Rules for Creating Data Flow Diagrams

1. Each diagram must be on a separate 8 x 11" sheet of paper.

2. The only diagram which may have one bubble is the Context Diagram. All other diagrams must have at least two bubbles. (5 to 9 is best).

3. All vectors must be labelled. Only exceptions are vectors between a bubble and a data store. If these are not labelled, an entire record is assumed to be moving between the two objects.

4. Bubbles on Diagram Zero must be numbered from one to n, where n is the number of bubbles on that diagram. Do not skip numbers. There is no meaning in the sequence of numbers. (Ie., the numbering implies nothing about the sequence in which the bubbles are processed.)

5. Children of bubbles on Diagram Zero and below are numbered by appending a period and a sequence number to the number of the parent. For example, the children of bubble 3.4 are 3.4.1, 3.4.2, 3.4.3, etc.. Again, do not skip numbers on the child diagrams.

6. Vectors may not be drawn directly between any two data stores, or external entities, or a data store and an external entity. Bubbles must be attached to at least one end of every vector.

7. A data store must appear on any diagram where the data store is shared by two or more bubbles. In any case, every data store must appear on at least one diagram of the set of DFD's. In any case, it is ok to show a data store if it is only used by one bubble. Any data store shown at a higher level must be then drawn whenever it is used by child bubbles.

8. External entities normally appear only on the Context Diagram and Diagram Zero. Often they are left off Diagram Zero.

Naming of Objects

1. Bubble names must start with a verb and be very explicit about the task being performed by the bubble. (Words ending in "ing" are not verbs.)

2. Forbidden verbs are "process" and "handle". These convey no information about what is happening in the bubble.

3. Data names must be precise and descriptive. Date, and student, for example, are bad data names. Data names are nouns.

4. Each bubble name must be unique in the set of Data Flow Diagrams.

Balancing

Every parent bubble must show all data input to and output from its child diagram. Decomposition of data items may result in the data names being different even when the levels are balanced.

Data Conservation

Every bubble must have access to all data stores and other sources of data (external entities, other bubbles) that are needed to create its output data items. A complex higher level bubble may disguise some of this access by hiding data stores until the bubble is decomposed.

Structured Specification Error List

1. Bubble names are not unique.
2. Vectors which must be labeled, are not.
3. Inconsistent use of files between DFD levels.
4. Balancing error.
5. Dashes left out of data names.
6. Bubble or data name is broken inappropriately.
7. Did not end a process description construct with necessary words.
8. Pages are not in order.
9. Format 9(n), where n is the number of process descriptions missing.
10. Did not use SQL verbs for file accesses. (Insert, delete, update, select).
11. File use in process description is inconsistent with use shown on DFD.
    Maybe vector is going wrong direction.
12. Process description "sends" data somewhere. Build the data structure and
    leave it there, unless it is a record to be inserted into a file.
13. Bubble with several output vectors is not decomposed.
14. No table of contents and/or pages are not numbered.
15. Forbidden, inappropriate or confusing verb for a process.
16. Necessary file accesses (including inserts) are missing.
17. Components of process description statement do not make sense together
    as shown.
18. Must show data stores on every DFD page where there is a data store access
    of any type. Must not leave them off as is possible with external entities.
19. Bubble(s) do not begin with a verb.
20. Abbreviated bubble or data name(s).
21. Data names are too general, confusing, or inappropriate.
22. Bubble name does not describe a transformation of data. Could be that the name
    describes an event occurring outside the system boundary.
23. Data name starts with a verb.
24. Bubbles are not numbered or not numbered correctly.

The diagrams on the following pages are from Structured Analysis Methods For Computer Information Systems , Teague and Pidgeon, SRA, 1985.

