Merging Program-theory and Market Theory In the Evaluation Planning Process

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ABSTRACT

This paper discusses concepts for planning evaluations of market preparation, market transformation and market effects programs. The paper proposes the use of an integrated planning approach incorporating program-theory and market-theory into the evaluation planning process. The paper discusses past energy program evaluation planning practices in which evaluators classify evaluations into one of four categories (process, impact, market, and marketing), and the use of program-theory and market-theory as evaluation planning tools. For market effects programs, integrating the use of program-theory and market-theory into a coordinated evaluation planning process, results in evaluations that are more likely to focus evaluation research on market events that are responsible for the market changes.

Introduction

Evaluation planning can be a complex and confusing process requiring policy makers, evaluators, managers and administrators to focus limited evaluation dollars on program efforts that are not fully developed or matured. Often evaluation planning efforts are structured based on projections of how a program is expected to operate, or on the expected market effects. In many cases, evaluation plans are linked to forecasted results of the program rather than indicators that the market has changed as a result of the program.

Typically program evaluators work with policy makers, managers and administrators to prioritize evaluation goals and identify measurement efforts that document the degree to which a program goal is being achieved. For demand reduction programs the goal is to determine the extent to which energy demand has been reduced. Similarly, for energy efficiency and conservation programs, evaluators often focus their evaluations on program-induced reductions in energy consumption. For these types of evaluations, the planning process is not focused on what changes to measure, but on how best to measure them. If the program's goal is to reduce energy consumption, the evaluation is focused on the single goal of estimating how much energy is being reduced. The planning efforts focus less on what to measure (kWh) and more on how best to produce the most reliable estimates of savings with the available research dollars.

Similarly, process evaluation planning is a relatively simple process. These evaluations typically focus on how a program is managed or operated and how to improve program operations. The process evaluation planning effort typically involves identifying what to examine and what criteria to apply in the examination in order to determine if that process is being conducted effectively, efficiently or prudently.

Market evaluations (not marketing), also called market assessments, market research or market operations evaluations, typically involve an examination of the characteristics of the market in which a program operates. This type of evaluation describes the structure of the market, the market actors, the relationships among actors, the target audiences, spatial locations of the target audiences, communications channels, important message content, and other aspects of the market. The results of these studies are typically used to plan programs or to identify how a program should be modified to better fit the operations or characteristics of the market. These studies also are important for focusing the evaluation efforts on market characteristics that are influenced by the program. Market evaluations should not be confused with marketing evaluations (a form of process evaluations) that focus on how a program is marketed or promoted and if the marketing activities are producing the desired result, or if different results can be expected with different marketing efforts.

In the past 20 years, the energy program evaluation community has integrated these types of evaluations through a process called program-theory evaluation planning. In program-theory planning, the focus of the planning efforts center on program linkages (inputs, processes, outputs and expected results). These linkages take the form of identifying program inputs (staff, equipment, expertise dollars, etc.), program processes (actions, events, methods, processes, etc.), outputs (changes in how things are done, program efforts, initiatives, etc.), and the expected results from those changes (energy savings, demand reduction, more energy efficient devices used in homes, etc.).

Most all evaluation efforts take the form of testing one or more components of an expressed or implied program-theory. Implied program theories are those in which there is no formal logic model detailing the inputs, processes, outputs and expected results associated with a given program. For example, we have seen a number of implied program theories that are related to the savings associated with the giving away of compact fluorescent lights. The implied theory is that, 1) a person is given a CFL, 2) that person installs the CFL in a fixture, 3) the fixture will be one used with some frequency, 4) the bulb replaces a higher wattage bulb, 5) the bulb that is removed will not be used for additional lighting in the home, 6) the person will see the benefits of the CFL, and 7) the person will purchase additional CFLs on their own. This chain of events is expected to lead to reduced energy consumption and newly acquired energy efficient behavior. This is a sample of a simplified implied program-theory.

Other program theories are typically expressed in the form of a logic model in which the linkages and associations are identified in enough detail that they can be used to plan the day-to-day activities associated with a program, or to focus an evaluation effort on key linkages identified in the expressed program-theory. Rogers, Petrosino, Huebner and Hacsi [1] state that a program-theory is an "explicit theory or model of how a program causes an intended or observed outcome." They further state that program-theory evaluations are evaluations in which an evaluation "is at least partly guided by the model [theory]." In other words, almost all evaluations are program-theory evaluations, as most all evaluations are, in some form, guided by the expressed or implied theory of the resources, operations and expected impacts associated with the program being evaluated. From this perspective, there is no such thing as an evaluation that is not a program-theory evaluation. However, the most important point of this definition is that the program-theory (expressed or implied) is used to guide the evaluation process. The use

of program-theory in the evaluation planning process can be as simple as planning an evaluation following a discussion with program mangers about what the program is to do and how it will accomplish their goals, or as complex as using a structured series of draft logic models in which the details of the program's inputs, processes, outputs and expected results are documented in a final program logic model. Most program-theory evaluations can be found somewhere in the middle of these two extremes.

