a. Problem Definition
Precise identification of the problem and of the feasible alternative courses of action that may be effective in solving the problem. The problem may be a query of whether a particular action will have a desired result, or it may be a more general search for the results of a change in internal or external variables or for an improved or optimal result given a variety of alternative courses of action.

b. Model Construction
Development of one or more representations of the most crucial aspects of the structure and operation of a system, and of the differences among the alternatives. These representations are in the form of mathematical models which can then be used to test hypotheses about the relationships between alternatives and measures of system performance. The type of model chosen (e.g., Markov chains, queuing models, Monte Carlo simulations, linear optimization models, etc.) will depend on the problem at hand.

c. Model Validation
A test of the reasonableness and predictive power of the model using past data, or data from an analogous set of circumstances. This step may take the form of a literature review which analyzes the past applications of the chosen model(s).

d. Data Collection
Collection of information relating to the parameters and variables incorporated in the chosen model(s) in the form which makes testing possible.

e. Model Testing and Analysis
Application of the model to the data to test hypotheses or to derive optimal outcomes in a problem-solving setting. Further validation of the model(s) (e.g., sensitivity analysis) may be appropriate at this stage.

f. Evaluation of Alternatives and Recommendations
Evaluation of the alternatives in terms of the measures of performance through the use of the model(s). In many cases the results of initial evaluation may indicate the need for refinement in the level of detail of the model (it may be too simple or too complex), adjustment of the database to support the new model, and re-evaluation of the alternatives. Recommendations for implementation of the solution(s) found should follow logically from the interpretative analysis.

7. PROGRAM EVALUATION
a. Statement of Purpose
b. Description of Program Inputs
c. Description of Program Activities
d. Performance Criteria
e. Operational Indicators
f. Research Design and Data Analysis
g. Conclusions and Recommendations

Typical title: “A Program Evaluation of the WIC Program in Clayton County”
A program evaluation, or evaluation research, is the use of systematic methods of empirical investigation to produce information useful for making a judgment about a program’s worth or performance, according to specified criteria. It may be an investigation of how and why a program operates as it does, and/or the measurement of the extent to which it has achieved certain objectives or has had certain other outcomes, and at what costs. It may include recommendations about the continuation, modification, or termination of the program. Among the elements of a program evaluation may be the following:

a. Statement of Purpose
   Identification of the ways that the collected information might be useful, and the intended or possible users of the information. Possible uses of the information would be to: (a) demonstrate the quality of a program and gain support for its continuation or expansion, (b) identify ways that the program could be improved, and/or (c) impartially compare competing programs or alternative methods or practices. Possible users of the information would be: legislators, budget officers, program sponsors, planners, administrators, service providers, and service recipients. To maximize the utility of the research for particular audiences, it is frequently important to include among the examined variables some which are amenable to manipulation and control.

b. Description of Program Inputs
   Description of human and capital resources available to the program, together with information on the program’s location, sponsorship, staffing patterns, length of time in operation, and other relevant structural characteristics.

c. Description of Program Activities
   Precise description of who has done what to whom, in what sequence, with what resources, under what supervision, within what period of time at what sites, and other relevant dimensions of program operation, so that there may be accurate specification of what program activities account for what effects.

d. Performance Criteria
   Presentation of the standards to be used in assessing the merit or the success or failure of the program. This may include a specification of the objectives of the program as well as beneficial and harmful outcomes and impacts that were unintended or unforeseen.

The objectives may include the stated formal objectives or official mandates of the program, and/or objectives formulated by the research or others. Note may be made as to whether the objectives are consistent or conflicting, or varying in importance.

Judgments may be made regarding the time period in which the objectives were to have been achieved or through which the effects were to continue to be felt. The timing and frequency of the measurements will depend on the interest in capturing delayed as well as immediate effects, and temporary as well as permanent effects.

Program objectives may fit into a hierarchy from immediate to ultimate, from lower-order to higher-order. A program evaluation may thus focus on (a) implementation...
variables in the administrative operation of the program, and/or (b) effectiveness, the extent to which the program as implemented achieved objectives or had other effects.

An implementation or process evaluation is concerned with how the program was established and carried out. It may simply measure “effort” or “utilization” (number of dollars spent, number of manhours or other resources consumed, number of activities performed or services produced, number of persons who received services, etc., and relationships among these variables). Alternatively, the study may investigate the degree to which the program was implemented or used as intended, the causes and consequences of the deviations from various implementation strategies, how well or how poorly the availability and use of resources and the performance of activities met programmatic expectations or standards, or what proportion of eligible users of the program actually used the program.

An effectiveness or outcome or impact evaluation measures the extent to which the program produced chances in the status or behavior of users or had other desirable and undesirable outcomes. The study may include a concern with “adequacy,” i.e., actual performance level relative to the level needed to eliminate all or a realistic amount of the total problem or need that existed. Or the study may be concerned with “efficiency,” the relationship between the program’s benefits and the costs incurred in producing those benefits.

e. Operational Indicators
   Translation of each criterion into procedures by which outcomes can be observed and measured, so that it can be determined whether or to what extent the criterion has been satisfied.

f. Research Design and Data Analysis
   Description and defense of the strategies used for the collection, reduction, and analysis of data; and presentation of findings based on this analysis. In outcome evaluations, there may be a need for collection and presentation of base-line and post-intervention data on the conditions which the program is intended to change. There must also be identification and, ideally, control (by data collection or statistical procedures) of activities and events occurring within the implementing organization, among the affected groups, or in the larger environment which were not part of the program under study but which may offer competing explanations for any observed changes.

g. Conclusions and Recommendations
   Judgments as to whether the program satisfied each of the specified criteria to an acceptable degree, and recommendations on that basis to continue, expand, reduce, modify, or terminate the program. If the level or mix of outcomes is found to be less than ideal, it is important to try to determine whether the results were due to resource inadequacies or other problems in implementation, or to error or underdevelopment in the underlying assumptions about the relationship between program activities and outcomes. Suggestions may be made for replacement of the program with an alternative, or for reforms in program objectives, design, operation, scope, or funding level.