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MEP Advisory Board Performance & Research Development Working Group:

Performance Framework Final Report

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Introduction and Background

The NIST MEP Advisory Board created a Performance and Research Development Working Group[1] in January 2018. The Working Group was charged with focusing on the issue of performance measurement and management, evaluation, and research to support the MEP National Network™. The Working Group focused on providing input and guidance on the performance evaluation and Program performance measurement processes of the MEP National Network™. This report is intended to lead to improved Center evaluation processes and approaches, the promotion of National Network learning, and improving the portfolio of NIST MEP data and analysis services for Centers. Through this effort, the Working Group is providing feedback and suggestions on supporting and enhancing NIST MEP's performance and evaluation systems including research to leverage and enrich NIST MEP's performance and evaluation management system.

The Working Group met several times over the course of its work. This document summarizes the findings, observations, and recommendations of the Working Group to the MEP Advisory Board. These findings are based on the Working Group's review of the information and data NIST MEP collects, its performance measurement and evaluation portfolio, and the new Panel Review process. The working group also examined Network performance results, Center and Network performance trends, other external reviews of the MEP performance measurement,

[1]The Working Group was led by Leslie Taito and its members included: Jose Anaya, Carolyn Cason, Joe Eddy, Kathay Rennels, and Jim Wright. Bernadine Hawes and Jeff Wilcox were Ex-Officio members of the working group. The Working Group was supported by Kenneth Voytek and Chancy Lyford.

management approach[2], and potential new approaches to performance improvement.

Observations

The Working Group is impressed with the strong and robust foundation the NIST MEP Program has established to collect and use information to assess Network and Center performance. The effort and resources NIST MEP have devoted to performance measurement and evaluation is impressive. This has been a consistent and important focus for the program since it was created more than 30 years ago. A listing of some but not all studies is included Appendix A to this memo. The focus on performance has guided the program since its inception and demonstrates it has made a positive impact on the Program and Centers. Much of the information and studies conducted by NIST MEP over the years has served as the foundation to show the Program makes a meaningful difference not only for the clients it serves but has broader economic benefits that extend beyond positive client outcomes.

The Working Group finds one of the distinctive strengths of the NIST MEP Program through the years has been its consistent focus on measuring Program performance and impacts, demonstrating accountability to stakeholders and leading to improved Program and Center performance. The Program relies on a range of tools and approaches measuring Program

[2] These reports include NIST MEP (1999) *A Report to Congress - The NIST Manufacturing Extension Partnership: A Network for Success*, National Academy of Public Administration (2004) *The Manufacturing Extension Partnership Program: Alternative Business Models*, Stone & Associates and the Center for Regional Economic Competitiveness (2010), *Re-examining the Manufacturing Extension Partnership Business Model*, and the National Academies of Science (2014) *21st Century Manufacturing: The Role of the Manufacturing Extension Partnership Program.*

performance including administrative data on clients served, what services are provided, and the results of these services including the following:

- The NIST MEP client impact survey collects information on the impact of the program regarding sales, jobs, investments, and cost savings, which are keystones of the Program. This information is valuable to understand how the services delivered improve client performance and what services and methods should be used more extensively by the Program.

- The Working Group observed the current IMPACT metrics report consists of important quantitative measures of performance and a provides a consistent approach to examining Center performance. The IMPACT metrics cover many of the key aspects of performance including impact and market penetration and provide for Center to Center comparisons as well as trend information. The Working Group suggests that additional tools and information would provide MEP Centers with additional opportunities for benchmarking and performance improvement. The Working Group explored how performance across the MEP National Network had improved over time after the new IMPACT metrics were implemented.

- The new Panel Review process and report that focuses on performance trends of a Center. The Working Group found that the revised Panel Review process, put in the statute in the American Competitiveness and Innovation Act of 2017, is an important change as it places the primary focus of the Review on impacts and results and those factors that may be associated with improved results and impacts. This evolution of the Panel Review process and its focus on performance and results should continue. and elements such as Annual Center Reviews should be aligned to focus on the same issues.

- The Program has also periodically undertaken formal impact evaluations that involve comparing the performance of MEP clients to non-clients and has used the results to inform program strategies and objectives. Continued comparative analysis would be informative and doing such studies should continue.

The mix of methods used by the program to assess performance has been necessary and valuable to the Program and Centers based on the Working Group's review. By focusing on economic impact, the Program and the National Network are focused on ensuring that its activities are improving the competitiveness and productivity of U.S. small- and medium-sized

manufacturing firms and are also having broader economic impacts.[3] However, the Working Group observed that additional tools and information would provide MEP Centers with additional opportunities for benchmarking and performance improvement. Areas of focus for the Working Group's analysis included:

- *Understanding the Influence of Metrics on Center Performance:* The Working Group explored how performance across the MEP National Network™ had improved over time when the new IMPACT metrics were implemented. The IMPACT metrics report and the revised Panel Review process reflects the in-depth and on-going revisions of the reporting and performance measurement system.

