

The MEP Evaluation Approach: Past, Present and Future

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Overview

In 1995, the Manufacturing Extension Partnership (MEP) put in place a multi-pronged evaluation strategy that emphasizes examining impacts at both the client firm level and the MEP Center level. Accomplishments to date include setting up MEP-wide information collection systems, beginning work to compare clients with non-clients and to examine economic impacts beyond client firms, setting up systems for Center benchmarking, and developing a strong infrastructure to support the evaluation work.

Over the next three years, MEP's evaluation work will emphasize producing information that is useful for Center management and NIST MEP management. This emphasis will be supported by a greater focus on data quality, analysis, and preparation of products intended to present "actionable insights" for decision makers.

Introduction

Most analysts would agree that the heart of evaluation involves: The collection and analysis of data to gain a greater understanding of how well a specific institution is operating, and how it might operate better. This basic concept of evaluation underlies the evaluation work that NIST MEP has undertaken.

The MEP evaluation effort approaches evaluation with two key purposes in mind:

- Continuous improvement, and
- Program accountability.

In short, a key question is: "How to use the greater understanding of the MEP system that evaluation work can provide?"; this question has two possible answers. If one focuses on continuous improvement, then the greater understanding can help determine what types and levels of changes, directed at what points in the system, are likely to produce the

most positive effects. On the other hand, if one focuses on program accountability, then the greater understanding can help determine whether--or to what extent--the investment in the program is worthwhile.

These two purposes are mutually supportive. And, MEP has designed its evaluation effort to pursue both continuous improvement and program accountability.

MEP's Basic Approach to Evaluation

During the 1994-95 period, MEP constructed an evaluation strategy. This strategy was built on the foundation experience of the small network of the seven Centers that were funded by NIST during the early days (1989-94) of the MEP program. MEP developed the strategy over most of 1994, and incorporated the insights of a wide range of key experts. Much of the guidance came through the Evaluation Working Group, which in 1994 contained almost all of the key policy and evaluation experts from throughout the MEP system.

In all, input came through several sources:

First, the Evaluation Working Group hosted discussions of practical evaluation issues; for example: "What are the critical performance metrics for Centers? What project data can reasonably be collected? Where should we draw the line between larger projects--ones where we would generally expect some measurable impacts--and smaller projects--where we would be less likely to see impacts? Should that line be drawn at five hours of assistance, or eight hours, or 24 hours, or somewhere else? Of what significance are intermediate impacts? When during or following the assistance implementation cycle should data be collected?"

Second, individual experts prepared "white papers" on key evaluation issues; for example: how to use case studies as part of MEP's

evaluation approach; the advantages and disadvantages of various approaches to measuring return on investment.

Third, MEP used an informal group of advisors--a so-called "kitchen cabinet"--including Center Directors, evaluation experts and others, to provide ongoing guidance on policy and evaluation issues.

Fourth, a major national conference--held in September 1995--brought together academics, independent investigators, interested evaluators from across the MEP system and from other public programs, and others. This diverse group came together to review the draft evaluation strategy and to suggest revisions.

This open planning process led to an evaluation strategy that is a good example of an innovative approach to assessing the value of a public sector program. This strategy looks beyond outcome measurement by utilizing econometric analysis, balancing quantitative survey methodology with qualitative in-depth case studies, assessing Center performance both comprehensively and comparatively, and seeking to spread high quality management and service delivery practices systematically throughout the MEP network.

The MEP approach divides evaluation work into six categories, or strategies. The six strategies are:

Strategy I. Conduct project-level evaluation.

Measuring short-term impacts of specific engagements--e.g., technical assistance provided to small manufacturing firms by MEP Centers--can produce early information about emerging trends, potential problems, and opportunities for improvements. It can also satisfy stakeholders' needs for outcome measures, such as in annual budget reviews.

Strategy II. Conduct firm-level long-term evaluation.

Many believe that the impact of manufacturing extension is most fully measured only over the long term. For example: product development assistance typically requires a minimum of two years to achieve results in the marketplace; years after creating manufacturing cells, the effects of associated team-based organization, reduced inventory, and increased throughput on the firm's bottom line may continue to grow; the effects of integrating information systems across manufacturing and business management functions may become apparent only in terms of the firm's long-term survival, and may never show up in its financial statements.

