

Building Project Manager Competencies Via the Mentor/Apprentice Relationship

Executive Summary

In 1999, the legislative body enacted law that required oversight of any information technology projects in excess of \$250,000.00. This was the result of a legislative perception that projects were not being managed well. For approximately 5 years, the oversight function was primarily audit-based. The Enterprise Project Management Office (EPMO) for the State of North Dakota was formally chartered in April 2004 to improve the success of IT projects. The present Enterprise Project Manager (EPM) was appointed effective June 1, 2004. In addition to the EPM, there is one additional staff member that is also assigned to the large project oversight function.

The EPMO was chartered with six main functions. They are:

1. Project Management Best Practices
2. Project Management Training, Mentoring, and Certification
3. Large Project Oversight
4. Project Management Consulting
5. Outreach and Coordination of PM Issues and Topics
6. Coordination of Projects Across the Enterprise

This nomination is based on the efforts of the EPMO and the EPM Advisory Group to increase the competencies of project managers across all entities of State government via training, mentoring, and certification efforts. A key innovation impacting success rates of this initiative was the validation of competencies through the apprentice/mentor relationship. The State of North Dakota had previously provided an eclectic array of classroom training opportunities, certification programs, and on-the-job learning opportunities. However, the EPM Advisory group agreed that while those components of learning were all critical, the ability to measure whether the activities had a direct impact on the employee's competency or effectiveness was not being captured. In May 2005, the State of North Dakota began a pilot project based on a training model being constructed by CompTIA on behalf of the Federal Department of Labor. This model intended to combine the existing apprenticeship model utilized for professions ranging from electricians to pharmacists with a wide range of professions within the information technology field, including project management.

This program has been marketed within the State of North Dakota to Executive Branch agencies, Legislative Branch, Judicial Branch, K-12 Schools, ND University System, and elected officials. Externally, the Enterprise Project Manager has presented this program to the NASCIO Project Management Forum via conference call and is scheduled to present the outcomes at the ProjectWorld & World Congress for Business Analysts and the Center for Business Practices Benchmarking Forum for Government Project Management Best Practices in November 2007.

Subjective and objective data was collected relating to both project performance and participant involvement. That data was analyzed by Dr. John Aaron, Milestone Planning, Inc. who indicated the program had a practical and statistically significant impact in reducing project cost variances as well as improving project manager effectiveness. Of key importance to the initiative's return on investment was Dr. Aaron's finding that, "classroom training plus mentoring (i.e. apprenticeship) is the most powerful predictor of % cost variance reduction".

Business Problem and Solution

In 1999, the legislative body enacted law that required oversight of any information technology project in excess of \$250,000.00. This was the result of a legislative perception that projects were not being managed well. For approximately 5 years, the oversight function was primarily audit-based. The audit process was effective in identifying projects that were exceeding acceptable variances, and the oversight analysts did provide consultation and coaching to assist with project recovery. Yet, variances to project budget, schedule, and scope/quality were frequent and in some cases, the variances were extreme. This was associated with several problem areas, including:

- No common project management methodology existed. Each entity developed disparate methodologies based on individual levels of training, experience, preference, and political influence.
- The State lacked a governance structure that would allow for the collection and dissemination of best practices, tools, and templates in a centralized fashion.
- Project Management was not considered to be a career path. Many, if not all, existing project managers were employees previously trained in a specific information technology skill set and acted in a dual capacity.

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The EPM Advisory Group, consisting of experienced project managers from a cross-section of state agencies and political entities began the process of creating a single methodology, a workable standard for the project management of large information technology projects, and a family of project manager job descriptions. With each of these tools complete, the foundation for success was established. However, the EPM Advisory Group recognized that the establishment of tools, guidelines, and job classifications did not account for, or substantially improve the competency of individual project managers.

