



Title: 'PMO: LIVE' @ CH2M

A BUSINESS CASE

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Abstract

CH2M, the global full-service consulting, design, construction and operations engineering company, has an exhaustive collection of documents in its virtual Project Management Office (PMO) collection. The problem? It's cumbersome and hard to penetrate; difficult to find a clear path and obscures the real issues faced in project management.

Asma Razavi, Sallam Thabet, Alexis Wittman propose a project management office (PMO:LIVE) which can initiate training, mentoring, facilitation, and company credentialing to build the skill of its project managers and increase project performance metrics. Aiming initially for one group, that of, Operation Management Services (OMS), which manages multiple projects through programs with long-held, sustaining clients, it is hoped that such an approach can be applied across the company eventually. This is the business case for the project of setting up a live project management office.

Note: This is not for circulation beyond the class. It is intended only a class project.



Executive Summary

CH2M has a long record of successful project management, much of it documented in its web-based virtual office. However, seeking to improve project performance and develop the depth of the project management team's skill in using standard project management tools, we propose a *physical project management office," PMO: LIVE"*, to oversee the process. Beyond the benefit to the bottom line, and an efficiency of project work, it is our expectation that these improvements will translate to building better client relationship and confidence for project work in the future.

Objective

Improve product delivery, consistency, and profitability, ensuring client satisfaction and recognition for project management services while building competencies on the project management team 'bench'.

Scope

This project provides necessary tools, personnel, budgets, and organization to create a PMO for the OMS group. It suggests areas for improvement for the existing tools available in the virtual PMO. It also identifies training modules and work-sessions to bring the PMs within OMS into one relatively consistent system of project delivery. Also, the metrics necessary to judge performance gains and evaluate the program are suggested. Excluded from the scope at this time is a full-scale revision of the virtual project office found on the CH2M inter-web, nor project control dashboards. This project will work with existing resources until such time that a redesign of those resources is possible.

Return on Investment

At Yr. 3 with expected project related savings of from \$5.2M to \$11.2M, the ROI is between \$1.2/\$5.2M or 78% and 90%. If continued beyond the trial period, than cumulative savings at Yr. 5, bring a ROI of \$2.4M/\$16.8M and \$2.4M/\$34.8M or 86% and 93%.

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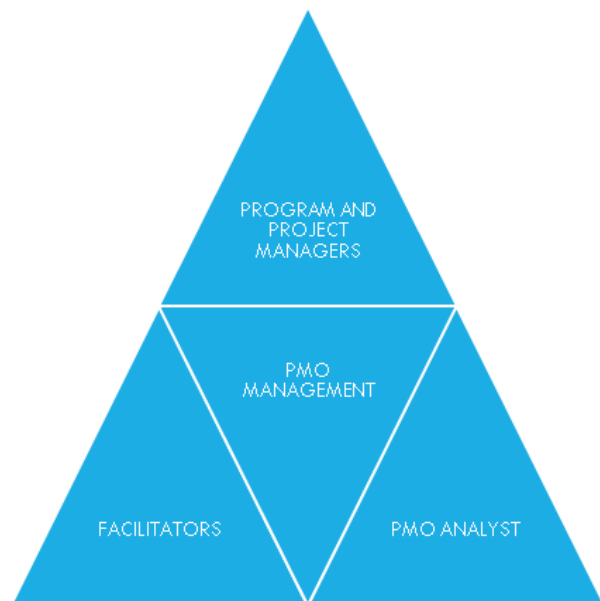
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PMO: Live structure and description

This to be called PMO: LIVE (“*Live Interaction is Very Essential*”). The value of live interaction, both at the level of project teams through facilitated work sessions, and live interaction between project managers and members of the PMO: LIVE team will prove to be the difference between consistently great project management and the utilization of valuable tools--and the difference between merely throwing content onto a web-page hoping it will be adopted for use by project managers and teams.

While CH2M has provided support on-line, there is real difficulty in using it, in training from it, and developing project management standards. In the model of leading from a support position, from a helping hand so to speak --the need appears to be one of enhancing the culture of support for PMs, active enhanced training, and follow through. In particular, we are suggesting the PMO:LIVE consist of the PMO Director, a PMO Analyst for technical support, and a group of what we are calling 'Case Managers', experienced project managers with a gift for training and facilitating.



The responsibility is to support *the process* while project managers manage *the projects*.

We are suggesting the rollout of a test case within one business unit first, Operations Management Services. OMS manages multiple projects large and small within their programs for technological clients. This group is known for its long term, successful projects and has managers at all scales contributing to their body of work. OMS was selected as the ideal group to work with because they are a small enough group to develop the program through yet handles a large volume of projects through the course of a year. Their management team is also located primarily on the West Coast. As the process is modeled, tested, evaluated, and considered valuable to CH2M, other business units can be added to the program. The project will be physically located in the San Jose CH2M office.

Gap Analysis

Currently CH2M has a virtual Project Management Office, or PMO, which serves multiple business units providing engineering services worldwide. While the tools found in the virtual PMO (VPMO) are available to all, including those not in project management roles, they are not fully utilized. There are over 80 documents stored here, most very lengthy and difficult to access, take-in, and use. In fact, a survey done in 2009, found that only 40% of operating project managers took advantage, or perhaps better said, saw value in the materials found there. Sample comments from the survey:

"The portal is not well organized. I can't find stuff that I know is in there."

"We need a project delivery work flow that all project managers are required to follow"

We need more "Big P" (Big Project) to be more competitive -- like Fluor."

Bring quality to the forefront of everything we do.

It is time for a new survey but it's clear that the same issues continue. In addition, there is a general recognition that project could be run more consistently and that project managers need more training. As a recognized corporate strategy, the OMS Group has identified areas for improvement that are matched in our Strategic Alignment that follows.

Strategic Alignment

The OMS Group has recognized the importance of developing strong relationships with its clients while integrating talent and capabilities from across the firm: To offer long-term value at a competitive price and obtain business renewals and new contracts.

| | OMS GROUP STRATEGY | PMO ALIGNMENT |
|---------------------------------|--|---|
| Customer Care | Become even more client-centric | PMO:LIVE serves client by providing services and accountability! |
| Enterprise Collaboration | Management systems deployed consistently at all projects in a geographically diverser network of local offices backed by global expertise | PMO:LIVE yields consistent project systems across global teams! |
| Bench Strength | Look for opportunities for continuous improvement and innovation | PMO:LIVE enhances program and project managers success and builds talent! |
| Training | Participate in training and development opportunities | PMO:LIVE training leads to CH2M credentials and recognition! |
| Employee Engagement | Corporate culture, values and reward systems that reinforces collaborative, ethical and inclusive behavior and corporate citizenship. ¹ | PMO:LIVE builds team relationships, foster quality and rewards achievements! |

Scope

In order to create a new model PMO: LIVE with the goal to improve product delivery, consistency, and profitability, ensure client satisfaction and recognition for project management services while building competencies on the project management team 'bench', there are necessary steps to get there. This project seeks to eliminate the confusion regarding tools available on its virtual PMO and improve the usage of project management tools across the board. There are strong training,

