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Benchmarking Manufacturing Extension Centers

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Overview

This is a discussion about an ongoing effort among Manufacturing Extension Centers (MECs) to track a set of operating measures for benchmarking themselves compared to one another. The development of the effort has been funded by the National Institute of Standards and Technology (NIST) and has been center directed and led, with staffing and operational support provided by Nexus Associates. The general findings indicate that for project activity, center field staff are meeting, on average, eight new prospects per year, developing ten-twelve new projects per year, "carrying" eighteen per year, and closing eight per year. The benchmarking suggests that centers should view their operations, from a cost perspective, as consulting-type organization for the purposes of cost management, while recognizing each centers unique operating approach and regional goals.

Background on Project Initiation

The genesis of the project was 1995 when the Northeast Directors began discussing the idea of sharing standardized operating information among themselves with the purpose of learning about one another, and developing a basis for self-improvement activities.

The group applied for NIST funding in the fall of 1995 under a competition to support MEC-based evaluation activities, with the Connecticut State Technology Extension Program, (CONN/STEP), Connecticut's MEC, as the lead MEC. The proposal included all of the Northeast MECs as well as four centers from outside the region. Centers from other regions increased the number of MEC "business models," and incorporated one center who had already achieved ISO 9000 registration.

Word was received in the summer of 1996 that the project was funded. Work began with the first meeting of the group held

in conjunction with the Northeast Regional Directors' meeting in September of 1996.

Benchmarking Among MEPs

Several of the underlying reasons for benchmarking among MECs' were to:

- Establish some shared operating parameters;
- Help focus improvement efforts using "baseline" data;
- Examine the impact of changed operating procedures on various operating parameters;
- Compare measures against other centers leading to learning what others are doing; and
- Observe what might be reasonable operating metric goals based on center experience;

Benchmarking under this project excluded comparing impact results. Since so much of the NIST effort was already directed to measuring MEC impact results, it made no sense to compete with these efforts.

Other Benchmarking Approaches

A similar effort was started by MAMTC and Paul Clay in a roughly concurrent timeframe, which is taking a straight accounting perspective on MEC metrics. In particular that group is looking at centers which use a similar operating approach, which are about the same size, and will look at issues like cash flow, balance sheets and income statements. The analogy one can draw is that the use of financial data, like the MAMTC approach, is similar to audited financial statements - while the MEC Benchmarking project is like looking at internal operating measures, such as Performance Benchmarking or High Impact Assessments do with manufacturers.

At the same time as well, NIST was rolling out their standardized monthly reporting system and semi-annual reporting system which captured data that could be used for benchmarking by centers. However, many of the centers viewed this data as suspect since data is often submitted to make an individual center look favorable. Others have commented on a number of definitional problems. And third, if the benchmarks desired were different from reporting methods, then the NIST data would be limiting.

First Steps in the Project

At the first meeting, the 14 participating centers began by defining the types of activities or processes that were most important to measure and improve. The question posed was "Without discussing actual metrics please identify the 5 major processes within your center that you would like to measure?"

The centers were broken into separate groups of 3-5 members, and asked to come up with their top five processes. The larger group re-convened and almost using the same words, the different groups proposed focusing on the same five processes: Client Development; Project Development; Project Management; Customer Impact; and, Building Customer Relations. The Customer Impact was set aside since NIST was focusing on that. The other four processes were organized in a flow diagram fashion as indicated in Diagram I.

Definition of the Four Major Processes

Develop Prospects: This is the process of meeting with manufacturers. "Manufacturers that have received an initial site visit or undertaken a project. Once a prospect, always a prospect." Prospects are eventually presented with project proposals, becoming customers. "Customers are prospects that have initiated one project with the MEC. Once a customer, always a customer."

Projects: Is work undertaken for a manufacturer according to a signed, written agreement between the customer and the MEC and/or a third-party service provider that describes the services to be delivered and

any associated budget. The project may be carried out by MEC staff and/or a third-party service provider. In either case, MEC staff must provide project management.

Manage Projects: Is the time and effort undertaken during the project under contract, this may be project support, or it may be direct contract work.

Build Customer Relations: Is looking to measure the level of repeat customers, size of project activity, and coverage in the marketplace.

One change from the original concept occurred at this point. Rather than looking at many different activities, the project focused on processes related to project development. Activities like marketing, seminars, group projects, etc. were recognized as valuable activities by MECs, however the group felt that the need to focus and achieve consensus would only be possible with one set of activities at a time.

