

USE OF EXTERNAL REVIEW PANELS IN EVALUATING MANUFACTUR- ING TECHNOLOGY PROGRAMS

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During the entire development of the National Institute of Science and Technology (NIST) Manufacturing Technology Center (MTC) program a combination of public and private sector reviewers have been used to provide guidance to these centers. External reviewers comprised of industry and academic professionals bring different perspectives from the internal NIST reviewers based on their background, present working environments, and separation from the line management of the program. This paper discusses the value of external reviewers, particularly industrial participants, to the development of responsive and valued manufacturing technology programs.

The External Reviewer

For the purposes of this paper, external reviewers are defined as individuals that volunteer their time to provide periodic reviews of manufacturing programs in order to encourage production of valuable results. Primarily, these reviewers come from two different backgrounds, academia and industry, and this paper will focus on the industrial reviewer. They typically have some knowledge of manufacturing processes or economics and view their participation as a source of civic contribution to the efficient use of tax proceeds. Since they are not in the line management of the organization or the funding source, they tend to be more outspoken in their comments and suggestions. Their value to the review process is closely oriented to their experience and their objectivity.

Industrial reviewers can be located through local or national professional associations such as:

- SME - Society of Manufacturing Engineers
- ASME - American Society of Mechanical Engineers
- IEEE - Institute of Electrical and Electronics Engineers
- NSPE - National Association of Professional Engineers
- SCORE - Service Core of Retired Executives.

Many of these groups have local organizations that have a group of active members that can be called upon for review of local operations.

Characteristics that should be sought in an external reviewer are:

- Objectivity - there should be no present or future link between the reviewer, the program, and the funding agency.
- Experience - an external reviewer for a manufacturing program of this type should have experience in either making products or in the economics/management of business operations. The appreciation of the capitalist system from a business standpoint is perhaps the key value that will distinguish the vantage point of an industrial participant from an academic or organizational reviewer.
- Outspoken - Look for reviewers that willingly state their opinions. Since most of the resulting documentation is filtered through several revisions, only the most persistent of external comments will surface to affect the program.
- Willingness - External reviewers will spend considerable time without any compensation in the process of trying to affect a program that they will not benefit from other than the sense of trying to contribute. A unique willingness to commit to a long-term relationship is needed if continuity (i.e., consistent monitoring of progress) is to be possible.

Why Seek External Reviewers?

The location and coordination of external reviewers takes considerable effort. Given this fact, one must ask what value do external reviewers bring to the evaluation process? To address this question, the fundamental purposes of program evaluation must be understood and the importance of external reviewers to each purpose described.

In the case of this new government program, evaluation is mandated. It is part of the Act. Therefore, evaluation plays at least two roles - a

political role and a value determining role. In the realm of tighter budgets, often the primary emphasis of the evaluation effort becomes one of justification - showing that the value received is reasonable for the appropriations expended. As a result, internal reviewers can have a self-preserving vantage point, seeking data that quantify the programs in terms of number of interactions, measurable economic results, geographic coverage because these are the data that will provide justification for the program. Significant amounts of data have been compiled listing number of client visits, number of seminars presented, number of projects started, number of projects completed, savings as a result of efforts, percentage of area companies contacted, etc. These data alone do not answer the most basic question - what is the value to the user?

External reviewers bring a different perspective to the evaluation of the program. They are most likely to view the program asking, "What is being produced of value that I would find useful in my operations?" In other words - is all this data quantifying worthwhile activities? In the formative years of a program, the emphasis on evaluation should take a back seat to experimentation leading to improvement in services provided. To some extent, this has happened in the NIST program since it was such a new effort and the initial centers were diversified in their structure and audience. Focus on the fundamental usefulness of the service initially leads to services of value in the long term.

Therefore it is critical that the target of the services be involved in the evaluation of the services. The target is the manufacturing business. The services provided must be useful (timely, responsive, cost effective) and they must be marketed successfully. External industrial reviewers are likely to understand the needs of the target audience from a vantage point of personal experience focusing on the value and uniqueness of the service provided. The process of understanding the market, meeting the market needs, then measuring the success of the service is the approach that results from this type of reviewer.

External industrial reviewers will tend to look for evidence in the manufacturing outreach program of the following:

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- Availability of capital - how does the local manufacturer find funding to upgrade skills and equipment, how does the center serve these needs.
 - Access to technical skills - does the center provide a timely method of matching user needs to known technical resources (network of professors, suppliers, fabricators organized and accessible).
 - Encouraging collaborative efforts - does the center understand its constituency to be able to initiate collaboration on useful efforts in important areas (common auditing standards in automotive suppliers, electronic interchange efforts, etc.)
 - Marketing - are marketing efforts sufficient that if I was here I would know about this service (materials, distribution plan, measured results)
 - Overlap - are the services available elsewhere for a reasonable fee.

These are the types of analysis that the external industrial reviewer faces in daily product/service decisions. Applying the same analysis process to the manufacturing program is a reasonable expectation. For the program to establish lasting value, it must come from providing needed services to its clientele. External review is absolutely necessary in the evaluation process to emphasize this one point - provision of useful services, not just a quantity of services, is key to the value of the program.

Additional External Reviewer Formats

While on a national level, external reviewers are used to evaluate the various programs, these reviews are infrequent and provide more guidance to NIST than to the individual centers. Local centers need to have more frequent advice from their constituents - the business owner. These interactions can take several forms and in the corporate world might be akin to marketing focus groups aimed at understanding the needs of the

client community. Two means of external review that appear to be valuable to both the participants and the centers are the advisory group and the focus project.

The advisory group is an industrial board that meets monthly or quarterly with local business leaders. It should be comprised of 5-10 local businessmen that represent a cross section of the manufacturing community. It should have a two-year rotation so that the members are not there for life and so that there is some continuity (i.e., half of the members are new each year). Regular meetings between the center leadership and the advisors strengthens the center and also provides a conduit for new service ideas to flow.

Another recommended form of external interaction is the project group. Many areas have a concentration of manufacturing firms that share a particular common interest. In these areas, the center can serve as the catalyst/moderator for the assembly of project groups to focus on specific tasks of interest to the firms. Project groups should have a fixed goal (and duration). Efforts like supplier standards for a region, audit standards for an industry, electronic data interchange for a group of suppliers, worthwhile continuous improvement processes, and industry training needs can be the focus of such groups. External participants are more likely to participate if the topic is specific and the commitment focused. From these efforts, additional services that the center can offer often arise.

There is no substitute in value creation for understanding the customer. When centers exist to secure their funding instead of providing a worthwhile service, they have lived beyond their usefulness. The evaluation process must emphasize the worth of the service to the customer - the business - and the growth and value will follow. Hopefully, external reviewers provide a vantage point that emphasizes this.