¹ CH2M Operations Management Services 2015 Strategy Summary

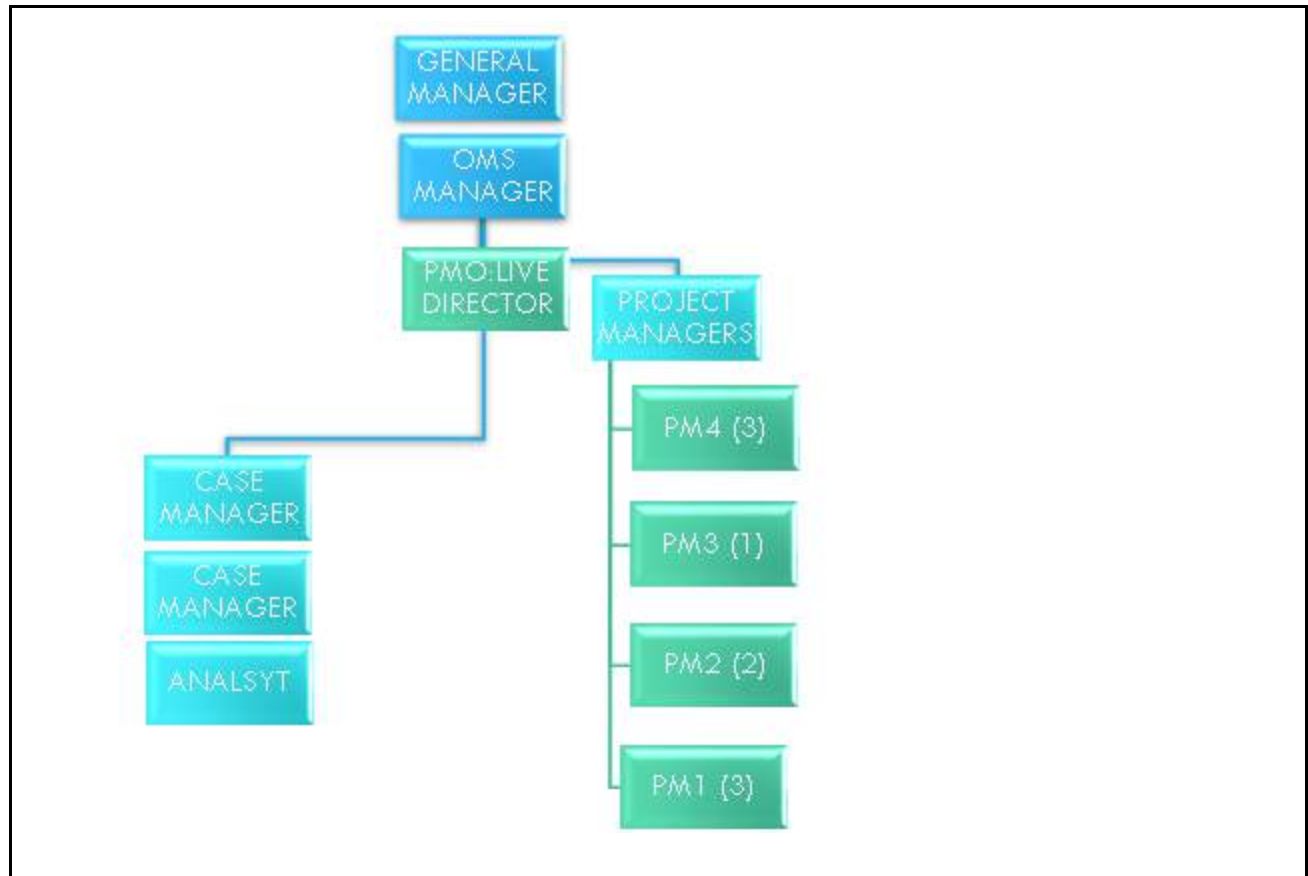
facilitation, and PM accreditation components. This project serves furthermore as a test case with the expectation that the methods achieved by it can be used in other groups within CH2M.

The project deliverables include:

- PROJECT CHARTER
- GAP ANALYSIS: EXISTING METHODS
- VALUE PROPOSITION
- RISK RESPONSE PLAN
- PM TOOLBOX
- METRICS FOR VALUE ADDED MEASUREMENT
- NEW STANDARDS FOR DOCUMENTATION?
- POLICIES FOR USAGE (ie: PROJECT FACILITATION?)
- TRAINING AND CREDENTIALLING PROGRAM
- PMO: LIVE ROLL-OUT
- PMO: LIVE EVALUATION

OMS Staffing Chart

The PMO: LIVE Director reports to the OMS Manager. Both the project management team and the PMO: LIVE team fall under the PMO: LIVE Director.



| VALUE PROPOSITION | | |
|-----------------------------------|---|--|
| Charter | Services | Benefits |
| PMO is well managed | Expert project management + competence | Strategic Alignment |
| Meet deliverable and expectations | Project management support and guidance | Informed decision making |
| Develop PM Teams | Training | Resources: Deep bench |
| Create Value (ROI) | Consistent project delivery | Quality assurance: Ensure project deliverable meet customer expectations |

Financials

The return on investment for the proposed PMO: LIVE is significant:

- More accurate scope definitions through more stringent contracting procedures, better programming of client determinants, reduced changes to scope and an ability to manage contract exclusions.
- Increased accuracy in the use of a WBS (Work Breakdown Structure) yielding better work-plans, more accurate schedules, thus better budgets and profit to the company.
- Better workflow, more professional project managers, and a clear path to personal professional development.
- Improved resource management through project management in-house training and accreditation making assignment of projects better tuned to the talent level.
- Professionally trained resources to intercede in project processes at key points, and as on going process consultants.
- Reduced errors or mistakes on projects through oversight and counsel, better use of lessons learned knowledge database material, and constant process improvement.

All these benefits are ultimately to the betterment of our clients, our employees, and our work. Having the PMO: LIVE also gives the client a place to connect as projects develop issues and new ways of resolving issues that can arise even when best project standard practices are followed. Measurable outcomes can show that increased revenue, market share, cost savings, promotion and new client development can be expected to follow such a plan.

Projected Budget

This Project Budget carries the PMO into Year 3. On-going expenses to maintain the PMO for the OMS group is also indicated as carried by Year 4 and Year 5.

| | Year 1 (1/2-year) | Year 2 | Year 3 (1/2-year) | Project Complete/ Total | ½ yr On- going | Year 4 On-going | Yr- 5 On- going | 5-yr Total |
|-----------------------------------|--------------------------|-----------------------|----------------------|------------------------------------|-------------------|--------------------|---------------------|-------------------|
| Office Space | 4*2K= \$8K | 4*4K= \$16K | 4*2K= \$8K | \$40K | 8K | 4*4K= \$16K | 4*4K= \$16K | \$68K |
| Staff 1-Director 2-Case Mgr | 4* \$65K(avg)= \$260K | 4* 130K= \$520K | 4* \$65K= \$260K | \$1040K | 260K | 4* 130K= \$520K | 4* 130K)= \$520K | \$2080K |

| | | | | | | | | |
|-------------------|------------------|------------------|------------------|------------------|-------------------|--------------------|--------------------|-----------------|
| 1-Analyst | | | | | | | | |
| Consulting | \$15K | \$8K | - | \$23K | - | \$8K | - | \$31K |
| Training Courses* | 3*\$8K= \$24K | 3*\$8K= \$24K | 3*\$8K= \$24K | \$72K | .75*\$8K= \$6K | 1.5*\$8K= \$12K | 1.5*\$8K= \$12K | \$102K |
| Equipment | \$10K | \$3K | \$1.5K | \$14.5K | \$1.5K | \$3K | \$3K | \$22K |
| Supplies | \$1.5K | \$3K | \$1.5K | \$6K | \$1.5K | \$3K | \$3K | \$15K |
| PMI Training | - | - | 2*\$1K= \$2K | \$2K | - | 2*\$1K= \$2K | 2*\$1K= \$2K | \$6K |
| PMI Testing | - | - | 2*\$.4K | \$.8K | - | 2*\$.4K | 2*\$.4K | \$18K |
| PMI PDUs | - | - | 2*\$3K= \$6K | \$6K | - | 2*\$3K= \$6K | 2*\$3K= \$6K | \$18K |
| | \$318.5K | \$574K | \$303.8K | \$1204.3K | \$277K | \$570.8K | \$559.8 | \$2,360K |

