

The background features a stylized industrial scene with a large orange gear, a yellow sun-like circle, and a building with a red crane. The text is overlaid on these elements.

*Evaluation
and Economic Impact of the*

**Montana
Manufacturing
Extension
Center**

2013

BY
Paul Polzin, Emeritus Director
Bureau of Business and Economic Research

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1. Executive Summary

The Montana Manufacturing Extension Center (MMEC) works with manufacturers to create and retain jobs, innovate, reduce costs, increase profits, and save time and money.

MMEC employees usually make on-site visits to manufacturing clients to assess the problems and suggest appropriate solutions and assist with implementation. MMEC closely monitors its performance by welcoming feedback and carefully following an evaluation procedure developed by the National Institute of Standards and Technology (NIST). Clients are surveyed each year about their satisfaction with the services they received. These respondents are also asked to quantify certain economic impacts and outcomes associated with MMEC visits. This report summarizes the responses received from MMEC visits during 2012.

NIST has developed a standardized questionnaire and specifies when manufacturing clients are to be interviewed. This is the fourth year that this updated evaluation procedure has been used to gather the data. Responses may now be exactly compared for the entire 2009 to 2012 period. Following are the survey findings:

Montana manufacturing clients were very satisfied and would be very likely to recommend MMEC to other firms.

Many (48 percent) said they relied exclusively on MMEC, but a growing percentage said they were using additional providers of business performance services.

The professionalism and knowledge of the MMEC staff was identified as a major strength of the center and many of the evaluations enthusiastically mentioned specific staff members.

The most important challenges facing the clients were ongoing continuous improvement/cost reduction strategies and identifying growth opportunities.

The slowly improving business cycle may be affecting some of the perceived challenges mentioned by MMEC clients. The two above were mentioned far more often in 2012 than in 2011, suggesting that traditional challenges associated with cost reductions and finding growing markets are becoming more important.

The most important outcomes of the MMEC visits were investment in workforce, or employee skills, increased sales, and investment in plant and equipment.

The “Great Recession” and its ragged recovery impacted the trend in outcomes of MMEC visits; respondents reported overall growth in most categories but there was significant volatility.

MMEC visits during 2012 resulted in 440 new and retained manufacturing jobs and directly or indirectly added approximately \$2,063,683 in Montana Individual Income Tax revenue.

For the first time in 2012, the NIST survey asked about the proportion of new and retained sales that could be attributable to new customers, markets, products and services. The figure for new sales was roughly 67 percent and the corresponding figure to retained sales was 4 percent.

The Montana return of investment (ROI) for MMEC during 2012 was 10.3 to 1; the state received about \$10.30 in income tax revenue for each dollar invested in MMEC.

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2. Montana Manufacturing Extension Center

The Montana Manufacturing Extension Center (MMEC) is the state's affiliate to the National Institute of Standards and Technology (NIST) Hollings Manufacturing Extension Partnership. The mission of MMEC is to work with Montana manufacturers to create and retain jobs, accelerate innovation, increase profits, and save time and money.

MMEC provides a variety of services—from innovation strategies to process improvements—and works with manufacturers to develop new customers, create new products, and expand into new markets.

MMEC is located within the College of Engineering at Montana State University-Bozeman. The MMEC director and the administrative offices are located in Bozeman. There are five field offices across the state: Missoula, Kalispell, Helena, Billings, and Bozeman. Each office is staffed by a field engineer who works directly with the manufacturing clients in the area.

The core strength of MMEC is its employees. They are experienced, committed to Montana, and knowledgeable about all aspects of manufacturing. MMEC field engineers interact directly with manufacturing clients and bring a wealth of expertise,

tools, and techniques to help solve the production, technical, and management issues facing companies today. During this period staffing included an E3 specialist and through a collaboration with the Montana Department of Commerce, a B2B Business Development specialist. MMEC specialists travel to the manufacturing workplace to observe and evaluate the problems and then collaborate with management and staff to develop workable, cost-effective solutions consistent with the company goals. Clients are also referred to additional business services.

MMEC hosts a "Compete Smart" statewide biennial conference for manufacturers and other interested parties, which offers an opportunity for learning and networking with peers, suppliers, and colleagues. This conference also showcases many diverse manufactured goods from across Montana.

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3. The Evaluation Process

The MMEC evaluation process follows the guidelines developed by NIST as part of its management information reporting procedures. The evaluation is conducted by an independent analyst. NIST specifies the timing of the evaluation and provides a standardized questionnaire be distributed to manufacturing firms served by MMEC.