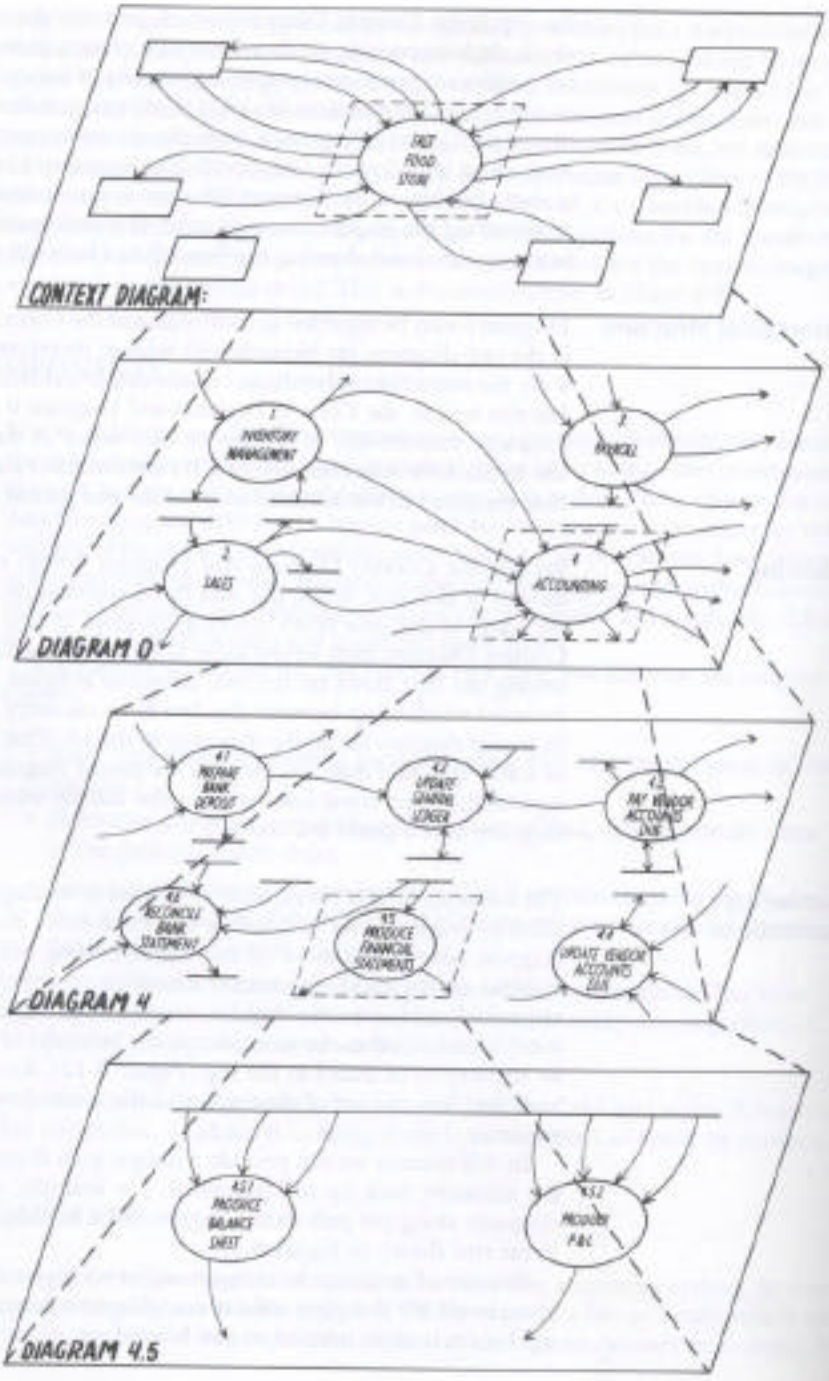

FIGURE 6-12. The hierarchy of data flow diagrams for the FastFood Store.

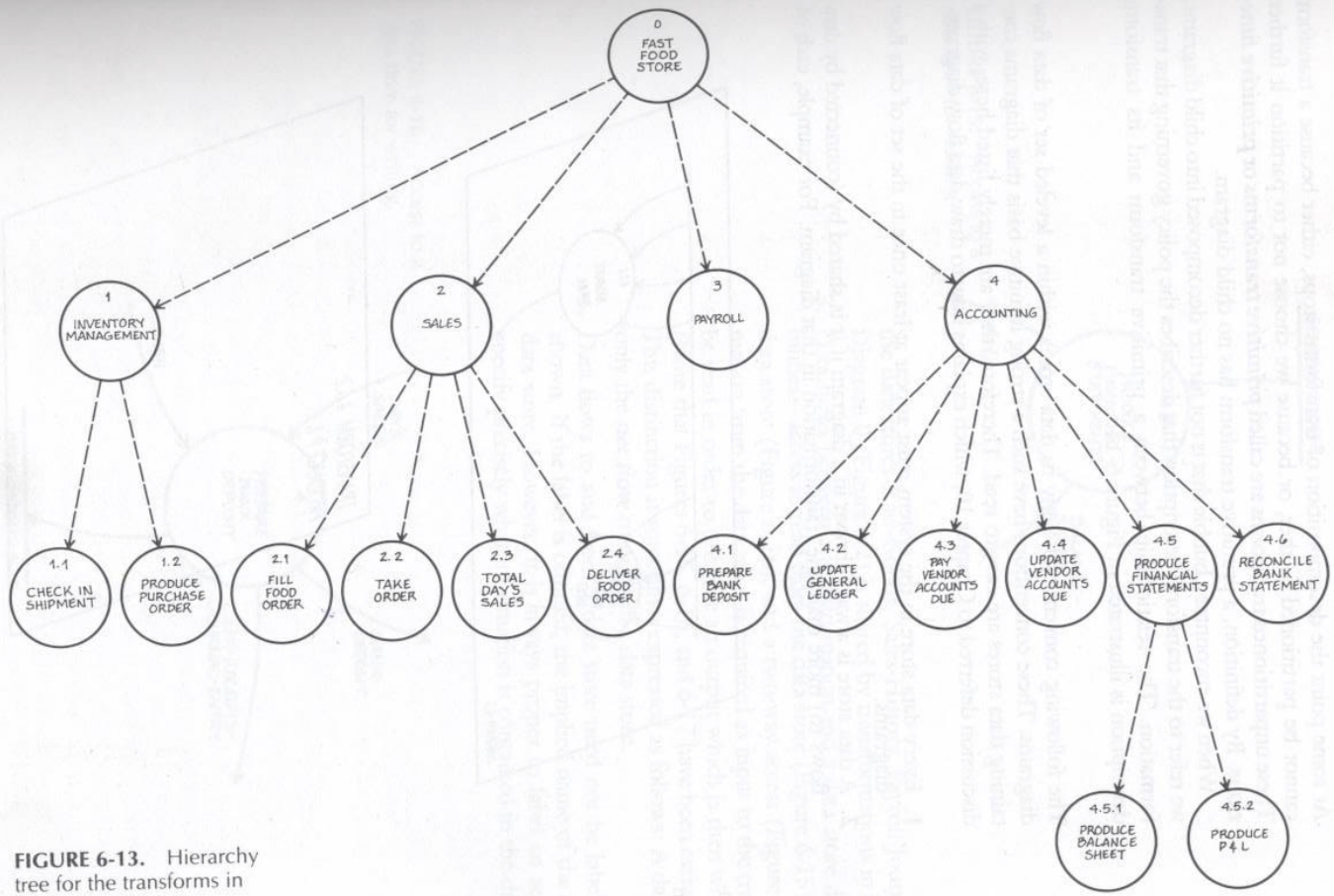

FIGURE 6-13. Hierarchy tree for the transforms in the FastFood Store.