First Conclusion

Despite the best efforts of the MECs involved, it was recognized that all of the participating MECs operated in a similar enough fashion that this project could be accomplished. While many of the participating centers declared their uniqueness, it was eventually agreed that by working together at a higher level of process analysis, all centers are "uniquely similar." There are some differences, but not enough to prevent comparisons.

Second Conclusion

Many of the measures used would be related in both inverse and converse fashions (i.e. high on one would typically result in being lower on another, or the reverse) and a specific value is related not to the performance of centers, but rather to a level that matches an individual centers philosophy or "business model." Thus the participants began to agree on processes with the recognition that no single measure could designate a high performing or low performing center, nor that "high" or "low" was a judgement possible independent of an individual centers expectations.

Next Steps

The project moved into the stage of developing specific metrics that could be associated with each of the processes. Each center was visited in the fall of 1996 to discuss what measures they currently use, what measures they might use, and how they might approach measuring any of the processes. In each case, the Director, field personnel and administrative and support people were interviewed. In addition, 21 private consulting organizations were contacted to examine their metrics for the same processes.

At a second meeting in December of 1996 proposed measures were presented and discussed in detail. This conversation resulted in numerous changes in the specific definitions, but also began to identify the concept of an MEP "Costing Rate." This thought is that if one takes all the operating costs, and divide by just the number of hours spent in project activity with companies (i.e. billable activities that you could charge for) what would the actual cost per hour be? A graphical presentation of this concept is presented as Diagram II.

In essence the processes follow a "consulting model" practice from a cost perspective. If all cost outside of the time spent with manufacturers are included in an hourly cost rate, MECs at this point "cost" $200-$400 per hour of time spent with clients. This is the same thought process which drives larger consulting groups to actually bill out at $400 per hour.

Third Conclusion

What became evident early on is that many of the efficiency measures would be based on tracking time, particularly a break out between time spent on projects, compared to all other time. In at least 50%

of the centers, this was not already being done to the level necessary for benchmarking purposes. Most centers tracked time on a weekly basis, several centers tracked time across publicly supported programs or contracts, but very few tracked time or differentiated time spent on companies or company projects versus other activities.

For several centers the issue of further participation in the project centered around whether they were willing to begin tracking the field staff time by hours against individual companies and company projects. In several cases, the centers were moving in that direction already, and this became a driver for helping the center to see more rationale for instituting a clear policy, and provided guidance for a reasonable approach.

Pilot Testing

A pilot test was run during the month of January, 1997 using the agreed to measures. A third meeting was held in Boston in February, 1997 resulting in revised measures, data definitions and collection approaches to be put in place for the full quarter.

The First and Second Report

The first full report was generated based on the first quarter of 1997, January to March. Reports were returned to centers by early summer. The report is a confidential release of information for every center, with a code key established for individual centers - they know who they are, but not anyone else. Yet everyone has access to everyone else's data. Each of the centers were then visited in July, as they were completing the submission of their second quarter data, and debriefed on the first report.

One lesson learned from the visits was that centers were particularly interested in tracking their quarterly performance. The original idea was to compare benchmark data every six months. Yet quarterly data for self analysis turned out to be of most interest. A quarter is a short enough period that problems could be responded to, yet long enough that "noise" evident from monthly data would not be confusing. Centers commented that comparison would be helpful computed once a year.

A second report was produced in August 1997, and a meeting held in Boston in early September 1997 where the participating centers together reviewed the results of the two quarters of data. At this meeting each of the centers began to share their "coding" so that everyone was identifiable to everyone else. A very healthy discussion occurred among centers based on these results, particularly those centers that had "outlier" metrics on the scales. Also discussed was how the data was being used by the center for planning, base-lining and performance improvements.