- *Identifying the Factors Most Important to Predicting Center Success*: The focus of the Panel Reviews on Center Performance and trends in performance over time and the factors that correlate with or high or low performance is encouraging. The Working Group encourages NIST MEP Panel Review's to evolve and sharpen its focus on the factors most relevant and important to performance.

The Working Group defines performance management as including the activities, decisions and processes, and strategies that affect performance and incorporating this perspective into the Panel Review process is important. This may include more systematic research addressed below. The performance measurement and management approach of NIST MEP serves as a model for technology based economic development programs and is firmly established within the MEP National Network™ and it is widely accepted and expected by NIST MEP stakeholders. This is evidenced by the studies cited earlier that reviewed the performance and evaluation approach used by NIST MEP and other external reviews including studies appearing in peer reviewed journals.

[3] See, for instance, Robey, J. et al. (2018). *The National-Level Economic Impact of the Manufacturing Extension Partnership (MEP): Estimates for Fiscal Year 2017.* W.E. Upjohn Institute for Employment for Employment Research.

Continuous Improvement in Performance Management

Understanding Center performance and the factors distinguishing high- and low-performing Centers is fundamental to Center and Program management and will require discovering how organizational practices, policies, and other factors come together to determine performance. It is not enough to diagnose or examine organizational performance, but the Program also needs to examine why an organization performs as it does. If the Program can come to understand these underpinnings of performance, NIST MEP can begin to develop prescriptions for improving performance. The Working Group believes this could be addressed by examining the effect of organizational structure, strategies, resources, service models, external environment factors, and internal factors including management practices and behaviors on Center performance.

Leveraging information to enhance learning and linking the information and data to users in innovative ways will be critical to the long-term health and vitality of the Program. NIST MEP should also continually seek new means of facilitating MEP National Network™ and Center learning to improve performance. This will involve more than just collecting information-- the information collected by NIST MEP needs to be leveraged by Centers and linked to other initiatives. The Working Group believes that this information represents a competitive advantage the Program can leverage in new and different ways. The working encourages the Program to focus some of its resources to collect, analyze, and report data and information relevant to NIST MEP management, Centers, stakeholders and other partners. This will continue to grow as the Program evolves in response to changes in the manufacturing landscape and resulting alterations in client needs.

Over time, this may involve new approaches and methods for evaluating and measuring the impact of the MEP National Network™ and Center performance. The Working Group

recommends that the Program also continue to evolve its performance measurement approach in the following ways:

- The Working Group strongly encourages NIST MEP to continue to work in concert with the Centers and other stakeholders to refine its performance measurement approach.

- The Working Group recommends that NIST MEP implement and introduce revisions in a thoughtful and measured manner as appropriate. Measures matter.

- Finally, the Program should ensure that the performance measures in place do not have unintended consequences and that the burden on the Centers and clients is minimized to the extent practical.

Embracing performance management best-practices requires that both NIST MEP and Center management use performance data and information to help them make decisions with the aim of continually improving services to manufacturers and Center performance. This may mean training and assisting Centers to be more sophisticated consumers of data and to use and incorporate data and analysis into their decision-making process. Also, the Working Group believes a renewed focus by NIST MEP on data as a service may be a starting place. This may include building out the range of data services and reports that Centers can access and use.

Recommendations for Research and Development

The Working Group identified a set of research topics and ideas for the MEP Advisory Board to consider going forward. The Working Group grouped these topics into three areas. The first is focused on supporting NIST MEP and the National Network to improve performance. This research may help guide the transformation of the National Network and leverage partnerships. The second set of topics is focused on the broader manufacturing landscape to enhance the National Network as a champion for manufacturing and a thought leader as well as empowering manufacturers. The third set of topics is focused on ensuring that

NIST MEP supports and builds out the infrastructure to support research and evaluation efforts. We recognize that each of these is a significant undertaking, but we view these as setting out a longer-term research program strategy for the program.

The Performance and Research Development Working Group provides the following recommendations to the MEP Advisory Board.

Research on NIST MEP

- ***Undertake research on the factors related to differences in center performance.*** The Panel Review is currently based on a set of hypotheses about factors that relate to high or low Center performance, but we have not determined which factors do account for high or low Center performance or how they interrelate. This research would give NIST MEP, panelists, and Center management a tool to benchmark best in class along with identifying the key drivers of success (i.e., staffing talent/experience, financial impact of Federal and state funding, funding by stakeholders and/or interested parties and partners) that can be utilized in future planning and training.

- ***A more nuanced view of Center performance including not just a focus on minimum but to distinguish levels of performance.*** This research will provide a more detailed analysis and a picture of Center performance across the National Network and permit centers and managers to distinguish themselves among Centers in terms of high performance. This will also provide Centers and stakeholders with the ability to evaluate and analyze performance based on criteria that is not merely pass/fail but generates guidance and information to determining strategic areas for improvement, development and growth.