These manufacturing clients are asked to evaluate the effectiveness of MMEC and to quantify the economic impact of MMEC's activities on their business and the Montana economy. MMEC received 52 responses during 2012 evaluation period. After careful review, ten were judged to be incomplete or otherwise unusable because of the large number of questions unanswered. Consequently, there were 42 questionnaires representing completed projects during 2012.

This is the fourth year that the evaluation process utilized the same questionnaire and timing. Data from the 2009, 2010 and 2011 evaluations are presented in many of the following tables. This allows identification and analysis of trends in the evaluation metrics. In addition, there were several additional items added to the 2012 questionnaire. The responses were tabulated and are reported in a separate table.

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4. Overall Satisfaction and Client Comments

Manufacturing clients said they relied heavily on MMEC and were very satisfied with the services received. Approximately 48 percent of the respondents said they relied exclusively on MMEC and did not consult with any other provider of business performance services.

There is a strong trend, however, toward using additional providers. The percentage of respondents who said they relied only on MMEC dropped from 68 percent to 48 percent from 2009 to 2012 (Table 1).

Montana manufacturers were asked if they would recommend MMEC to other potential clients (Table 2). They were asked to rate the likelihood of a positive recommendation, with 1 being the least likely and 10 being the most likely. About 76 percent of the 2012 respondents chose 10 (the most likely), approximately 10 percent chose 9, and 7 percent chose 8. Only 5 percent of the respondents chose a value of 7 and 2 percent chose 6 or less.

The Net Promoter Score (NPS) is calculated by subtracting the percentage of respondents choosing 1 to 6 from the percentage choosing 9 and 10. MMEC's 2012 NPS equals 84 (86% - 2% = 84). The NPS values for 2009 to 2011 were

78, 83, and 84, respectively. Therefore, there has been a slight upward trend in MMEC's NPS score during the past four years.

The NIST questionnaire provides a number of opportunities for Montana manufacturers to provide suggestions and comments to MMEC. These responses were edited slightly to preserve anonymity and grouped by topic. They are presented in Table 3. These comments are overwhelmingly complimentary and those about the professionalism and abilities of the MMEC staff verify the findings reported in the next section concerning the primary reason why clients chose MMEC. As in the past, respondents made several specific suggestions concerning ways in which MMEC may further tailor its services in the future.

Table 1
Have You Used Any Other Extended Providers for Business Performance Services?

Year	Yes	No	No Response
2009	32%	68%	0
2010	36%	62%	2%
2011	42%	58%	0
2012	52%	48%	0

Table 2
How Likely Would You Be to Recommend MMEC to Other Clients?

Year	1	2	3	4	5	6	7	8	9	10
2009	-	3%	-	-	3%	-	-	10%	18%	66%
2010	-	-	-	-	2%	2%	4%	4%	17%	71%
2011	-	-	-	-	-	-	2%	14%	12%	72%
2012	-	-	-	-	2%	0	5%	7%	10%	76%

Table 3
What Clients Said About MMEC

Professionalism and Relevance

MMEC is a pleasure to work with and provides an invaluable service to companies in Montana

Great group to work with very knowledgeable

Great program.....I believe Montana is fortunate to have these high quality services available and presented by such competent and professional staff!

Excellent programs and personnel. First class.

Just gratitude. Marketing has always been the biggest challenge for us. Keep the information on marketing flowing!

I did not reference specific financial impacts as the services provided by MMEC were in conjunction with other services expense reduction efforts and investment efforts. The services provided were instrumental in pulling the team together getting everyone on the same page and increasing our focus on the need to continually improve our organization.

Keep up the good work

Did a very good job

Keep up the great work! Our company will be needing your services more and more as we continue to grow and seek to become more competitive and sustainable.

Don't change!

Training and Certification

It is a great program. They helped us get AS9100 certification successfully at a very low cost compared to 75000 by other private firms.

Thanks very much for your help. MMEC has helped us select and retain competent manufacturers and to navigate the CE certification process.

Knowledable and Helpful Employees

Our benefit from investing in Dale and MMEC has been ongoing since our first lean class several years ago. Our continuous improvement practices keeps us moving in the right direction. We keep Dale on so he can visit several times a year and keep us on track.

We were very thankful for the help Todd Daniels provided. We couldn't have done it without him

Leesa has been very helpful for marketing discussions.