Measurements Selected

The following measures were recommended by the group for use by MEPs in gauging their business processes:

Overall

- Percent of total "available hours" charged to projects;
- Total operating costs per project hour;

Prospect Development

- New Prospects per Field Staff
- "Conversion Rate" of Prospects to Customers

Project Development

- Number of new Customers per Field Staff
- Number of new Projects per Field Staff

Project Management

- Percent of Field Staff "available hours" charged to projects
- Active projects per Field Staff
- Average Hours spent per project in period
- Number of completed projects

- Number of open projects

Financial

- Total operating costs per Field Staff
- Gross Cash received from clients per Field Staff
- Payments to outside parties per Field Staff
- Net Cash received from clients per Field Staff

Numerical Findings

There are several preliminary findings regarding the level of activities through the first two quarters of the project:

Average New Customers

The average number of new customers per field staff person is typically around 2-3 per quarter. However, the range of number of prospects visited by field staff ranges from 2 to about 10, with the median or mean approximately 7. The conversion rate ranges from just under 0.1 to just over 0.6, in almost an inverse relationship to the number of prospects visited. Thus, centers who have visited 11 prospects, have a conversion rate of 0.2 (this a new customer rate of 2) and centers who have visited 3 prospects, have a conversion rate of 0.6 (thus a new customer rate of just under 2). This represents various marketing strategies, and represents that there are trade-offs among these strategies.

Project Development and Management

The rate of project development, management and closure is farily similar across the participating centers. On average, field staff are developing 8 new customers per year, 12-14 new projects per year, "carrying" 18-20 as active through various parts of the year, closing 8-10 per year. Thus, most field staff are developing more projects than they are closing at this point.

Financial Measures

Most centers, 75%, have moved from a position of subsidizing services to one of generating positive cash flow on a project basis. This may in fact be due to billing and collecting methods versus true cash flow, which would become evident through future quarters.

Additional Lessons Learned

Fourth Conclusion

Getting buy-in an a level which results in true participation is difficult. First the center director needs to agree, then you need 1-2 other champions within the center to ensure real follow through and support on the operating level. During the project, approximately 70% of the centers changed directors, yet there was strong continuity in the project since most of the data collection and understanding was developing at the next "level" down. In several cases, the new director benefited from the reports as a means of getting good, quick operating information about the center, and what a center is!

Fifth Conclusion

It was easy to get participation from centers for the initial pilot test, and for the first full quarter program. It is much harder to build a sustained commitment and understanding for something like this that: requires data input by a center (i.e. time and effort); happens only four times a year; does not represent a requirement by a funding agency; and, doesn't affect the field staff directly.

The main way this was overcome, was to build into the process several meetings on-site at the centers to reach out for their input, and to meet with the directors and other staff members so that the results and their use were made clearer to the participants. A significant training activity

will be an imperative for any new center interested in participating.

Sixth Conclusion

What might be termed the "process of discovery" was particularly important to the centers in the project. As opposed to simply being given the data collection requirement, and the measures to review, the whole process of getting together on a regular basis (perhaps twice a year as a group) to discuss the consulting model perspective, to discuss the use of particular measures, and to discuss how the results of these projects or programs are used, was as important as the numbers. Several centers gained a true perspective on how to begin viewing, managing and supporting their operations from this activity.

Seventh Conclusion

Of particular importance to the group was the role that NIST played, and didn't play during the project. NIST provided the funding, and was involved in helping to set up the initial measures. NIST wanted to use any currently collected data if possible, to help limit the amount of extra data collection. Second, NIST has a tremendous amount of experience from the quarterly and semi-annual report process about issues and dilemmas in the collection and use of data and measures.

There was a tremendous amount of concern about whether NIST would be involved in holding or reviewing the actual center data and measures. NIST was very supportive in letting the project be directed by the Centers, letting the project information reside with a third party (Nexus Associates) and not requiring access to the center codes. This, in spite of what one NIST Regional Manager pointed out, that based on information already at NIST they could see many of the same things that Centers might discover on their own.However, the fact that NIST does not hold the data, or know who the data is about seems to have allowed for a fuller exchange between the centers.

Final Perspectives

The project continues with the original group focused on reviewing a full year of data, and looking at ways to expand the project to other centers. Several centers have begun to use the results in discussion with their boards, with their staff and with their state sponsors. In addition to creating a descriptive "model" to share, the actual data is being used to establish baseline data for leading improvement efforts.

It is clear that the way centers can improve the cost of their efficiencies follows some of the typical consulting strategies. These include using "lower cost" staff, strengthen external marketing efforts to maximize field staff time in projects, etc. Also, several "trade offs" that are intuitive have been clarified: the affect of client work versus meeting with prospects; leading indicators for projects that can be tracked; the difference in many metrics or measures among "business models" is there, but not as dramatic as might be expected.