- ***Expand the use of case studies and other approaches to examine pilot programs and new services.*** NIST MEP is rolling out new and innovative experimental services, and when the special funding ceases, the new service or program does not become sustainable and ceases as well. Having the opportunity to systematically analyze how these pilots and new services were rolled out to discover what lessons learned that can be applied to other initiatives is important. This may help NIST MEP and program managers measure whether the pilot programs can be replicated, how the programs evolved, and the factors that enabled sustainability, and ultimately success.

- ***Research on the factors that relate to the level and likelihood of MEP clients reporting impacts.*** Centers and staff have often asked what types of projects lead to better outcomes and what types of outcomes can be expected from different services. This will provide a deeper level of understanding to NIST MEP and allow Center management to

have predictive elements when reviewing current services and creating new program offerings. This will provide Centers with better intelligence on those services that make the most difference to clients and what they can expect. We also encourage the Board to suggest NIST MEP continue to focus on long-term longitudinal formal impact evaluations to provide additional information on program outcomes.

Research on the Manufacturing Landscape

- ***Research on underserved segments of the manufacturing marketplace.*** The MEP National Network needs to work with more manufacturers, including those underserved in terms of location (such as economically-disadvantaged areas), size (micro manufacturers), start-ups, and veteran, minority, and woman-owned businesses. This research should include understanding types of services needed by underserved manufacturer populations (i.e., strategy, markets, technology, business continuity) and how the National Network can fashion programs and services to better reach out to and serve these segments. This would expand market penetration.

- ***Mapping and defining the Manufacturing Ecosystem/Industrial Commons.*** Identification of MEP Center ecosystems will highlight successful models (University-based, stand-alone) and the integration and linkages to economic development organizations and programs of each helping to drive that success. Focus should also be on the relationships with advanced manufacturing groups such as universities and federal labs, Manufacturing USA Institutes and industry-specific trade associations to deliver high value services and nurture a system that develops a strong ecosystem to support manufacturing. The ecosystem includes both the hard and soft infrastructure that supports manufacturing and is a way to coalesce a region's institutions and actors around their shared goals such as strengthening manufacturing by increase research and development, skills and workforce development, and building out and strengthening connections among suppliers and other support services.

- ***More research into the broader economic and business environment faced by manufacturers*.** This research can include looking at trends and changes in manufacturing in the US and across states and regions. Understanding the manufacturing environment may also include focusing on other emerging trends regarding new business models, technologies, and what they mean for SMMs and MEP Centers. This could be supplemented with information gathered in MEP surveys and potentially creating a panel of manufacturers to use for special surveys, etc. This may also help to identify emerging issues that may lead to targeted approaches for system services along with options for new programs and service delivery models.

- ***Supply Chain Assistance*.** Supply chain assistance has been an episodic focus of MEP. NIST MEP and the National Network should convene research and other analysis to better understand how to identify supply chains beyond Tier 1 and 2 in different industry

verticals to better make the case to stakeholders and OEMs that SMMs are critical links in supply chains for U.S. based OEMs. Better optics, definition, and identification of particular supply chains would enable national and global supply chains participants to have the ability to identify and participate in the long-term sustainability of supply chain services and partners. This would improve the targeting and delivery of services to clients to optimize and improve supply chain performance. This could be another way to expand MEP market penetration leading to more clients and impacts. In addition, NIST MEP might consider what is needed to develop a business model that could create a sustainable supply chain practice across the National Network and how a supply chain practice could be deployed and sustained.

Supporting Research and Evaluation

- ***Broaden the bench of researchers focusing on manufacturing (particularly SMMs) and MEP Program.*** MEP should broaden and encourage a new generation of researchers and scholars to focus on issues relevant to MEP. This will aid NIST MEP and National Network a true champion for manufacturing. This could include collaborating with graduate students and post docs for example. NIST MEP should seek to make its data and access to the National Network an incentive to researchers and scholars for their research projects or projects mutually defined. NIST MEP should also investigate leveraging think tanks and industry associations to broaden the messaging, scope, and research into manufacturing and MEP. Also, the Working groups encourages NIST MEP to make the resources and investments available to support a robust research and evaluation agenda.

Conclusion

The Working Group applauds NIST MEP on its commitment to evaluation and research over the Program's existence. The performance measurement and evaluation system, including the Panel Reviews and its focus on performance, represents a model for government and business assistance programs. The NIST MEP and the National Network has leveraged the data and its approach to demonstrate and document that it delivers measurable results. A commitment to a robust research agenda both on NIST MEP, manufacturing extension, and manufacturing generally is a useful exercise to think through and deploy. While we have made recommendations for the Program to consider, we also recognize that the Program should be

agile and careful in setting out its research and evaluation agenda. The Program should plan its agenda to ensure it can respond to new and unforeseen issues that may emerge.

Appendix A: Selected Studies on MEP

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