges – as in Chapter 4.

THE MATRIX

Also known as proximity table and interaction matrix, the relationship matrix used to be one of the crown jewels of computer-aided architectural design (CAAD) long before CAAD became synonymous with drawing, modeling, and visualization. It was considered “one of the most useful aids that has emerged in the search for systematic design methods” (Gregory, 1966). Consequently, both proponents of such design methods (Jones, 1970) and pioneers of CAAD (Mitchell, 1977) paid attention to its use in early design, often as a critical first step in transforming requirements into a schematic layout.

The intention behind the relationship matrix is quite simple and fundamental: to make explicit how strong the relationship between each pair of activities is and use the results to specify the brief as an adjacency of access graph (Chapter 4). To do this, you can make a table (in a spreadsheet or DBMS) and place each activity in a row as well as in a column. In each cell you enter a value that indicates the strength of the relationship, for ex-
ample, 9 for strong, 3 for medium and 1 for weak (Marmaras & Nathanael, 2006). The total of these values indicates the strength of the relationship between each activity and the rest. As a result, the matrix does two main things: Firstly, it provides an overview of the relationships that are so strong as to be considered essential requirements and, secondly, it identifies the activities that occupy a central position in the brief (the ones with the highest totals) (Table 1).

In many approaches, the relationship between a pair of activities is assumed to be symmetric: The relationship between A and B is considered to be the same as between B and A (e.g., any trip between them is a return trip). It follows that the relationship matrix can be drawn triangularly (Table 2). Triangular versions can reduce redundancy and make matrices clearer to read, but they also make totals harder to read and calculate: You have to add up both the column and row of each activity to obtain a total (Figure 1).

The main limitation of relationship matrices is their size and complexity. A matrix of a couple of hundred of activities offers little overview and involves many trivial relationships. An evaluation of the strength of the relationship between the secretariat of a group and an arbitrary office of another group tends to reveal little if anything of interest. A matrix of relationships between groups, within a group or between critical activities of several groups can be more fruitful and interesting. It is therefore advisable to keep relationship matrices relatively compact, focused and certainly meaningful.

### THE GRAPH

By itself the relationship table is useful as a detailed overview but transforming it into a planar graph further enhances its readability. To draw the graph of a table you place the activities as vertices,