This nomination is based on the efforts of the EPMO and the EPM Advisory Group to increase the competencies of project managers across all entities of state government via training, mentoring, and certification efforts. A key innovation impacting success rates of this initiative was the validation of competencies through the apprentice/mentor relationship. The State of North Dakota had previously provided an eclectic array of classroom training opportunities, certification programs, and on-the-job learning opportunities. However, the EPM Advisory group agreed that while those components of learning were all critical, the ability to measure whether the activities had a direct impact on the employee's competency or effectiveness was not being captured. In May 2005, the State of North Dakota began a pilot project based on a training model being constructed by CompTIA on behalf of the Federal Department of Labor. This model intended to combine the existing apprenticeship model utilized with professions ranging from electricians to pharmacists with a wide range of professions within the information technology field, including project management. As a complete training

program, the model contained elements of classroom training, on-the-job learning, certification, and competency validation via mentoring. The program is divided into three distinct levels of proficiency with associated levels of increased training and more complex competencies (see figure 1).

Figure 1

Level	Required Hours of Classroom Instruction	Required Hrs of On-The-Job Learning	Required Qualification and Skill Validations	Required Certifications
Level 1 – Entry	24 Hours	N/A	30 Competencies	N/A
Level 2 – Full Working PM	60 Hours	2000 Hours IT Project Mgmt	43 Competencies	IT Project+ or PMI CAPM
Level 3 – Journey	60 Hours	2000 Hours IT Project Mgmt	47 Competencies	PMP
<i>Total</i>	<i>144 Hours</i>	<i>4000 Hours IT Project Mgmt</i>	<i>160 over the course of 3 projects</i>	<i>PMP</i>

While CompTIA’s beta model provided a framework for the ND program, an extensive project was undertaken to develop the processes that would support and govern the initiative, establish the artifacts that would be utilized to train the apprentice candidates, map the newly created ND Project Management Guidebook to the extensive set of documented competencies, and train the initial mentor group. In addition, the project included approximately 18 months of controlled program activity to establish and collect metrics necessary to determine success. Data collection was completed as of March 31, 2007 which corresponded with the conclusion of the 1st quarter of the large project oversight reporting process for 2007. In total, project activities spanned a period of 22 months.

Significance Of The Project To The Improvement Of The Operation Of Government

This initiative has had a tremendous impact on the operation of government as it relates to the increasing need to manage a significant number of high profile, complex technology projects within budget, schedule, scope, and quality constraints. For a small state such as North Dakota, the ability to develop competent project managers offers great advantages in light of the competition of national recruiting efforts.

In total, 140 project management practitioners, project team members, and executives participated in one or more components of the training program. Initially, a 3-day project management training course was offered to all 140 participants. Entities represented by this group included the Department of Human Services, Department of Transportation, Department of Health, Information Technology Department, Bank of North Dakota, ND Public Employees Retirement System, Job Service ND, Workforce Safety and Insurance, Judicial Branch, Attorney General, Department of Emergency Management, Bismarck Public Schools, North Dakota University System, and EduTech. To bring all of these entities together in a unified effort to improve project management practices across state government in the absence of a legislative mandate was no small feat and is truly representative of the EPM Advisory Group’s ability to influence without authority.

Of those who participated in the training effort, a sub-set continued on to pursue certification. At the onset, ND State Government employed only one credentialed Project Management Professional (PMP). At this time, 11 practicing project managers possess the PMP credential. An additional 28 staff passed the exam and received the CompTIA Project+ certification.

A final sub-set of participants continued on to participate in the mentoring relationship where they worked on live projects and demonstrated their PM competency over the lifecycle of the project. As

noted in Figure 1, the advanced levels require a considerable amount of demonstrated on-the-job learning combined with the validation of specific competencies throughout the project. At the completion of this project, 13 apprentices earned the Level 1 certification, 8 earned Level 2 certification, and 5 earned Level 3 certification. An additional 19 apprentices continue to be actively pursuing certification at varying levels.

A survey was conducted of all participants regardless of their level of involvement. Several improvements were identified, including:

Question: Has your involvement in this initiative provided you with or broadened your resource pool to discuss questions, issues, and ideas related to project management?

Response: 82.5% of respondents indicated an increase in their resource pool to discuss PM topics, issues, etc.

Question: Has the ND Project Management Guidebook contributed positively to your skills/abilities to successfully manage projects?

Response 78.5% felt that the PM Guidebook helped them to be more successful.