While the theory supporting program-theory evaluation planning seems sound, there are few examples in the literature of how program-theory evaluations have been applied to guide an evaluation process. Repetitive, systematic literature searches by leading evaluators have produced a surprising lack of documentation of this process[1].

This may be about to change. Efforts are underway in Wisconsin, California and other parts of the country to make more conscious use of program-theory driven evaluations. These efforts may provide some of the needed documentation on the application of this planning process.

While implicit or explicit program-theory evaluation (in some form) is almost always used for planning evaluation activities, it has significant weaknesses as an evaluation planning tool. In fact, a systematic review of the program-theory literature finds more publications dealing with the limitations and drawbacks associated with program-theory evaluation than literature identifying the benefits or strengths of the process, or the use of theory-based models to feed the evaluation process[1]. This is unfortunate in view of the fact that program-theory evaluation was first discussed in the literature beginning in the mid 1960's.[2] This causes one to wonder why there is so little published literature on the successful use of this valuable tool.

Weaknesses of Program-Theory Evaluation

The evaluation literature identifies one important weakness associated with theory-based evaluations. However, the authors of this paper believe that there are actually two significant weaknesses. The first (causality weaknesses) is widely discussed in the program-theory literature. The second is associated with the linkages between the actual market environment in which a program operates and the theoretical models about how a program operates within that environment. This second weakness has not been widely discussed.

Causality Weakness

According to Scriven[3] causation is like the "relationship between a mosquito and a mosquito bite." The second cannot occur without the first. The weakness most often expressed in the literature regarding program-theory evaluation is that program-theory, while detailing the linkages by which a program is to reach expected outcomes, is a hypothesis about causal relationships. That is, according to Davidson[4], there may not be a causality link between the program-theory and the expected outcomes or result. Program-theory does not require the demonstration of causality; only the assumption of a linkage between the two elements of a model is necessary. Unfortunately, the fact that program designers think there is a causal relationship does not mean that there is a relationship. For example, there have been a number of

energy programs that have assumed that extending credit for the purchase and installation of energy efficient technologies will lead to reduced energy consumption. One of these programs assumed that the reason people were not implementing energy efficiency improvements in their homes was that they lacked the money to install energy savings measures.[5] The program-theory assumed that if credit was extended to customers they would take advantage of the line of credit to take the actions needed to reduce their energy bills. The program-theory seemed logical to the program designers.

Unfortunately, residents in this program's target community do not use credit to finance home improvements[6]. While the program-theory assumed a relationship, there was none except in the minds of the program planners. The program-theory did not reflect the actual operations of the market. Program designers misread the market and how it operates, and used a nonexistent logical relationship to build a program in which few customers participated.

A program-theory can also exclude or ignore key causal relationships that do exist and which impact the ability of the program to achieve the intended goal. In a recent community-based program, program designers assumed that if they hired local staff to canvas neighborhoods and install free no-cost low-cost energy savings measures, the program would be successful at reducing energy consumption in the targeted neighborhood.[7] The program-theory assumed that customers would be supportive to the program's implementation strategy by: 1) being receptive to the promotional message, 2) allowing program staff in their home, and 3) letting staff install the measures that produce the energy savings. The program's theory seemed simple, and above all, rational in it's reasoning that free measures, installed by skilled staff, will lead to reductions in energy consumption. However, in this case, the program hired door-to-door staff whose appearance significantly reduced the effectiveness of the program. The program-theory missed the causal relationship between the credibility of the staff as reflected in their appearance, and customers' acceptance of strangers in the home. In this case, the program-theory may have been correct, but it omitted or ignored a critical component of customer acceptance. Only when evaluation staff conducted on-site inspections of the door-to-door efforts was this relationship identified. The program-theory missed the relationship between staff appearance, customer trust, and access to the home.

According Davidson[3], there are numerous examples of program-theory evaluations conducted in the last several years in which evaluation studies, guided by program theories, confirmed that program actions were taken and that market changes occurred. However, few of these studies are able to demonstrate causal relationships between the two events.[1,3] In all of these studies, key elements, associated with the elimination of alternative hypotheses, were not included in the program-theory, and were therefore missed in the evaluation efforts guided by those theories. In one such study, involving the correctional development of juveniles, the author identified more alternative hypotheses missed by the program-theory for why the changes occurred than the number of linkages identified in the program-theory. The evaluation guided by only by the program-theory missed so many of the market conditions that may have lead to the observed results that it rendered the evaluation meaningless. As a result, the author was unable to determine if the market conditions occurred as a result of the program, or as a result of one or more of the unidentified and untested relationships.