Consequently, MEP is developing methodologies to trace the long-term effects of assistance on client firms in comparison to non-client firms, in terms of productivity, employment growth and survival rates.

Strategy III. Regularly assess individual Center performance.

MEP's statute requires a third-year review by an outside panel--chaired by a NIST official--before awarding federal funds for later years (15 U.S.C. 278k (c)(5)). In most cases, Center performance justifies continued funding; therefore, the focus of the Center review is usually on opportunities for continuous improvement. Each panel--made up of managers from other Centers, manufacturers, economic development specialists, and a NIST chair--reviews a progress report written by the Center, reviews other information collected by the MEP staff, listens to a presentation by Center personnel, and engages in a thorough discussion of issues with the Center. After its review, the panel issues a report assessing the Center's work and making recommendations that would improve performance.

New legislation also requires a six-year Center review as one condition for further funding. MEP is developing new procedures for this review that will provide Centers an opportunity to demonstrate that they are high performance organizations.

In addition, MEP Regional Managers annually review each Center in terms of: performance relative to its plans; leadership position in the local economic development community and among industrial service providers; strategic plan and strategy development processes; customer relationship management and market focus; information systems and use of data; human resource development and management processes; and integration of marketing, sales, service delivery, and evaluation processes.

Strategy IV. Regularly assess NIST MEP performance.

Ideally, the MEP program should be more than the sum of its Centers. To achieve this, NIST MEP must provide value to Centers beyond federal funding. This value would be produced if MEP can accelerate Centers' productivity with a variety of services, including additional tools, specialty expertise, national marketing support, inter-Center networking, and efficient evaluation services.

MEP's performance as a catalyst, research and development center, support organization, and evaluator is therefore also subject to evaluation.

Strategy V. Assess program on the creation of an integrated, continuously improving national service delivery system.

Over its first few years of operation, MEP has focused on covering the nation with manufacturing extension services. Having achieved that goal, recently MEP has changed its emphasis, focusing now on upgrading the delivery of effective services to small manufacturers by all Centers, in order to achieve a high-performing national system.

Strategy VI. Interpret, verify and report on national program mission and results.

As the largest single source of manufacturing extension support in the nation, MEP has a responsibility to key stakeholders--Congress, taxpayers, manufacturers' groups, labor unions, and others--to compile accurate national program outcomes and to report regularly on progress against the national program mission.

The intent of the MEP evaluation strategy document was to lay out work over a five-year planning horizon. Thus, implementing the strategy has required choices in terms of sequencing activities and setting priorities.

Some specific evaluation activities logically had to precede others. For example, data reporting and management systems development logically had to precede data analysis. Also, long-term assessment of client impacts could not occur until a sufficiently large population of served clients had "aged" long enough so that they could be identified across a multi-year study period covered by the semi-decennial Census of Manufacturers and the annual Survey of Manufacturers.

Other choices reflect MEP's evaluation priorities, based either on the importance of the project, or on MEP's ability to deliver the most bang for the buck. This priority-setting process has meant deferral of some important work, particularly under Strategies IV and V.

Some customers have misunderstood the relative emphasis placed on various components of the MEP evaluation work. Perhaps because of its visibility, and because early implementation of reporting procedures proved unexpectedly difficult, the client valuation survey, administered by the U.S. Census Bureau, has mistakenly appeared to some as the primary--if not sole--evaluation activity in the system.

For example, a Center director recently lamented that a valuable recent

project, using the World Wide Web to match manufacturers with users of their waste resources, will have great impacts on clients, but the work is not easily measurable with the client valuation survey. The director's perception was that the only way for a Center to report beneficial impacts of its work with manufacturers was through the survey. This director was surprised, but pleased, to learn that this project would be an excellent candidate for an in-depth case study.

The above is a thumbnail sketch of the MEP evaluation approach. We next turn to a description of our implementation efforts. First, we describe our accomplishments to date, and then, our work focus for the next three years.

Accomplishments Over the Past Two-to-three Years

In a systematic approach to evaluating a start-up government program, at least two--fairly different--phases are needed. For MEP, the first phase involved developing the evaluation strategy, creating reporting mechanisms, collecting information, and piloting methodologies. As many of these processes have become routinized, a second phase is emerging. The second phase will involve analyzing data, converting it to information, working with customers to apply information toward solving problems, developing "actionable insights," and producing evaluation products.