*After year 3, or to project completion, which ever comes first, an equivalent of 9 project managers would have received complete training on tool usage. After Year 5, a total of 12+ equivalent project managers would be fully trained. It is assumed that different rate of accreditation would be achieved and the goal to have senior PMs fully trained in all tools would be achieved, with junior PMs receiving training to a lesser degree. Also, senior PMs are supported in their efforts to obtain PMI accreditation (as is the current policy) and these costs are also included.^{2,3}

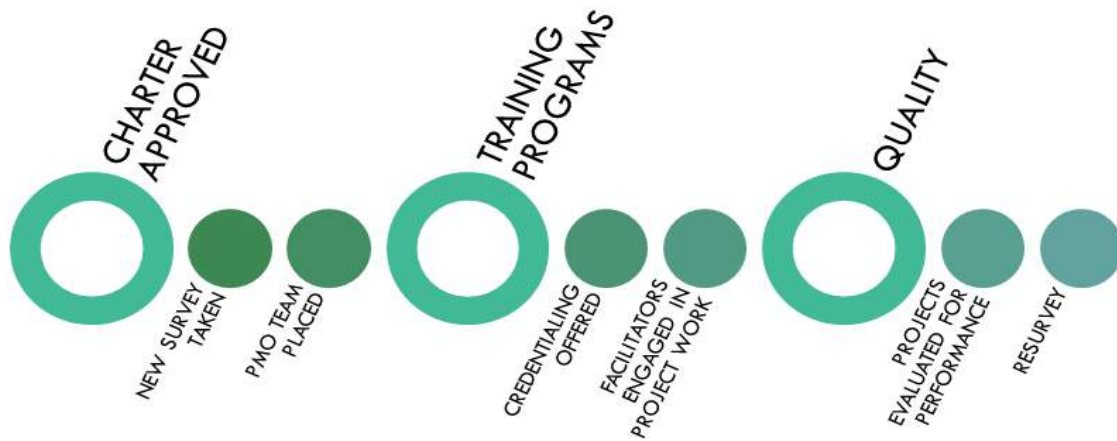
Return on Investment (ROI)

| | | | |
|------------------------|--------------------|---------------------|--|
| If project budgets are | Project work value | than savings =\$4M- | |
|------------------------|--------------------|---------------------|--|

² <https://pamstanton.wordpress.com/2011/01/21/pmi-certification-is-it-worth-it/>

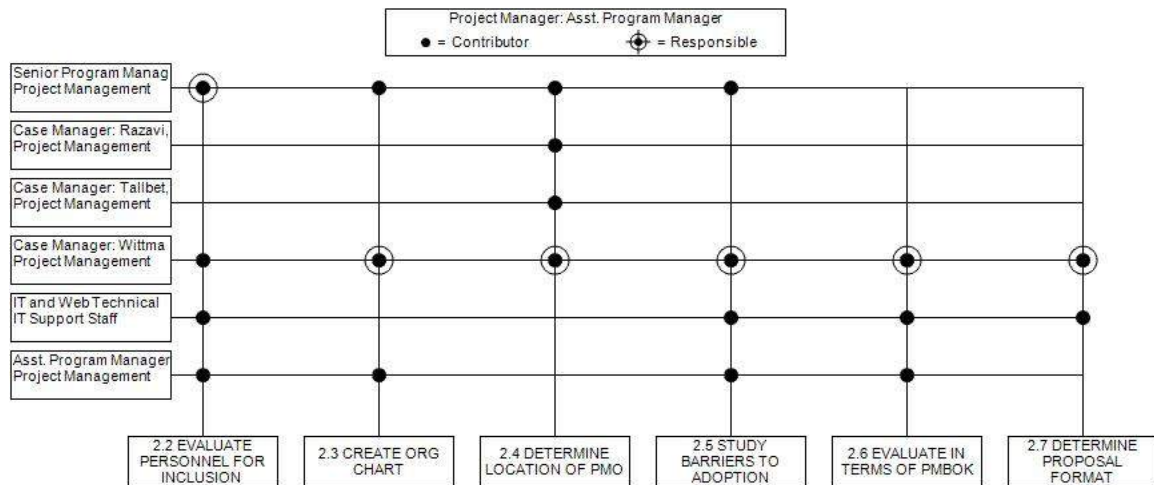
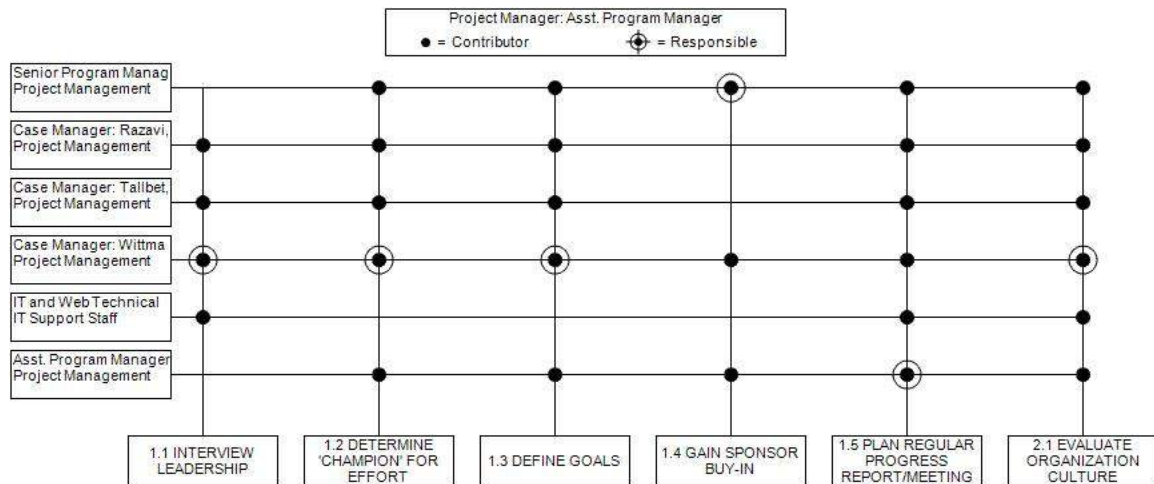
³ <http://www.ricardo-vargas.com/articles/determining-the-mathematical-roi-of-a-project-management-office-pmo-implementation/>