Outstanding team

MMEC's help has been vital to the tremendous success we've experienced over the last seven years. I hope to work with them again in the future! Thanks Mark and to all who have helped us!

It actually helped us save in hiring an extra employee. We were able to put the lean manufacturing steps in and increased our production eliminating one position.

Suggestions for MMEC

Keep working hard on improving your ability to help the industrial food processing industry in Montana! Thanks again for all the help!

The only suggestion that comes to mind would be my concern that not enough people know that you exist in order to take advantage of your services. It seems that any manufacturer would love these services if they know they are available. Businesses in our community need to know you exist. The people the services the seminars have all been outstanding. MMEC is a community asset to be certain.

Need to get someone to consolidate & identify and recommend tax and business support programs available thru SBA Commerce Dept., Rural develop, etc There is a no one place to go for this info.

Our buyout has influenced my answers here. It was a 12 month period of change and directed by our corporate offices.

5. Choosing MMEC

The NIST questionnaire provided eight reasons for choosing MMEC, and the respondents were asked to identify the two most important (Table 4). About 71 percent of the respondents mentioned the expertise of MMEC as the most important reason, the highest figure by far.

Approximately 33 percent mentioned the reputation for results, and 26 percent mentioned the cost/price of services and knowledge of the industry. The least mentioned reasons were the lack of other providers and the unavailability of service, the former mentioned by only 2 percent of the respondents and the latter by 12 percent.

The 2012 findings are very similar to those for 2009 to 2011. The rank orderings of the reasons for choosing MMEC have remained relatively constant, with only a switching of second and third place in 2011. There does appear to be some volatility in percent mentioning staff expertise, but this reason remains solidly in first place during all four years.

Table 4
Important Factors for Your Firm Choosing MMEC

Factor	Percent Mentioning...				Order
	2009	2010	2011	2012	
Staff Expertise	55	81	62	71	1
Cost/Price of Services	32	28	29	26	3
Reputation for Results	29	26	33	33	2
Fair and Unbiased Advice/Services	34	19	22	19	5
Knowledge of Your Industry	16	11	18	26	4
Lack of Other Providers Nearby	7	9	7	2	7
Specific Services Not Otherwise Available	16	6	7	12	6
Sustainability in Products and Processes	18	13	24	14	4
Technology Needs	16	8	4	10	8

6. Future Challenges

The NIST questionnaire provided two opportunities for the respondents to identify future challenges they may face. There were nine categorical options presented in the survey, and the respondents were asked to pick the three most important facing their firm.

As shown in Table 5, the most often mentioned future challenges were ongoing continuous improvement/cost reduction strategies (69 percent) and identifying growth opportunities (64 percent). The least often mentioned were technology needs (10 percent) and managing partners and suppliers (10 percent).

Comparing the 2012 findings with those for the earlier years reveals some interesting trends. Even though the rank order of the top challenges was relatively unaffected, there were sizable increases in the percent of respondents mentioning continuous improvement/cost reduction (51 to 69 percent), identifying growth opportunities (40 to 64 percent), product innovation/development (49 to 59 percent) and employee recruitment and retention (20 to 33 percent). On the other hand, there was a sizable reduction in the mentions of managing partners and suppliers (24 to 10 percent). These trends

may mean that the respondents believe that they are well into the recovery phase of the business cycle, and the traditional challenges of reducing costs and finding growth area are once again important.

The NIST questionnaire also provided an open-ended question that allowed each respondent to identify challenges not on the list. Unlike previous years, the respondents provided no additional challenges.

Table 5
Important Future Challenges Facing Your Business

Challenge	Percent Mentioning...				Order
	2009	2010	2011	2012	
Ongoing Continuous Improvement/Cost Reduction Strategies	61	66	51	69	1
Product Innovation/Development	53	51	49	59	3
Identifying Growth Opportunities	42	47	40	64	2
Employee Recruitment and Retention	29	30	20	33	6
Financing	26	23	16	12	5
Exporting/ Global Engagement	17	19	9	12	6
Managing Partners and Suppliers	11	15	25	10	7
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6. Outcomes of MMEC Visits and services

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on the NIST questionnaire, and Montana manufacturers were asked which were experienced by their firm. The most reported outcome was increased investment in workforce or employee skills (65 percent). Second place was a tie between increased investment in plant or equipment and increased sales (both at 60 percent). There were two other outcomes identified by more than one-half of the respondents; cost savings realized (57 percent) and retaining otherwise lost jobs (55 percent).