It is becoming painfully evident that reliance on only the program-theory to plan the evaluation efforts can miss critical market conditions that directly impact the success of the program as well as the evaluation effort. This is not only common, but in most social service program evaluations, is normal.

Market Knowledge Weaknesses

A second weakness is that program-theory evaluation can, and typically does, ignore many of the conditions of the market in which the program is expected to operate. A program-theory can be expressed and used to guide the design and implementation of a program without being integrated with a model of the market. In an evaluation of the new commercial office building market,[6] Kunkle and Lutzenhiser call for a new process that incorporates market operations and conditions in the program design and evaluation planning process. This approach is similar to the evaluation planning process adopted by the Northwest Energy Efficiency Alliance in which market assessments are incorporated into all program evaluation planning processes. The Alliance uses a combination of program-theory and market operations research to guide the evaluation process. Previous to these efforts, Reed[8] had recommend a similar approach and stressed the need to plan market effects evaluations that are guided by the theories on the operations of the markets.

The demonstration of the inadequacies of excluding market operations theories in program and evaluation planning efforts is not a recent event. Two of the first energy program evaluations that identified the need for both the program design processes and the evaluation planning process to understand the operations of a market were conducted in the early 1980s.[9,10] In these studies Hall identified market-associated weaknesses in the program planning and design process for the USDOE Commercial and Apartment Conservation Service Program (CACS), and for the Commercial Energy Audit Program that supported the CACS program. In both of these studies, significant program-theory assumptions about the market, the product and the anticipated demand for the product were shown to be in error. These studies lead to the market-theory evaluation finding, that to be effective, the CACS program would need to be funded at a level high enough to satisfy customer product and service demands and that those demands were inconsistent with the program theories and designs supporting the CACS program. As a result of these studies and others, the federal government reexamined the need for the CACS program in its planned configuration.

According to a study sponsored by the California Institute for Energy Efficiency and the Northwest Energy Efficiency Alliance, most markets are much more complex than the program theories that inform both the program design process and the evaluation planning process.[11] This study identified the need to understand program markets before program theories or theory-based evaluations are conducted. Programs targeting the commercial sector often assume that the commercial building market is homogeneous and often ignore differences in building ownership, architectural and engineering practice, stakeholder investment strategies, construction timelines, and design approaches in their program theories. Reed has demonstrated that customer and market characteristics associated with these market considerations have a dramatic impact on a program's ability to impact the market.[8, 12, 13, 14] Kunkle and Lutzenhiser [6] reached a similar

finding in a study of the commercial office building markets. In this study, the authors identify key market conditions that were missed in the program-theory, and these errors directly lead to less efficient commercial building programs on the west coast.

The identification of the need to have market information feed the planning process is recognized in other countries as well. Lukas Weber, of the Swiss Federal Institute of Technology, in Zurich, Switzerland[15] concluded that program theories about how markets work are often incorrect, and as a result, miss critical links in how markets operate and how programs should be designed and marketed. If program evaluators use program theories that are incorrect as the only input to guide their evaluation efforts, they are essentially playing follow-the-leader down a path that may not be reflective of the operations of the market. They therefore can miss key evaluation metrics that are excluded from the program-theory. Program theories almost never identify all of the key market linkages that directly impact the success of the program.

Conclusion

The authors of this paper believe that program theories that are developed in the absence of good market assessments are likely to lead to programs and evaluations that misallocate resources, address factors that are not important or irrelevant, and reduce the general effectiveness of programs. With market transformation, market effects, market preparation or other programs that specifically attempt to change the operation of markets structures, the evaluation planning process must be grounded in the theories of how the market operates. Evaluation planners that focus on the program theories to the exclusion of market theories risk missing the key market indicators or market operations impacts. The merging of market operations assessments and market theories, articulating how markets work, with the program design and development process, including the development of market theory based programs, is a substantial step forward for both the program design and evaluation communities. By integrating the two concepts program evaluators are no longer tied to over-simplistic program theories to plan their evaluation efforts.

The beauty of this integrated approach is that evaluators and designers use much the same information with respect to how the market operates. Program designers want to know how the market operates, who the key decision makers are, who are the information hubs, what motivates the information hubs, what reach do the information hubs have, how the use of information channels and communication hubs might benefit the program, what portions of the market are in each stage of the product diffusion process, what opportunities exist with key market segments, the stage of adoption of the market segments, how many units are moving through the market, how different kinds of units move through key distribution channels, who controls the market and these channels, how are they controlled, and what influences the operations of the market with respect to the key market actors, among other information. Fortunately, program evaluators need this same information in order to identify where to concentrate their evaluation efforts. It is impossible to monitor and evaluate all aspects associated with the operations of a market without unrestricted research budgets. Therefore evaluators must understand the operations of the market and the theories supporting market operations in order to identify the key targets of the evaluation.