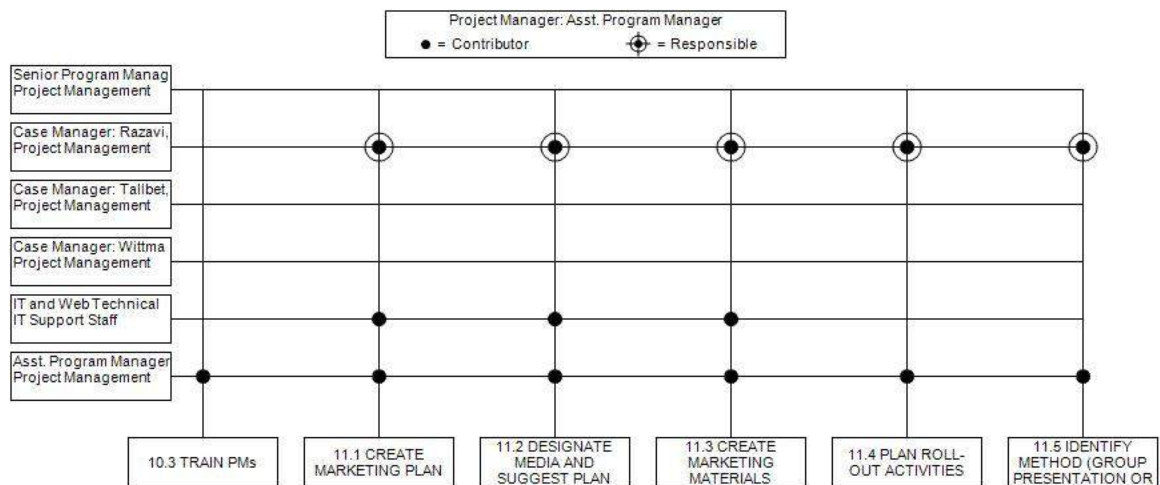
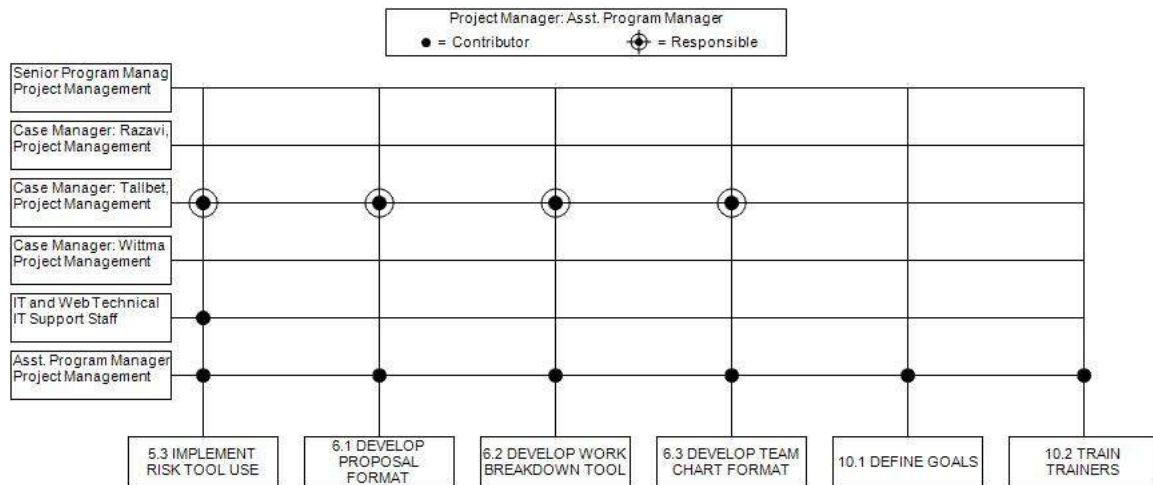
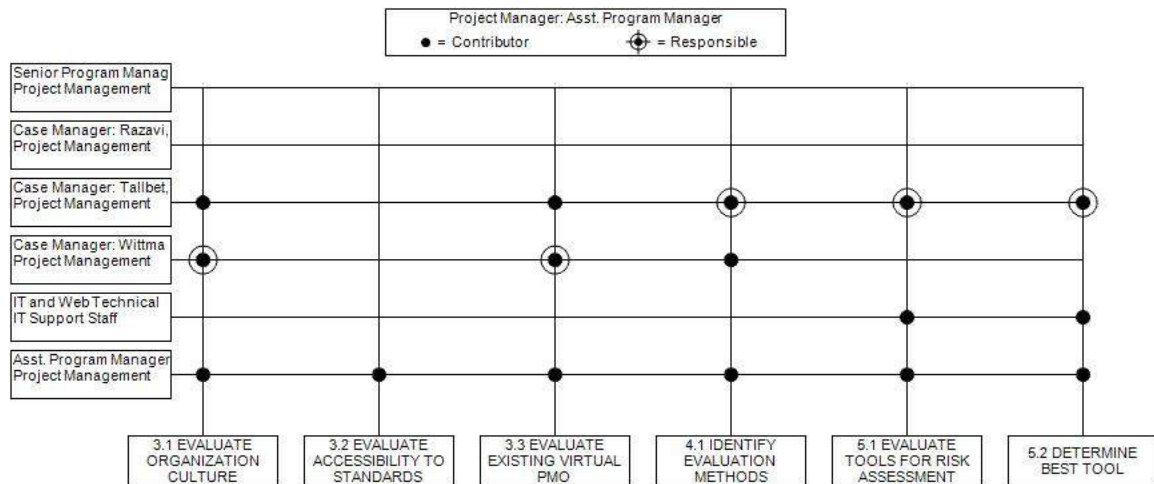
There are three major phases of project: Charter Approval kicks off a new survey and analysis, hiring of the PMO team members. Than training programs and processes including facilitation are initiated with the team of project managers as projects come on-line. Finally the PMO: LIVE is evaluated through metrics related to schedule and budget, resurveying participants, and fine-tuning. A decision to continue the PMO occurs at this point and an on-going operational budget determined.



Responsibility Matrix

Responsibility matrix is a tool for assigning responsibilities. The vertical axis lists the personnel who are responsible and contributor to the creation of PMO and on the horizontal axis the activities taken from WBS are listed out. The following images show how responsibilities are assigned to all of the personnel.





PMO: LIVE Assessment of Projects

The PMO can validate whether the work is effective through a combination of project auditing and organization assessments.⁴

Project –level audits

Many of the services provided by the PMO, such as coaching and training, are designed to build capability and increase skill levels. The auditing service, however, serves two functions.

- A case manager can audit to check compliance. It is used to ensure that project managers are using the new project management processes. The results of the project audits will be used as input into the periodic organization assessments.
- Auditing can also be an opportunity for coaching. During the audit, case managers can help the project manager understand how the methodology is applicable to their project. If project managers are open minded, a project audit could be an opportunity to learn new things about how the project management processes apply to them.

Project audits are one way for the PMO to validate that the project teams are utilizing the appropriate project management processes. It is one thing to provide training and coaching and have all the appropriate processes and templates defined. It is another thing for the new processes to actually be adopted and utilized by the project teams. If PMO wants to change the culture and make sure that the new processes are sticking, case managers must make sure that the project teams are utilizing them correctly. The purpose of the auditing session is to determine how well the project manager and project team are utilizing the project management methodology. During the project audit, a member of the PMO asks a series of questions to ensure compliance with the required processes and procedures.

To help reinforce the responsibilities of the managers, the results of the project audit should be documented and sent back to the project manager, as well as the case managers. In addition, the results are summarized and sent to the senior executives and other stakeholders.

Organization Assessments

Audits are done on a project-by-project basis. However, on a periodic basis (yearly or semi-annually) the PMO should look at the entire organization and assess how well the project management processes are being integrated into the work routine. The assessments can consist of feedback from project audits, interviews with key managers and stakeholders, any feedback and any metrics that are available. These assessments are compared to the prior assessments to gain a sense for the progress being made. This information is especially interesting to the senior

⁴ http://www.aspe-sdlc.com/offers/pickups_0386572/pmo_whitepaper_by_tenstep.pdf

executives and other stakeholders who need to understand how the implementation is going and whether it is successful or not.