Major progress has been made on several fronts over the past 2-3 years or so, during the first phase of MEP's evaluation work. Five key areas of accomplishment stand out:

- *First*—major data collection systems, focusing on Center activities, are in place. One system collects financial and activity information from each MEP Center on a monthly and a semi-annual basis. This system

permits the production of regular reports describing various measures of Center finances, workloads, productivity, and efficiency.

A second system collects impact information from firms served; this information is collected on a rolling basis 8-10 months after project close, to learn how the clients value the impacts of the assistance they have received. Response rates have been outstanding: overall, 77 percent of clients contacted have responded; and, of clients identifying specific business, job and/or capital investment impacts, 85 percent have been able to quantify at least one of these impacts.

A third data collection system emphasizes qualitative, rather than quantitative, data about Center assistance to firms. MEP has established a large group of trained Center evaluators, academic researchers, and system consultants to document client impacts through in-depth case studies that follow a rigorous analytical logic model. The logic model has been tested, and MEP published the first compendium of 24 case studies in May 1997. An additional 18 case studies are currently in progress.

Together, these data sources can provide a good picture of (1) what the MEP system is doing (thus permitting the use of efficiency measures) and (2) how well it is improving the competitiveness of small manufacturers (permitting the use of effectiveness measures). Implementing these systems has not been painless, but Center participation is now approaching 100% and data quality continues to improve. In short, the information collection systems are in place and are functioning reasonably well.

- *Second*—a system for comparing clients with comparable non-clients has been developed and is being tested. While preserving confidentiality, the U.S. Census Bureau has been able--for a small group of selected Centers--to identify a significant

proportion of clients in the semi-decennial Census of Manufacturers and the annual Survey of Manufacturers, and to compare the performance of clients to that of non-clients over a period of several years.

Preliminary results from using this approach show an encouraging productivity effect. By feeding this effect into a regional economic model (REMI), analysts have estimated that the fiscal effects of the NIST MEP effort exceed its cost, and that the economic benefits of the program are significant.

This method is also being applied to employment-based data sources to compare clients and non-clients in terms of employment growth rates and survival rates. In sum, MEP has developed a unique approach to measuring long-term program impacts, and this approach appears very promising.

- *Third*—MEP has developed--and is currently testing--a system for examining impacts beyond client firms. Under this system, client outcomes are taken from the short-term impacts survey, and then run through a highly-respected regional economic model (REMI). This model quantifies secondary and tertiary multiplier effects, while discounting that portion of the effects that come out of neighboring competitors' contribution to the economy (the "transfer" effect). With the benefits measured in this way, matched with system and client cost information from other data sources, a benefit/cost ratio for the program can be estimated. In short, use of REMI enables a look beyond client firms to the broader downstream economic impacts and the fiscal benefits and costs of the MEP program.

- *Fourth*—systems intended to enable Centers to benchmark their operations and performance against other individual Centers or groups of Centers are under development.

One effort, funded by MEP, involves 14 Centers which have agreed to share information among themselves on a rigorously-defined set of common management metrics. This process produces high-quality benchmarks to support continuous management improvement for the participating Centers.

Another effort along the same lines has sprung up from a Center initiative, involving five Centers. This group uses a different set of metrics, emphasizing aspects of Center business performance.

A third effort, also MEP-funded, uses a linear programming technique called data envelopment analysis to identify the highest-performing Centers in terms of a mix of productivity and cost-effectiveness measures.

This project is intended to produce a method that will permit a Center to benchmark its performance against the highest-performing Centers that are most like it in terms of objectives. Centers will often find it useful to compare themselves with others; these developing benchmarking systems will enable them to do so.

- *Fifth*—MEP has developed a strong and useful infrastructure to support its program evaluation work. One key element of this infrastructure is a series of agreements with a variety of consultants and academic researchers—with expertise in specific evaluation and analysis methodologies, manufacturing extension, economic development, and other relevant subject matter areas. With these agreements in place, MEP can—and does—call on these resources as needed to help collect and analyze data, review draft plans and products, and provide technical insights on work in progress. Having such resources available has been so useful that MEP is working to expand the number of these agreements it maintains.

