Chapter 9
Planning and Managing
Knowledge-Based System Evaluations

The development of knowledge-based systems can be very complex, extending over a number of years and involving many people with different roles, a number of different design and development phases, and often different modules developed using different design approaches that must work together. The life cycle evaluations of the system will be correspondingly complex. They involve different types of evaluations, services of users and subject matter experts, coordination with the developer and sponsor, evaluation personnel with a variety of different specialties, uncertain requirements and changing development schedules. The system and its parts must be evaluated during different development phases, different aspects of the system must be evaluated, and different types of evaluations conducted at different places by different personnel. A comprehensive evaluation plan and schedule, which are integrated into the knowledge-based system development plan, are used to coordinate the many elements of the evaluations. By coordination, appropriate scheduling, and anticipating problems, early evaluation planning and management can facilitate efficient and effective use of evaluation resources and ensure that the evaluation information will be useful and used by the developer and sponsor. The purpose of this chapter is help the evaluator put all of the pieces together, i.e. to summarize procedures to structure the design and management of life cycle evaluations.

The approach to evaluation taken in this book is that the different evaluations in the life cycle set are parts that make up an overall evaluation. No one evaluation can address all the issues of concern, but the set of evaluations taken as a whole can attempt to do so. Taken together, the set of evaluations will answer the questions: Does this system accomplish the objectives set for it and has it been implemented right?

Table 9-1 shows the overall tasks in planning and managing a set of evaluations extending throughout development. The tasks, which are discussed below, are not necessarily sequential. At least the first six are addressed at the beginning of the project. Step 3, Develop an Evaluation Master Plan, is an ongoing activity which incorporates results of all of the planning and managing steps. Initially, it will not have detailed plans in many sections, but these will be inserted as system development progresses. Some of the steps in Table 9-1, e.g. Step 7, Design the Evaluations, and Step 12, Conduct the Evaluations, are carried out repeatedly at different points in the development cycle for the different evaluations. Knowledge-based system requirements, the development schedule,
Table 9-1. Steps in Planning and Managing Life Cycle KBS Evaluations

1. Identify an Evaluation Coordination Group

2. Choose or identify the evaluation team; specify roles and responsibilities

3. Develop an Evaluation Master Plan

4. Develop evaluation issues based on:
   - Sponsor’s objectives in developing the KBS
   - Requirements for the KBS
   - Generic evaluation issues
   - Sponsor’s objectives for the evaluations
   - Management and design decisions which the evaluations are to inform

5. Determine evaluation constraints, including:
   - Evaluation funding
   - Availability of users and design and non-design SMEs
   - Maturity of the system at data collection points
   - Time to plan the evaluations
   - Number and expertise of evaluation personnel
   - Cooperation of sponsors and developers
   - Opportunity for evaluator to learn about users and organizational units using the system

6. Determine types of evaluations to be conducted, overall resources needed, and evaluation time frame

7. Design and plan individual evaluations. Construct detailed evaluation plans. Determine resources needed for each evaluation. For each issue and subissue, specify or define:
   - Which evaluations and issues will be addressed in each development phase
   - Dimensions, attributes, and criteria
   - Methods and instruments
   - Test cases and scenarios
   - Sources of data
   - Data analysis methods

8. Forecast and track software development and projected KBS capabilities
   - Initially for general set of evaluations
   - Later for specific evaluations

9. Prepare list of evaluation tasks; set task time-line

10. Prepare a plan for communication of results

11. Construct an evaluation management information system

12. Conduct evaluations, analyze data, and communicate evaluation results.