By performing a number of assessments over time, the PMO can gain a sense of whether project management processes are being successfully integrated into the organization. Assessments also offer the opportunity to take corrective actions if the new processes are not being successfully integrated into the organization.

Risks in Implementing a PMO: LIVE

There are many risks that can impede or delay the setting up of a project management office.⁵

Lack of top executives support can kill or delay the project

For implementing a PMO, one should start early. One must seek stakeholder and management consent and approval from the beginning of the project instead of waiting until formal approval/sign-off. Senior managers provide support as long as they see the clear plan for smooth transition. The idea of PMO should be presented with clear facts. In addition to highlighting the benefits of the PMO, stakeholders should be shown an action plan of how the benefits will be realized. A detailed timeline of activities with clearly established milestones must be provided. Convincing management and stakeholders could be a challenging job but it is achievable if you approach it with knowledge, confidence and perseverance.

Lack of organizational willingness to change

Organizational culture is made up of the attitudes, values, beliefs and behaviors of its employees. It reflects the demonstrated values and principles of the workplace, permeating everything an organization does. Essentially, it can make or break your organization.

The ideal organizational culture is one in which projects are considered in strategic planning and are implemented to support an organization's corporate strategy and corporate objectives. In this way, they receive the necessary attention and support of senior management and the organization's resources to allow them to succeed.

Creating an organizational 'project' culture requires organizations to:

- Understand what makes up their "ideal" organizational culture to incorporate projects.
- Measure where they stand today against the "ideal" organizational 'project' culture.
- Determine the goal and strategy to close the gap.
- Develop and implement the plan.
- Measure progress.⁶

⁵ <http://www.projectrisk.com/pmo.html>

⁶ <http://www.bia.ca/articles/HowToEstablishanOrgCultureThatSupportsProjs.htm>

Lack of commitment of time or energy from the current staff

Staff buy-in should begin at the beginning; that is, staff input should be solicited while the PMO plan is still in development, not once the planning process is over and implementation is ready to begin. The case manager should start by calling the team together and delivering a presentation about the project and its significance in a way that gets everybody fired up.

Inadequate funding for the engagement

The first step in getting funds for PMO is to convince stakeholders and management. Setting up a PMO could require funds for office space, training people, buying software packages and training sessions etc. Executive sponsorship will ease the change management challenges that come with instituting new project management processes inside and outside of the organization.

Inadequate training resources can hinder the PMO

Organizations around the world are implementing formal project management processes and disciplines to deliver their work initiatives on time, within budget and to an agreed upon level of quality. Part of the ability to execute better, faster and cheaper comes from the ability to implement common processes and practices across your entire organization. Without proper training there would be no learning curve for the project manager and the team as they transition from one project to another.

Trainings are necessary not only for staff development but also to deliver more value. They are necessary to address skill gaps and improve the competency of the project personnel. Hence, it is necessary to provide adequate trainings to staff for the better project management as well as the maturity of PMO.

PMO Organization Training

One of the deliverable in PMO implementation is training program. This task includes hiring relevant and experienced people for implementing PMO and providing training to them. Training is essential, as it will enhance communication, organizational skills and leadership skills. Providing the training program is a two-fold process. The first step involves identifying the project managers and case managers and the second step is to provide training depending upon the skill set. The PMO has collaborated with the PMO Analyst who will help evaluate and monitor use of the required training packages. The complete plan to provide coaching is determined in the steps below:

1. PMO will offer training to project managers, team members, and case managers within the organization. The first priority is to provide coaching to case managers who will co-ordinate with the project managers.
2. The PMO will assess the skill levels of the organization in comparison to the offered standards and mythology and will design and create training packages and coaching services required.
3. The PMO will develop a training plan for managers within the organization based on their skills set. The Training Plan includes training session for all the tools and methodologies used right from the initiation phase to the closeout phase.

PMO Toolbox

CH2M has a virtual PMO that acts as a 'Center of Excellence' for the organization. It integrates business group with the Data analytics group, program controls and data analytics. The services and solutions provided by this PMO include:

- Client related inquiry responses and planning
- Pursuit assistance
- Mobilization and start-up support
- Chartering and facilitation
- Staffing support
- Program reviews
- Employee program management training
- Program management career development

Even though this PMO has a clear vision and goal, a survey conducted recently indicates that only few of the project managers are aware of the PMO. They indicated few problems associated with it.

- Employees feel that systems, processes and tools are unfriendly and hard to use.
- Several employees asked for more training.
- Few felt that the PMO processes were enforced increasingly upon them.
- The processes are not consistent throughout the organization.
- PMO has a very limited staff.
- PMO doesn't document the value added.
- PMO lacks senior leadership support.
- PMO gives less value to quality.

Based on the above problems, we decided to implement the PMO as a physical office and tried to align it with the organization's objectives. However, to prove the value of this PMO we decided to implement it with OMS group.

The picture below shows the program activities involved. The Pursuit Process is covered in the first two phases and Program execution is covered in the last three phases.



The PMO toolbox package covers all the delivery phases of the program activities.

| PMO Toolbox | |
|-------------------------------|-------------------------------|
| Phases | Tools |
| Initiation | |
| | Program Initiation Matrix |
| | Project charter |
| | Stakeholder register |
| | In-frame/ out frame |
| | Project requirements document |
| | Communication strategy matrix |
| | Collaboration strategy matrix |
| Project Planning Phase | |
| Scope planning | WBS |
| | Traceability Matrix |
| Schedule Planning | |
| | Gantt chart |
| | Milestone chart |
| | CPM |

| | |
|----------------------------------|----------------------------|
| Resource /budget Planning | |
| | Responsibility Matrix |
| | Bottom-up Estimate |
| Risk Management | |
| | Risk Response plan |
| Communication Management | |
| | Management meetings |
| | Team Meetings |
| | Program management reports |
| | Records Review |
| Project Implementation | |
| Scope control | |
| | Project change request |
| | Project change log |
| Schedule control | |
| | Milestone Prediction chart |
| Cost control | |
| | Earned Value Analysis |

| | |
|------------------------------|---------------------------------|
| Quality control | |
| | Quality Improvement map |
| Performance Reporting | |
| | Summary progress report |
| | Lessons learned |
| | Postmortem review |
| | Stakeholders acceptance meeting |

Roll Out Plan

There are multiple steps that would be undertaken before establishing a Project Management Office. Such steps are to determine the different level of project managers as well as the different tools associates with such levels. These levels determine two main things, first it identifies the experience of the project manager and secondly it shows the amount of project management tools that the project manager is knowledgeable of. The different levels will be determined by 3 factors, these factors consist of hours experience in previous projects, the rate of previous project management success and lastly the difficulty of such projects. A further break down of the different levels, the first level will have a requirement of basic tools that every project manager should know to successfully manage different projects, this will be identified as a baseline for all project managers. The second factor focuses on the amount of experience hours a project manager has completed successfully. The last factor focuses on the success to failure ratio of projects managed in correlation with the difficulty of the project that where managed within such a level.

Such leveling of project managers allows for a more systematic approach of projects. That is done by separating the more experienced and knowledgeable project manager who want to improve their career and move up through the different levels from those who would like to maintain the level of project management at which they currently reside. Looking at the level we would be able to determine that lower level project managers would focus on easier project. Different incentives would be given toward project managers that different based on level. So higher level project managers would receive better packages than those on lower level projects.