Another key element of this infrastructure is the Evaluation Working

Group, made up of evaluation contacts at each Center, interested Center Directors, and consultants involved in various aspects of manufacturing extension work. The most recent meeting of the Evaluation Working Group—held in September 1997—had 118 people in attendance. Topics addressed every level of the MEP program; for example: the role of continuous improvement in the lifecycle of MEP; continuous improvement systems currently in place at MEP Centers; continuous improvement of the NIST client valuation survey; and dissemination of distinctive management practices throughout the national MEP system. MEP intends to continue using the Evaluation Working Group in evaluation design and implementation.

To guide program development directly (and program evaluation indirectly), MEP's senior management team is in the midst of a strategic planning effort to direct the MEP system through the next several years. When completed, this effort will provide strong overall guidance to the MEP evaluation work. Completion is expected during the first half of 1998.

MEP semi-annually compiles and distributes a *National Data Highlights* publication, which provides national totals of key outputs and outcomes generated by the MEP system. As the MEP strategic plan gains widespread acceptance and approval, this document will likely be modified; it should become an opportunity to report on progress against the MEP system's strategic goals and objectives.

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In addition, in September 1997, the officially-chartered MEP National Advisory Board convened for the first time. Board members represent the views and needs of customers, providers, and others interested in manufacturing extension throughout the U.S. The Board will provide guidance to MEP on key management and policy issues, including evaluation.

What Needs to be Done Over the Next Three Years

In mid-1997, the MEP Evaluation Team engaged in an interim planning exercise that involved assessing accomplishments to date, and assessing the current state of the MEP evaluation effort, prior to looking ahead to the work to be carried out over the next few years.

The Team's basic conclusion was that the work of the past 2-3 years has set a solid foundation for future analytical efforts, and that the evaluation effort now has an opportunity to focus on some different tasks.

Looking ahead, MEP's evaluation work should line up with three key goals:

- Evaluation should contribute to high performance Centers by providing actionable insights to Centers and Regional Managers;
- Evaluation should contribute to a high performance MEP system by providing actionable insights to senior MEP management; and
- Evaluation should contribute to a well-understood MEP system by assessing program results and providing them to senior MEP management and Centers.

In working to achieve these goals over the next three years, MEP's evaluation work will focus on four key dimensions:

Greater focus on information for use by Customers

The key direct customers for MEP's evaluation work are the Centers and MEP's stakeholders. Both of these customer groups are interested in both the continuous improvement and the program accountability aspects of evaluation. Much of the evaluation information useful to Centers will be provided through the MEP Regional Managers who work directly with individual Centers on a daily basis. Senior MEP managers will often want to provide key evaluation information to interested parties in the Administration and in Congress. Centers will want to provide state-level evaluation information to interested state stakeholders as well.

Over the past two years, as data collection systems were being established, only limited information has been available from the evaluation work to share with key customers.

With greater data availability, providing that information to customers will now become a major focus.

Greater focus on data quality

The basic law of computer science--garbage in, garbage out--also applies to the evaluation process. Thus, only with high quality data are high quality analyses possible. Data collection procedures result in high quality data consistently only if they are clear and easily applied to all cases. In the MEP system, these procedures are not mandatory; in addition, Centers vary widely across several critical program dimensions. Consequently, the quality of data across the system is somewhat variable.

As a primary approach for addressing these data quality issues, MEP has developed the concept of "quadrangulation" to improve data comparability. The concept is simply stated: if a Center is to report a particular assistance activity and the client outcomes it produces, it must also report the associated

staff, expenses, and fees associated with that activity. Applying this concept successfully across all Centers will improve the system's data quality dramatically. Working through the Regional Managers, MEP Evaluation Team members will be striving to ensure that all Center reporting systems are fully quadrangulated by the end of 1998.

MEP is also undertaking a comprehensive--top to bottom--continuous improvement review of the client valuation survey. This review will examine the survey instrument itself, as well as the entire survey process. This review has a target completion date that will permit implementing any resulting recommendations by August 1998.

At the same time, MEP is committed to an even wider review of all Center performance measurements, and the associated data reporting and collection mechanisms they require. As MEP solidifies its strategic plan, understands the benchmarking needs of Centers more precisely, and reorganizes its Center review process to focus more strongly on creating high performance Centers, then better alignment of data collection and data quality efforts with the evolving needs of the MEP system will be possible. After this improved alignment, it is reasonable to expect that all collected data will support management information needs and will be of high quality.