Comparing the responses over the 2009 to 2012 period reveals only relatively small changes in rank order. But some of the detailed trends may be associated with the business cycle. For example, there was a sizable increase in percent mentioning sales growth – which is consistent with recovering economy.

The NIST survey asked Montana manufacturers to quantify certain outcomes of the MMEC visit. They were asked the amounts of cost savings, new and retained sales, and capital and workforce investments. Trend analysis of the quantitative estimates is valid only beginning with 2009 because that was the year when the wording of the questions and the timing of the survey were standardized. The top four rows of Table 7 present information from 2008 to 2012 for broad categories of outcomes.

The 2012 NIST survey was the fourth year that identical questions and timing were used to query Montana manufacturers. The lower four rows of Table 7 present the responses for five categories of investments related to the MMEC visit. These figures are exactly comparable from one year to the next.

* In 2010, 2011, and 2012, a review of the estimates revealed that certain categories were dominated by a few (very

large) responses. These few responses can skew time series analysis and obscure long-run trends. Consequently, there are two entries for each category during 2010, 2011 and 2012.

2011, and 2012 the edited figures generally displayed an upward trend, but there is significant volatility as shown by the alternating increases and decreases in several categories. Overall, however, in every category except cost savings, the trends in the edited entries from 2009 to 2012 are upward.

Detailed data for the amounts of capital and workforce investments are presented in the bottom five rows in Table 7. The trends in four of the five categories show overall growth between 2009 and 2012. Investment in information systems and software was the only exception. However, there was considerable volatility in each of the growing categories, with decreases during some years.

MMEC clients were queried about the number of new jobs created and the number of jobs retained as a result of the visit. The 2012 respondents said that there were 77 new jobs created and 363 jobs retained for a total of 440 jobs. The preliminary data suggest that average wages for Montana manufacturing jobs was about \$43,100 in 2012. Total wages associated with the new and retained jobs were approximately \$18,964,000 (440 X \$43,100 = \$18,964,000). Using an average tax rate of 4.0 percent, the new and retained workers paid approximately \$785,600 (\$18,964,000 X .04 = \$785,600) in Montana Individual Income Taxes.

The Montana Department of Labor and Industry estimates that the employment multiplier of manufacturing is 3.58. This is interpreted as saying that about 2.58 new jobs are created in other sectors as a result of one new manufacturing job. This agency also reports that the wage multiplier is 2.72, which suggests that an additional \$1.72 in wages is created elsewhere in the Montana economy for \$1.00 in new manufacturing wages.

Calculations based on the employment and wage

Table 1
Have You Used Any Other Extended Providers for Business Performance Services?

Year	Yes	No	No Response
2009	32%	68%	0

multipliers are reported in Table 8. The 440 new and retained jobs associated with MMEC visits in 2012 led to a total of 1,575 ($440 \times 3.58 = 1,575$) new jobs in Montana and approximately \$51,582,080 ($\$18,964,000 \times 2.72 = \$51,582,080$) in statewide wages. These additional wages generated roughly \$2,063,283 ($\$51,582,080 \times .04 = \$2,063,283$) in Montana Individual Income Tax revenue.

A new question was added to the 2012 NIST survey.

For the first time respondents were queried about the market outcomes of MMEC visits. Specifically, they were asked whether or not the MMEC visit led to (1) new customers, (2) markets, (3) new products, (4) new services and (5) increased investment in new products and process. These responses are presented in Table 9.

Approximately 57 percent of the MMEC clients said that the visit led to increased investment in new products

Choosing MMEC

frequent response was new markets, which was mentioned by 36 percent of the respondents. The least mentioned was that MMEC services led to new services (5 percent).

The respondents were also asked to report the estimated percentages of new and retained sales that could be attributed to market responses and the amount of new investment in new products or processes. The reported percentages were used to estimate the amount of new and retained sales in each for each respondent. These amounts are reported in Table 10.