The different level of project management, the tools associated with that level and the incentives could be better observed from the table below:

| Project Management Level | Experience Hours | Certificate | Incentive Package Level |
|--------------------------|------------------|--|---|
| 1- Baseline | 0 -1000 | Completed Internal Training Modules | A- Completed All Mandatory SOP requirements B- Requirement A + Completed Internal Training Modules |
| 2- Amateur | 1000 - 3000 | Certified Associate in Project Management (CAPM) Certificate | A- Completed All Mandatory SOP requirements B- Requirement A + Achieved CAPM Certificate |
| 3- Professional | 4000 - open | Project Management Professional (PMP) Certificate | A- Completed All Mandatory SOP requirements B- Requirement A + Achieved PMP Certificate |

The Baseline Project Manager would be required to be knowledgeable of three tools that are of different categories. The first an activity based tool known as a Work Breakdown Structure (WBS). The second tool is a responsibility assignment tool, which is known as the Responsibility Matrix. The third tool is a scheduling tool that is a Gantt chart or CPM.

Given the information provided the roll out of the PMO is complex that it will be divided into four phases as follows:

Phase 1: Project Management Office Initiation

The PMO initiation phase is considered to be the baseline phase. As CH2M Hill already has a PMO that is considered virtual, this phase will evaluate the existing PMO and remodel it to be reintroduced as a physical entity. It will require the assistance of higher management in developing

the key roles and responsibilities that the PMO will hold. This phase will also draw the order under which the PMO falls under within the organizations hierarchy.

Phase 2: Project Management Standard Operation Procedures

The Purpose of this phase is to establish a successful Project Management Office. To achieve such a goal it was important to understand the key responsibilities of how such an office will function internally within the organization. CH2MHill has proven to be one of the top leading firms in engineering consultancy so it will naturally have experienced project managers, which never the less requires the introduction of a more hands on PMO compared to the current hands off system that is in place.

In the process of identifying the scope of the PMO: LIVE it was determined that the SOP's will cover the procedure on how Projects are managed under a renewed and a redeveloped Project Management Office. These operation procedures were developed to clearly define the responsibility of the PMO and the process under which projects will be managed. This will allow for a continuous detailed record of previous projects to develop the best possible project management practices, which will increase productivity and efficiency and decrease operational cost. This will also result in the passing on of knowledge to less experienced engineers through the vast documented ledgers.

SOP:

1. Project Initiation: First step of a project is to initiate it.
 - a. Project Selection: Choose a project based on a pre-determined method such as numerical, ranking methods, economic methods or optimization methods
 - b. Balance Portfolio: Choose projects that would fit towards the strategic plan of the organization as well as balancing the Project portfolio.
 - c. Establish a Focus Statement to clearly define and communicate the customer's needs.
2. Project Planning: The most critical phase of the project.
 - a. Scope Planning: **Every PM** shall clearly define the scope utilizing different tools such as a Focus Statement and Scope Statement.
 - b. Team Development: Each Team will be identified by the PM after the scope has been defined. The PM may choose to utilize one or all of the tools for Team Development.
 - i. Four-Stage Model of Project Team Building (Optional)
 - ii. Stakeholder Matrix (Optional)
 - iii. Skill Inventory (Optional)
 - iv. Commitment Scorecard: **Every PM** shall require a Commitment Scorecard to evaluate potential associates.
 - c. Schedule Development: The project manager shall work with his team to develop the schedule utilizing one or some of the scheduling tool.
 - i. Work Breakdown Structure (WBS): **Every PM** shall establish a WBS with the help of their associates.
 - ii. Gantt Chart (Optional)
 - iii. Critical Path Method Diagram (CPMD) (Optional)

- iv. Time-Scaled Arrow Diagram (Optional)
- v. Critical Chain Schedule (Preferred but Optional)
- vi. Hierarchical Schedule (Optional)
- vii. Line Balance (Optional)
- viii. Responsibility Matrix: **Every PM** will establish a responsibility matrix after establishing the WBS. The PM shall assign his associates responsibilities based on the activity.
- d. Cost Planning: **Every PM** shall complete at least one Cost Analysis with the help of his associates.
 - i. Cost Planning Map (Optional)
 - ii. Analogous Estimate (Optional)
 - iii. Parametric Estimate (Optional)
 - iv. Bottom-Up Estimate (Optional)
 - v. Cost Baseline (Optional)
 - vi. Earned Value (Preferred but Optional)
- e. Risk Planning: **Every PM** shall assign activities for each associate to complete a risk analysis.
 - i. Risk Response: A PM may choose to develop a risk response plan. (Preferred but Optional)
 - ii. Monte Carlo Analysis: A PM may choose to develop and utilize a Monte Carlo Analysis. (Optional)
 - iii. Decision Tree: A PM may choose to develop a Decision Tree. (Optional)
- 3. Implementation: Project Implementation takes place
 - a. Scope Control: If necessary **Every PM** shall utilize at least one of the provided tools to control scope.
 - i. Change Coordination Matrix
 - ii. Project Change Request
 - iii. Project Change Log
 - b. Schedule Control: **Every PM** shall at least develop of the schedule control tools.
 - i. Jogging Line (Optional)
 - ii. B-C-F (Baseline-Current-Future) (Preferred but Optional)
 - iii. Milestone Prediction Chart (Optional)
 - iv. Slip Chart (Optional)
 - v. Buffer Chart (Preferred but Optional)
 - vi. Schedule Crashing (Optional)
 - c. Cost Control: **Every PM** shall at least develop a cost control analysis.
 - i. Earned Value Analysis: A PM may choose to develop an Earned Value Analysis. (Preferred but Optional)
 - ii. Milestone Analysis: A PM may choose to develop a Milestone Analysis. (Optional)
 - d. Quality Control: PM are advised to utilize one of the provided tools to control quality.

- i. Quality Improvement Map (Optional)
 - ii. Pareto Chart (Optional)
 - iii. Cause and Effect Diagram (Optional)
 - iv. Control Charts (Optional)
4. Closure: **Every PM** shall develop a performance log, including the provided items, to be handed at the end of the project.
 - a. Risk Log
 - b. Summary Progress Report
 - c. Postmortem Review

Phase 3: Continuous Improvement

This phase emphasizes on the continuous improvement of PMO:LIVE and how it may serve the organization as a whole. Surveys and milestones are developed and will be provided to test and evaluate the rate of improvement that the PMO has established. Although this phase is a continuous phase that would exist throughout the life of the PMO. It is key to be able to determine a rudimentary measurable metric that will allow for the measurement of the progress of the PMO.

SWOT

Strength

1. Should allow for a better and smoother process in managing and developing projects
2. Would increase possible profit by increasing efficiency and productivity, which should decrease operating cost
3. Would emphasize on the development of a more structured project management system
4. Allows for better control of projects

Weakness

1. Requires time to train employees on the different project management tools
2. It is slow to start off and introduce the system to the employees
3. It is time and effort consuming to develop a rollout plan that would minimize any risk in productivity.

Opportunities

1. Easier resource management
2. Allows for a better collaboration
3. Easier progress tracking of projects
4. integrate with different department allowing for interdepartmental collaboration project management
5. Possible future use to implement internal regulatory measures and establishing a structured change programs such as organizational change management

Threats

1. Employee resistance
2. Lack of understanding of the PMO's role within an organization
3. Lack of authority given to PMO to overlook projects
4. Management resisting the need to spend money on developing the program
5. Could lose excitement as time passes by in developing such a project

Phase 4: Project Management Office Implementation

After determining the standard operation procedures and a quantifiable metric to be able to hold the PMO accountable for. The implementation phase will start with the establishment of the office. Starting off with lower end and less experienced project managers to reduce the possible push back from employees and moving up the ladder.