In addition, the large project oversight process has been successfully streamlined in a manner wherein all large projects provide the business case, charter, project plan, required reporting documents, and post implementation review in a consistent manner aligned with the ND Project Management Guidebook. Oversight analysts have indicated that the inclusion of the mentor/apprenticeship relationship, specifically to those projects of the scale to require oversight, was a significant causal factor. Indirectly, this led to a decrease in the amount of time required for the audit function and an increased amount of time available to provide consulting services.

Finally, there has been an increase in the trust and confidence level of the legislative IT committee which has subsequently decreased the need for formal lawmaking to control PM practices.

Public Value of the Project

To further substantiate the projects value to the recipients, agencies, and the state, the survey requested each respondent answer questions related to their perceived effectiveness as a project manager and the overall value of the program. In consideration of space, only the responses of those participants who were involved in the mentor/apprentice relationship will be displayed.

Question: Please indicate your level of effectiveness as a project manager or project participant PRIOR TO participating in the training/mentorship program.

Response: When isolating those respondents who participated in the mentor/apprentice relationship, 23% of respondents categorized their project management effectiveness PRIOR to involvement in the apprenticeship program as either Extremely Effective or Quite Effective. 77% of respondents categorized their project management effectiveness in a range from Somewhat Effective to Extremely Ineffective.

Question: How would you describe your CURRENT effectiveness as a project manager or project participant?

Response: When isolating those respondents who participated in the mentor/apprentice relationship, 77% of respondents categorized their project management effectiveness AFTER involvement in the apprenticeship program as either Extremely Effective or Quite Effective. 15% of respondents categorized their project management effectiveness in a range from Somewhat Effective to Extremely Ineffective.

Question: My involvement in the program has contributed to my CURRENT EFFECTIVENESS as a project manager or project participant.
 Response: When isolating those respondents who participated in the mentor/apprentice relationship, 69% of respondents attributed the increase in their project management effectiveness to involvement in the program.

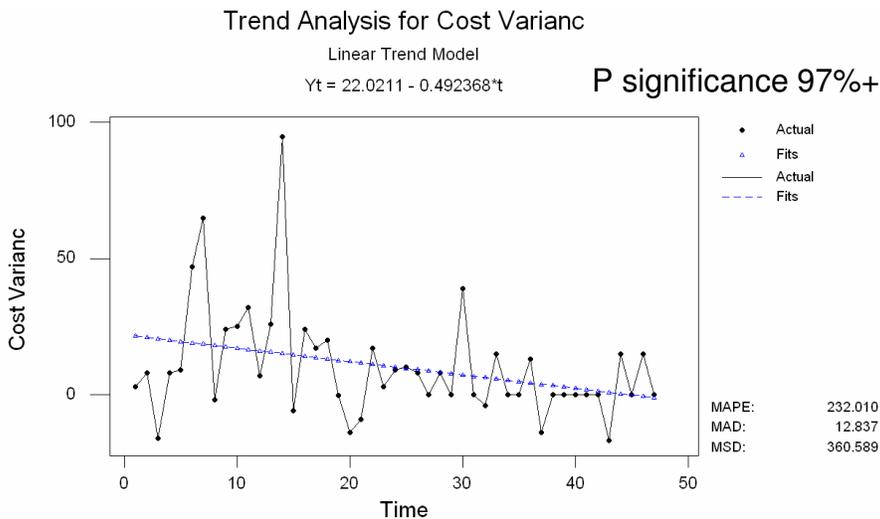
Question: For me personally, participation in the program has been worth the investment in time and money.
 Response: When isolating those respondents who were directly involved in the mentor/apprentice relationship, 75% agreed or strongly agreed.

Dr. Aaron noted this data was supported by a t test that indicated at a 95% confidence level that the current effectiveness of the sample group had improved.

While self-reported data is important, and in this case strongly indicates the success of the program, it was also important to measure whether that increase in perceived effectiveness had a direct impact on the cost and schedule variance of participating projects. For this study, documentation was gathered in reference to projects dating to a period prior to the inception of the program. In this manner, analysis could be conducted regarding projects that began and concluded prior to the program, projects that began prior to the program and concluded during the lifecycle of the program, and projects that both started and concluded during the program. In addition, each project was identified by the primary project manager. Each project manager received a point value that increased based on the level of participation in the various attributes of the program. Finally, baseline project budget data and budget at completion data, as well as corresponding schedule data indicating positive or negative variances were provided to Dr. John Aaron, Milestone Planning, Inc. for statistical analysis.