Based on the project several centers have established much stronger data collection and management systems, particularly focusing on client relations and time worked with clients. While the study or results didn't always uncover unknown information for an individual center, it helped to verify and clarify problems, and show the impact that a problem might have on other operating factors.

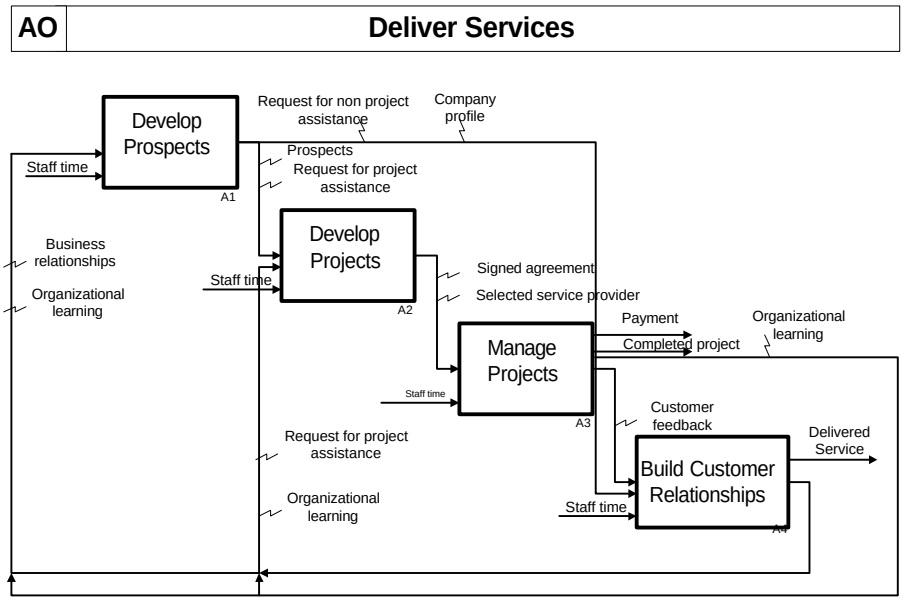

Diagram I

Staff spend time on direct and indirect activities … but only billed time generates revenue

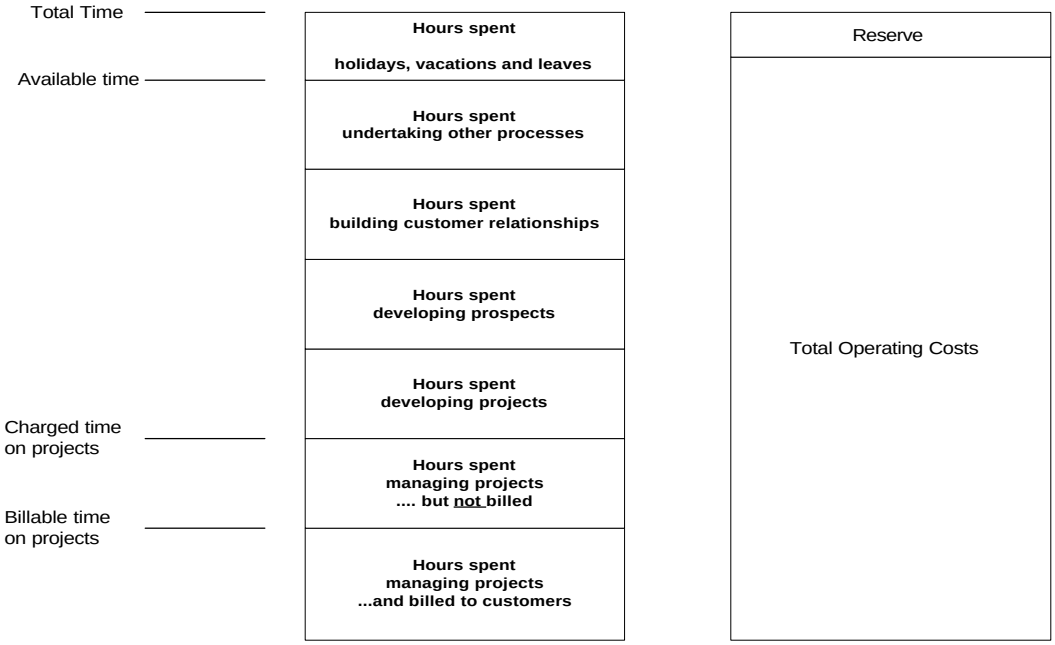

Diagram II