Documentation, Process Improvement and Lessons Learned

PMO: LIVE documents, categorizes and utilizes a 'Lessons Learned' approach to team and project improvement. It includes regular check-ins at team project meetings with line items: 'Lessons Learned This Week? (or Month?)'. Regular review and discussion by team is valued. This interaction is can be modeled and facilitated by Case Managers initially.

A project journal, much like a ships log, is also maintained as a record of process, scope changes, and lessons learned, etc. At key points in each project (30%, 60%, 90%, 100%, 110%) lessons learned are summarized in the VPMO system. A sample format:

LESSONS LEARNED FROM THIS PROJECT

These lessons are categorized by project knowledge area and descriptions, impacts, and recommendations are provided for consideration on similar future new construction projects. It is important to note that not only failures or shortcomings are included but successes as well.

| Category | Issue Name | Problem/Success | Impact | Recommendation |
|----------------------------|-----------------------|---|---|--|
| Procurement Management | Contract Requirements | The PM was not fully engaged in the contract process. | All requirements were not included in the initial contract award. A contract modification was required which added a week to the project. | PM must be fully engaged in all contract processes. This must be communicated to both PM and contract personnel. |
| Human Resources Management | Award Plan | There was no plan for providing awards and recognition to team members. | Toward the end of the project morale was low among the project team. There was increased conflict and team members | The PM should institute and communicate an awards/recognition program for every project. |

| | | | | |
|--------------------|-------------------|--|---|--|
| | | | were asking to leave the project. | |
| Scope Management | Scope Creep | Stakeholders continuously tried adding to the project scope throughout the project lifecycle. | The PM did not have a plan for addressing scope creep and allowed some requirements to be added until the sponsor stopped it. Overall project delay of 3 weeks was the result. | The PM must have an approval process for any proposed scope changes and communicate this process to all stakeholders. |
| Quality Management | Building Material | A process for determining acceptable building material quality was planned into the project. | This allowed the project team to work with the contractors to smoothly ensure all materials were of acceptable quality and avoided any re-work and delays associated with substandard material. | Always plan quality standards and allowances into the project plan. This helps avoid delays and cost overruns. |
| Risk Management | Zoning Approval | A risk was identified that there may be delays in receiving approval from the county zoning board. This was a success because it was identified early and planned for. | Impact was minimal because the PM included potential zoning delays into the project schedule. | Always consider external impacts on the project cost and schedule. This must be continuous throughout the project lifecycle. |

Lessons Learned Knowledge Database

The Lesson Learned Knowledge Database contains historical information from previous projects. It is part of the organizational project assets and provides a valuable source of information to be used by similar projects in the future. All project lessons learned and other historical information need to be transferred to this knowledge/database in order to provide one centralized repository for ease of use. This should also include information on issues and risks as well as techniques that worked well which can be applied to future projects. This information will be cataloged under the:

- Project's year (20xx)
- Type of project (New Construction)
- Scale (200,000 SF)
- Cost (\$280M)

This information is be valuable for any project manager assigned to a similar project in the future. Each PM is charged with reviewing the Lessons Learned Database at least twice through a project's duration. This review is on the project checklist. The Case Manager may also suggest examples for their review.

The current CH2M lessons learned knowledge/database on the VPMO contains large amounts of information, catalogued for use. However, the ease of use is an issue that needs to be resolved, as well as the direction to review and learn from it.

Project Close out and Post Project Review

Formal project closeout policy and post project reviews are required. These compare project budgets and schedules to the Actuals one last time, account for change orders and credits back to client (if-any). Also a Formal Project Acceptance Requires a Signature by the Client and Stakeholders as well, ideally. It is the Project Manager's responsibility to release resources during the closing process and ensure that all closing tasks are completed.⁷

⁷ <http://www.projectmanagementdocs.com/project-closing-templates.html#ixzz3cmfgcWnN>

Process Improvement Recommendations

Integrating process improvements is important to continue PMO: LIVE development. The PMO:LIVE office is responsible for this integration into PM process and checklists. For example: If a project does not employ a process for reviewing and approved requested changes in requirements or project scope (a common issue), prior to work beginning on any new project, the project manager must brief the project sponsor on the process for requesting and approving changes to project scope. And document this discussion on the project checklist.

Regularly surveying the project management teams will be important to fine tuning the PMO: LIVE. Below is a sample survey to employ on a quarterly basis at a minimum:

| How Effective is your PMO: LIVE? | | | | |
|--|-----------------------------------|---------------------------------|----------------------------|-------------------------------|
| | Done poorly or not at all 0 | Done somewhat poorly 1 | Done somewhat well 2 | Done well, Completely 3 |
| 1. We have learned to use 'face to face' interaction as much as possible to create WBS, Schedules and Project Budgets | | | | |
| 2. We have consistently followed the Project Management Checklist (or SOP) | | | | |
| 3. We regularly check-in with our PMO: LIVE Case Managers to check on our process | | | | |
| 4. We regularly follow close-out procedures. | | | | |
| Total Score - | | | | |
| Scoring 10-12 You are in great shape! 9-5 Determine what else PMO:LIVE needs and make adjustments 0-5 Focus on the basics: Increase training opportunities and facilitated experiences | | | | |

Summary

CH2M Values project management above many other aspects of their business. After winning awards for Best Project Management in multiple industries⁸⁹ -- we still have to ask, 'Can we do better?' This business case explains one way to do that--with specific targeted goals, real benefits, and a path to go forward.

⁸ <http://www.wateronline.com/doc/ch-m-hill-research-project-wins-iwa-project-innovation-award-0001?user=2894843>

⁹ <http://www.pmi.org/en/About-Us/Press-Releases/Prairie-Waters-Project-Receives-PMI-Prestigious-2011-PMI-Project-of-the-Year-Award.aspx>

Appendix

Project Charter

PROJECT CHARTER

This Charter formally authorizes the CH2M Operations Management Services (OMS) Group to develop and implement a new Project Management Office (PMO: LIVE) for use in its project work. The project plan included in this accompanying report includes: scope statement; schedule; cost estimate; budget; and provisions for scope, resource, schedule, communications, quality, risk, procurement, and stakeholder management as well as project control. All resources will be assigned by Tom Rodman, OMS Manager.

Project Goal - Improve product delivery, consistency, and profitability, ensuring client satisfaction and recognition for project management services while building competencies on the project management team 'bench'. This project seeks to eliminate the confusion regarding tools available on its virtual PMO and improve the usage of project management tools across the board. There are strong training, facilitation, and PM accreditation components. This project serves furthermore as a test case with the expectation that the methods achieved by it can be used in other groups within CH2M. The project deliverables shall include:

- PROJECT CHARTER
- GAP ANALYSIS: EXISTING METHODS
- VALUE PROPOSITION
- RISK RESPONSE PLAN
- PM TOOLBOX AND REVAMP OF VIRTUAL PMO
- METRICS FOR VALUE ADDED MEASUREMENT
- NEW STANDARDS FOR DOCUMENTATION?
- POLICIES FOR USAGE (ie: PROJECT FACILITATION?)
- TRAINING AND CREDENTIALLING PROGRAM
- PMO: LIVE ROLL-OUT
- PMO:LIVE EVALUATION

The objects of this project is to reduce project costs by 2-5% and improve project delivery by an average of 10 workdays routinely.