The respondents said that the MMEC visit led to approximately \$2,071,830 in increased investment in new

Outcome	Percent of Respondents Mentioning				Order
	2009	2010	2011	2012	
Cost savings realized	68	70	64	57	4
Increased investment in workforce or employee skills	50	66	67	65	1
Increased investment in plant/equipment	53	57	57	60	2
Retained otherwise lost jobs	50	53	60	55	5
Retained otherwise lost sales	40	51	38	40	9
Created new jobs	34	51	52	42	6
Avoided unnecessary investments	29	51	48	40	8
Increased sales	42	47	48	60	3
Increased investments in other areas	34	45	48	43	7
Increased investments in information systems or software	42	28	36	29	10

\$17,366,553 in new sales, or roughly 67 percent of the total. Using only the edited responses, the corresponding figure to new sales was \$7,316,553, or about 68 percent of the total.

Future Challenges

Turning to retained sales and considering all responses, the amount attributable to new customers, markets, products, and services was \$17,532,500, roughly 4 percent of the total. For the edited responses, the corresponding figure was \$1,532,800, or approximately 10 percent of the total.

The State of Montana provides approximately \$200,000 per year in funding to support MMEC. As shown in Table 8, MMEC projects during 2012 generated approximately \$2,063,683 in Montana Individual Income Taxes from both direct and indirect jobs. Montana's return on investment during 2012 was approximately 10.3 to 1 ($\$2,063,683 / \$200,000 = 10.3$). Therefore, the public dollars invested in MMEC provide Montanans an excellent rate of return.

Outcomes of MMEC Visits and Services

Economic Impact	2008	2009	As Reported	Edited*
New and retained jobs	142	113	355	221
New and retained sales	\$23,460,000	\$8,870,000	\$170,562,000	\$30,562,000
Cost savings	\$2,240,000	\$2,200,000	\$13,462,900	\$3,462,900
Capital and workforce investments	\$6,410,000	\$2,466,700	\$29,489,900	\$12,214,900
Investment in plant/equipment		\$1,849,000	\$7,940,200	\$7,690,200
Investment in information systems or software		\$297,140	\$226,600	\$226,600
Investment in workforce practices or employee skills		\$320,600	\$718,700	\$693,700
Other investments		\$1,028,00	\$20,604,400	\$3,604,440
Avoided unnecessary investments		\$296,100	\$3,862,300	\$1,862,300

Economic Impact	- 2011 -		- 2012 -	
	As Reported	Edited*	As Reported	Edited*
New and retained jobs	890	285	440	160
New and retained sales	\$231,940,000	\$31,939,800	\$200,262,916	\$25,262,916
Cost savings	\$21,809,100	\$1,326,300	\$7,669,722	\$1,921,722
Capital and workforce investments	\$20,347,000	\$18,694,000	\$31,847,139	\$12,102,787
Investment in plant/equipment	\$15,800,400	\$14,200,400	\$13,011,450	\$6,811,450
Investment in information systems or software	\$583,300	\$583,300	\$191,200	\$191,200
Investment in workforce practices or employee skills	\$459,600	\$406,600	\$789,311	\$676,579
Other investments	\$3,503,700	\$3,503,700	\$16,312,588	\$2,880,968
Avoided unnecessary investments	\$2,564,700	\$514,700	\$1,542,590	\$1,542,590

Economic Impact	Total Five Years (2008-2012)	Since MMEC Inception (1996)
New and retained jobs	1,500	2,999
New and retained sales	\$635,094,916	845,534,916
Cost savings	\$47,381,722	71,811,722
Capital and workforce investments	\$90,560,739	127,184,039
Investment in plant/equipment	-	-
Investment in information systems or software	-	-
Investment in workforce practices or employee skills	-	-
Other investments	-	-
Avoided unnecessary investments	-	-

Quantitative Estimates of MMEC Visit Outcomes

Sector	Jobs	Wages	Montana Individual Income Taxes
Manufacturing	440	\$18,640,000	\$785,600
Other Industries	1,135	\$32,942,080	\$1,277,683
Total	1,575	\$51,582,080	\$2,063,683

Table 9
New Customers, New Markets, New Products
and New Services

"Did the services you received from MMEC lead to..."	Percent Mentioning	Rank Order
New Customers?	40	2
New Markets?	36	3
New Products?	26	4
New Services?	5	5
Increased Investment in New Products or Processes?	57	1

Economic Impacts of MMEC Visits and Services

Market Outcomes of MMEC Visits

	As Reported	Edited
New Sales Attributable to New Customers, Markets, Products, and Services	\$17,366,553	\$7,316,553
Retained Sales Attributable to New Customers, Markets, Products, and Services	\$7,316,553	\$1,532,500
Increased Investment in New Products or Processes?	\$2,071,830	\$2,071,830

Return on Investment (ROI)