Figure 2 shows a trend analysis of cost variance in percentage values by project. The sequence was sorted by priority of 1) program participant maturity, 2) actual finish, and 3) project start. The results showed, at a confidence level of 97%, a significant downward trend in the degree of cost variance as the program matured.

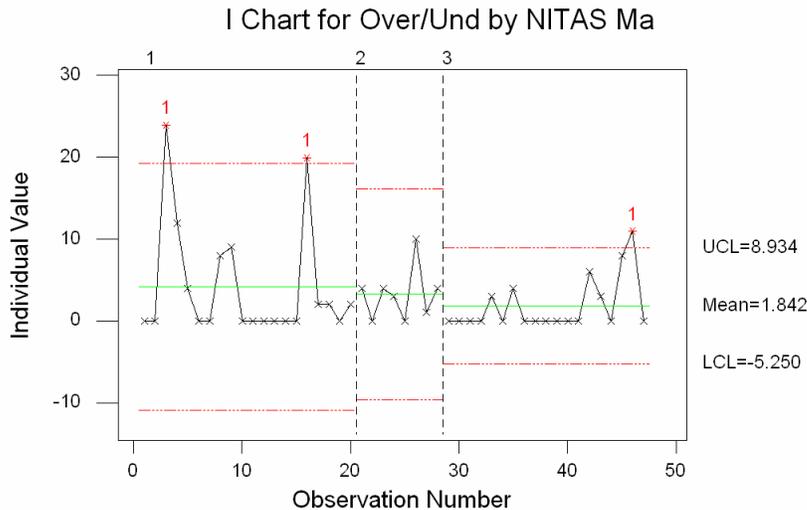
Figure 2



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Finally, Figure 3 depicts an analysis of schedule variance in months by project. The sequence was sorted by priority of 1) program participant maturity, 2) actual finish, and 3) project start. In this instance, group 3 clearly indicates those projects that both started and completed during the program had significantly less negative variance.

Figure 3



Project cost and return on investment, as well as projected cost avoidance indicate project success. The hard cost of this project was \$125,000 for the classroom training effort. All other costs are related to staff time while involved in the program as a project team member, training participant, apprentice, or mentor. Those costs were estimated using a blended rate, rather than actual salary plus benefits to ensure all costs had been captured. Staff costs are estimated at \$275,000 for a total project cost of \$400,000. As shown in Figure 2, those projects managed by mentors, or apprentices under the guidance of mentors showed a statistically significant decrease in cost variance. Using a weighted average of project budgets, apprentices managed in excess of \$6,000,000 in large information technology projects that both began and completed during the lifecycle of the program. Cost variances were averaged based on the weighted budgets and totaled \$1,750.00. If one considers that the negative cost variance of pre-apprenticeship projects shown in Figure 2 was between 15% and 20%, an argument could be made that the positive outcomes of the projects undertaken by apprentices have concurrently paid the initial cost of the project via cost avoidance. However, to be conservative, ROI calculations have been estimated against future projects.

In excess of \$200 million dollars have been appropriated for large information technology projects during the 2007-2009 biennium. If project managers who were previously involved in this program are assigned to manage 50% of those projects and impact cost variance by as little as 2%, the savings to the state of North Dakota will be 2 million dollars or a return on investment of 400% (ROI = [(Payback-Investment)/Investment]*100) over a two year period. Additionally, one must consider the cost avoidance that will be incurred by decreasing negative schedule variances and increasing the amount of time that state employees are available to provide direct service to our constituents.

It is with great pride that the State of North Dakota submits this initiative under the category of IT Project and Portfolio Management, specifically in the spirit of “improving the project management discipline through training, mentoring, and career-path efforts” and “strengthening the management of individual projects to ensure that funds are being expended properly and that projects are within scope, schedule and quality”.