High level risks for this project include ensuring implementation is completed without impacting ongoing control systems, including payroll and project billing cycles; and current usage of the virtual PMO. These risks may be managed by running parallel tracked systems. Mid-Level risks are related to cultural adoptions,

reluctance to train and resistance to change. These management of these perceptions are a key aspect of the roll-out plan.

Success will be determined by the Project Sponsor once the system is implemented for two full years of project work, or a minimum of 10 projects of \$200K or more, have been initiated and completed under this program. Metrics related to actual schedule and project cost to proposed, along with surveys of users will be compiled to compare against past documented project histories has been completed that meets the objectives with no discrepancies.

The Project Manager, Tom Rodman, is hereby authorized to interface with management as required, negotiate for resources, delegate responsibilities within the framework of the project, and to communicate with management, as required, to ensure successful and timely completion of the project. The Project Manager is responsible for continuing the project plan, monitoring the schedule, cost, and scope of the project during implementation, and maintaining control over the project by measuring performance and taking corrective action. The continuing operation of the PMO: LIVE will be determined after a review by Corporate Management Team based on the performance metrics resulting from this Project.

The project plan herein submitted is approved in accordance with the milestone schedule below. Upon approval of the project plan resources will be assigned to the project and work will commence within 5 business days. The Project Sponsor must approve any schedule changes which may impact milestones. A detailed schedule will be included in the project plan. The high level milestone schedule is:

July 13, 2015 – Project Plan Complete and Approved

Aug 17, 2015 -- PMO:LIVE staffing in place
and physical office created

Sep 14, 2015 – Survey #1 of PMs completed,
Training Programs identified,
Roll-out Plan completed

Oct 1, 2015 -- PMO: LIVE official Roll-out,
Case Managers available to PMs
Training Sessions scheduled

Dec 1, 2015 -- Survey #2 of PMs completed

Jan 1, 2015 -- Project evaluation underway
Project adjustments made

Jan 17, 2016 -- Implementation Completed

Oct 15, 2016 – Project Completion anticipated

PMO: LIVE Evaluation

PMO: LIVE go-no go Program Continuation.

Generate Budget for continuation of program operations

July 13, 2017 -- Latest Project Finish possible.

The budget for the PMO:LIVE Project is **\$820,000** for the maximum two year duration. It is to be funded through the OMS Training and Technology Budget. The budget for an ongoing program

Sponsor Acceptance

Approved by the Project Sponsor:

_____ Date: _____

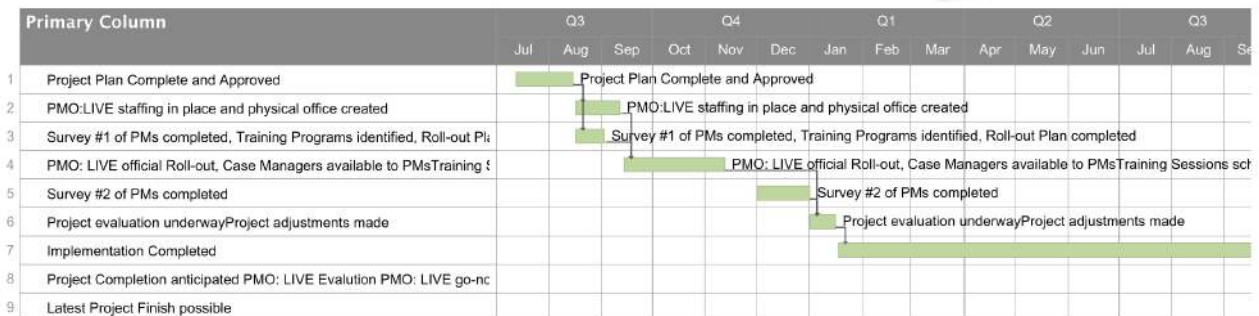
<Greg McDonald>

Corporate V.P.>

[Pseudonyms used]

GHANTT CHART

PM Tools



WBS (Work Breakdown Structure)

- 0.0 PMO:LIVE
 - 1.0 PROJECT CHARTER
 - 1.1 INTERVIEW LEADERSHIP
 - 1.2 DETERMINE 'CHAMPION' FOR EFFORT
 - 1.3 DEFINE GOALS
 - 1.4 GAIN SPONSOR BUY-IN
 - 1.5 PLAN REGULAR PROGRESS REPORT/MEETING
 - 2.0 PMO OFFICE
 - 2.1 EVALUATE ORGANIZATION CULTURE
 - 2.2 EVALUATE PERSONNEL FOR INCLUSION
 - 2.3 CREATE ORG CHART
 - 2.4 DETERMINE LOCATION OF PMO
 - 2.5 STUDY BARRIERS TO ADOPTION
 - 2.6 EVALUATE IN TERMS OF PMBOK
 - 2.7 DETERMINE PROPOSAL FORMAT
 - 3.0 EXISTING METHODS AND SUCCESS RATE
 - 3.1 EVALUATE ORGANIZATION CULTURE
 - 3.2 EVALUATE ACCESSIBILITY TO STANDARDS
 - 3.3 EVALUATE EXISTING VIRTUAL PMO
 - 4.0 VALUE PROPOSITION
 - 4.1 IDENTIFY EVALUATION METHODS
 - 5.0 RISK RESPONSE PLAN
 - 5.1 EVALUATE TOOLS FOR RISK ASSESSMENT
 - 5.2 DETERMINE BEST TOOL
 - 5.3 IMPLEMENT RISK TOOL USE
 - 6.0 PM TOOLBOX
 - 6.1 DEVELOP PROPOSAL FORMAT
 - 6.2 DEVELOP WORK BREAKDOWN TOOL
 - 6.3 DEVELOP TEAM CHART FORMAT
 - 7.0 METRICS FOR VALUE ADDED MEASUREMENT
 - 8.0 NEW STANDARDS FOR DOCUMENTATION
 - 9.0 POLICIES FOR USAGE
 - 10.0 TRAINING PROGRAM
 - 10.1 DEFINE GOALS
 - 10.2 TRAIN TRAINERS
 - 10.3 TRAIN PMs
 - 11.0 PMO ROLL-OUT
 - 11.1 CREATE MARKETING PLAN
 - 11.1.1 CREATE BUDGET FOR ROLL-OUT
 - 11.1.2 DESIGNATE ROLL-OUT TEAM
 - 11.1.3 DEVELOP MARKETING MESSAGE

- 11.2 DESIGNATE MEDIA AND SUGGEST PLAN
- 11.3 CREATE MARKETING MATERIALS
 - 11.3.1 CREATE FLYERS (INCL. VIRTUAL)
- 11.4 PLAN ROLL-OUT ACTIVITIES
- 11.5 IDENTIFY METHOD (GROUP PRESENTATION OR VIRTUAL OR BOTH)

12.0 PMO ASSESSMENT

- 12.1 MEET WITH PARTICIPANTS IN A FACILITATED SESSION
- 12.2 SURVEY PARTICIPANTS AND STAKEHOLDERS
- 12.3 EVALUATE PROJECT CLOSEOUT DOCUMENTS
- 12.4 MEET WITH CONTROLS TEAM TO ASSESS GAINS
- 12.5 FASHION RECOMMENDATIONS TO MANAGEMENT
- 12.6 MEET WITH MANAGEMENT AND PROPOSE RECOMMENDATIONS