For both program evaluators and program mangers, market assessments and market theories are critical. Even if program designers do not recognize or understand these relationships, evaluators must focus on the key market indicators expected to change as a result of the program. For programs that attempt to change how markets work, the evaluation effort needs to be grounded in the characteristics associated with the operations of the market that are expected to change. This is not necessarily true for process evaluations that look at internal processes. However, for market effects programs that are trying to change the way markets operate, integrating program theories and market operations theories to focus the evaluation effort on the expected market impacts, is important.

Integrating market-theory and program-theory into a coordinated planning process is a challenge. However, some key components in the process are certain. These include:

1. Evaluations should be guided by both the program and market operations theories associated with each program and each target market. Evaluators need to understand how the market operates in advance of the program, and must project how the program is expected to change the market.
2. Without an understanding of the operations of the market, critical mistakes focusing the evaluation efforts are likely.
3. Market assessments should lead to the development of market operations theories that are the basis of the evaluation planning process.
4. Market assessments need to focus on identifying a series of primary and secondary market change indicators that can be used to feed a theory of the operations of the market and establish points of measurement.
5. Evaluators and program planners need to reconcile the theories of the program and the market to identify points of measurement that can be used to confirm or reject alternative hypotheses regarding why markets are changing. With market effects programs that operate in a constantly changing competitive market, it is important to rule out alternative hypotheses of why markets are changing.

While program theories can be formulated independent of market theory, the absence of a good market theory makes this process more difficult and is likely to lead to both programs and program evaluations that are less effective. The integration of program and market theory is an important step forward in the evaluation planning process for market effects programs.

References

1. Program-theory in Evaluation: Challenges and Opportunities, Rogers, Hacsi, Petrosine and Huebner, Jossey-Bass Publishers, Number 87, Fall 2000.
2. Suchman, E.A, Evaluative Research: Principles and Practices in Public Service and Social Action Program, New York: Russell Sage Foundation, 1967.
3. Davidson, J, Ascertaining Causality in Theory-based Evaluation, Chapter 1; Program-theory in Evaluation: Challenges and Opportunities, Rogers, Hacsi, Petrosine and Huebner, Jossey-Bass Publishers, Number 87, Fall 2000.
4. Scriven, M, Evaluation Thesaurus, 4th edition, Thousand Oaks, California; Sage, 1991.
5. Neal, Betty; Sabo, Carol; Energy Conservation 2000 Mayville and Horicon: A Study Of

A Community-Based Program, Wisconsin Demand-Side Demonstration, April 1995
6. Kunkle, Rick, An Improved Model for New Commercial Office Building Markets: Implications for Market Research and Evaluation, International Energy Program Evaluation Conference, 2001 Proceedings, August 2001.
7. Talerico, T., Reed, J, Viroqua Conserves: A Study of A Community-0Based Program, Wisconsin Demand-Side Demonstrations, April, 1995.
8. Reed, J. H., N. P. Hall, PEC Market Effects Study Reed, PG&E, San Francisco, CA 1998.
9. Hall, N. P., Commercial Energy Audit: The Illinois Survey; Attitudes and Opinions from the Illinois Business Community, Illinois department of Energy and Natural Resources, June 1984.
10. Hall, N. P., An analysis of Consumer Demand for the Commercial and Apartment Conservation Service Program, The National Energy Conservation Evaluation Conference, Vol. 2, August 1984.
11. Blumstein, C., Symour G., Lutzenhiser, A Theory-Based Approach to Market Transformation, Energy Policy, 28:137-144.
12. Reed, J. H., Hall, N. P., Andrew Oh, The Structure and Operations of the Commercial Buildings Market, ACEEE Summer Study Proceedings, Vol. 4, page 267-282, Washington, DC, 2000
13. Reed, J. H., N. P. Hall, Andrew Oh, Baseline Market Study Assessing the Potential for PG&E's Daylighting Design, PG&E, San Francisco, CA, 1999.
14. ADM and TecMRKT Works, State-wide Survey of Multifamily Building Common Area Building Owners' Market, SCE, Rosemead, CA, 2000.
15. Weber, Lukas, An Evaluation of Energy-Relevant Decisions in Office Organizations, Swiss Federal Institute of Technology, Zurich, Switzerland, Proceedings of the 2001 International Energy Program Evaluation Conference, August 2001.