Greater focus on analysis

The major data systems mentioned above--the reporting system, client valuation survey system, and the case study system--were established to help answer important questions about the operation of the overall MEP system and individual Centers. To date, little analysis has been carried out using the data. Now that these data sets are becoming more densely populated, the MEP evaluation effort will move forward by focusing a large part of its resources on data analysis.

The analytical focus is closely related to the customer focus (described above); data that has been analyzed will be much more useful to customers than raw data. Thus, a primary purpose of data analysis is to provide customers with 'actionable insights,' suggesting specific actions they can take that will drive improvements in a Center or across the system as a whole.

Greater focus on products

As MEP turns its attention from process development to analysis, new and useful products will emerge. Already new reports have been produced that highlight key indicators of Center progress--showing, for example, system-wide benchmarks at the 90th percentile, and intra-Center month-to-month trends. This focus on products is also closely related to the customer focus; for example, these new highlights reports were suggested by--and developed in conjunction with--the MEP Regional Managers, a key customer group.

Future products will include:

- Improved tools to measure client satisfaction;
- New tools to measure employee perceptions and attitudes;
- Analyses of the factors that produce strong client impacts under different conditions--with a special focus on identification of high performance services;
- Analyses of the willingness of different-sized client firms to pay fees for extension services;
- Analyses of benchmarking data using a variety of comparison group analysis techniques;
- Additional benchmarking measures;
- Program accountability measures that can be used for communicating with state legislatures;
- Regional economic impact analyses;

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- Improved access to data through the World Wide Web; and
 - New reports summarizing national system performance.

In addition to these four focus areas, the MEP evaluation work over the next three years or so will address a number of other areas. Among these are:

- Beyond upgrading data collection and analysis systems, MEP will carry out some one-shot studies of special issues (e.g., does the pressure to produce more fee revenues push Centers to serve larger firms);
- MEP will undertake a thorough reexamination of the major Center review process, including a rethinking of the best way to effectively deal with poor Center performance;
- MEP will expand its reach into the evaluation community--bringing in a handful of evaluation experts not currently inside the MEP evaluation community;
- The MEP evaluation work will be expanded--especially in terms of case studies--to look at instances of failure as well as success; and
- Working through the Evaluation Working Group, the MEP evaluation system will put greater emphasis on improving the ability of individual Centers to effectively design and use evaluation to upgrade management capability.

Future Directions

Evaluation is always a challenging enterprise.

It involves trying to determine the answers to important questions within often severe time and other resource constraints. In addition to the usual challenges, evaluation at MEP has faced a somewhat unusual challenge: MEP is a brand new program. Thus, a new evaluation system has been designed and implemented while, simultaneously, the program itself has been designed and implemented.

The MEP system as a whole is currently involved in thoughtful self-examination: the MEP strategic planning process. The MEP strategic plan that emerges from that process will set the framework for future MEP evaluation work.

Once the basic structure of the MEP strategic plan becomes clear, then the MEP evaluation effort will be thoroughly reexamined. All aspects of the evaluation effort will be on the table for review; no components will be out-of-bounds. A wide-ranging process will be established for assuring the design of the MEP evaluation system so that it is fully supportive of the MEP strategic plan. Key participants in the reexamination process will include evaluation experts from inside and outside the MEP system, and key players (e.g., Center directors, MEP senior management) from within the MEP system.

It is quite plausible that the four key focus areas spelled out above--customer focus, data quality focus, data analysis focus, and products focus--will continue as focus areas after the reexamination process. It is also plausible, however, that additional focus areas may force a reprioritization of work--this is because the MEP evaluation work must concentrate on measuring progress in terms of the strategic priorities and questions identified in the MEP strategic plan.

Thus, MEP evaluation is now at an important crossroads, where it can build upon the data systems put in place over the past

couple of years, and can now begin to provide a significant level of useful information about the MEP system to key decision-makers within the system. In addition, a major reexamination of the MEP evaluation strategy will be undertaken within the next few months, and it will be firmly based upon the foundation of the MEP strategic plan. The evaluation effort can- and must--be central to the task of determining the MEP system's success in achieving its strategic goals and objectives.

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