

Paper 109-30

Effective Project Management of SAS® Projects

Adapting the PMI Framework

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ABSTRACT

Many studies have shown that a significant reason for the failure of business intelligence projects is not failure of the technology, but rather inappropriate project management including lack of integration, lack of communication and lack of clear linkages to business objectives and to benefits achievement. Many best practices have evolved to help project teams deal with these issues. One such standard or guide is the Project Management Institute's "Project Management Body of Knowledge®," or PMBOK®.

In this paper, we will explore the application of the Project Management Institute's PMBOK® Guidelines to projects that use SAS® Software to deliver business intelligence, CRM or other related types of complex cross organizational business initiatives that are commonly highly iterative. This paper is designed to meet the interests of both information technology professionals and business representatives. It is useful for project managers, business analysts, developers, and business subject matter experts.

INTRODUCTION

Whether you are embarking on a customer relationship management initiative, a balanced scorecard implementation, data mining project, a risk management system or other business intelligence applications, there is a large body of knowledge about what factors contributed the most to the failures of these types of initiatives. We, as an industry, need to leverage this knowledge and learn these lessons so we do not repeat them in our own projects and we need to share these lessons with our peers for the benefit of the profession.

The PMBOK® stated purpose is to "identify and describe that subset of the PMBOK that is generally accepted" and to "provide a common lexicon within the profession and practice of talking and writing about project management,"

While most components of the PMBOK® Guidelines can be applied and are very beneficial when managing a highly iterative project, we will focus in this paper on the top 5 tools and techniques of Project Management Best Practices that all Project Managers managing SAS® Software projects should use for maximum effectiveness.

THE CONTEXT

PRODUCT VS. PROJECT LIFECYCLE

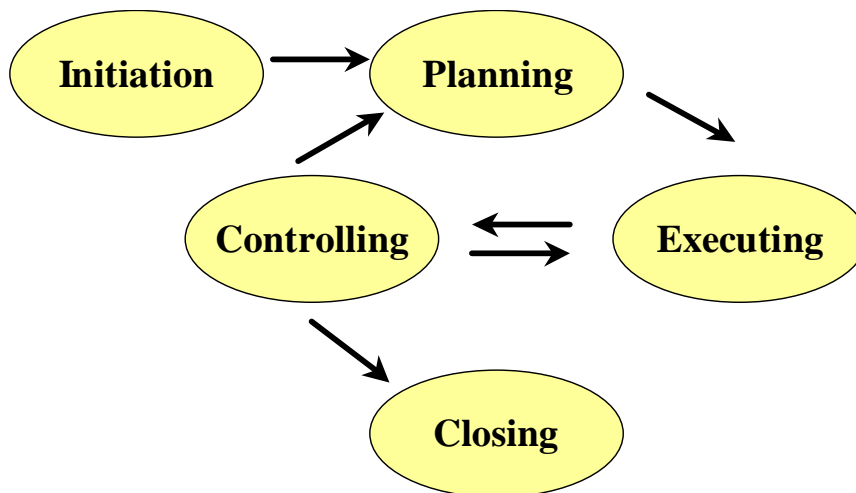
In order to effectively apply project management to the development of a business intelligence project, you must understand the difference between a *product* lifecycle and a *project* lifecycle and find strategies to seamlessly integrate them both.

The *product* lifecycle is specific to what you are building; for example, the specific steps for implementing a new systems infrastructure are different from the steps for building a data mart. These may contain multiple phases, such as requirements, design, construction and maintenance, which are frequently executed in an iterative fashion in business intelligence projects. Alternatively these can be iterations or concurrent phases. In addition to these types of lifecycle phases, a fully integrated product lifecycle may extend from the conceptual stages right through to the benefits realization stages. Many organizations have developed, through experience, their own product lifecycles and in fact these expanded product lifecycles may be managed as a multi year program.

The *project* lifecycle, on the other hand, focuses on managing the work that is required to produce the deliverables and accomplish the objectives of the product. Generally speaking, the project lifecycle could be very similar for various types of projects and relates to the need to have established controls for confirming scope, managing and controlling the work, reporting performance, and other elements of management.

The generally accepted project lifecycle includes five process groups, which according to the Project Management Institute's (PMI) Project Management Body of Knowledge (PMBOK®) are: initiate, plan, execute, control and close. These process groups are comprised of sub-processes, which may be repeated many times over the course of the project as required. The general flow of the process groups is illustrated in Figure 1. For example, depending on the results of inspections or audits during the Controlling processes, the project manager may need to 're-plan', continue with execution, or close the project.

The best way to conceptualize how the PMI framework can be applied to a business intelligence project is to think of those five process groups as a 'micro' process within each major phase or iteration of your project. This means that the full project life cycle will be traveled at each phase as illustrated in Figure 2.



Project Management Institute, Project Management Body of Knowledge (PMBOK®)

Figure 1 - Reproduced with Permission of the Project Management Institute

For example, if you conduct a mini-project initiation at the start of each phase or iteration, you will revisit the project objectives to ensure they are still accurate, you will ensure everyone has a common understanding of the goals of the project, and you will energize the team by introducing mini-kickoff activities. By conducting a mini-close out at the end of each phase (such as design), you will ensure that lessons learned are captured while they are fresh and thus you will be able to apply these lessons to the next phase and enhance the odds of success of your own project.

Requirements	Design
<p>Initiation Planning Execution & Control Closing</p> <p><i>Example:</i></p> <p><i>Initiation at this stage may involve getting approval on the project objectives and securing funding and resources to begin the requirements process in detail.</i></p> <p><i>Planning may not be detailed for future iterations or phases and may be elaborated as more is known.</i></p>	<p>Initiation Planning Execution & Control Closing</p> <p><i>Example:</i></p> <p><i>At this stage, thinking of 'initiation' brings the question of 'shall we continue' with this project' or 'are the stakeholder critical objectives and vision still aligned'</i></p>

Figure 2

Many organizations have developed their own methodologies, however many of them are focused on the steps to create the product and do not pay due attention to the project life cycle. This leads to scope issues, ineffective communications, lack of expectations management and lack of focus on the business objectives.

INTEGRATION AND INITIATION

An integrated plan is imperative for a business intelligence project or program. One potential pitfall that prevents organizations from realizing benefits is the view that a business intelligence project is an IT project. Often there is an assumption that business changes and culture changes would fall into place naturally and that benefits would be achieved.

The trend for the 21st century is to manage portfolios of projects through their entire lifecycle from concept to benefits achievement. The 'Initiation' process is where we formally recognize that a new project exists or that an existing one should continue to its next stage. The vision for the project is developed, key goals are established, leadership for the project is selected and a project charter is issued. The project charter sets the stage for the direction of the project and its vision.

Before proceeding with a business intelligence project, you should undertake a readiness assessment. Conducting this assessment will assist in making the decision as to whether or not to approve this project at this time. This should be done as part of the project selection process. If there is sufficient readiness to proceed, any areas that have received lower "marks" will serve as excellent input into your project risk management plan.

One of the most critical aspects of readiness is the degree of business sponsorship. It is the business sponsor who defines the business vision, determines the business impacts this project will have and facilitates the necessary resources. These objectives set the foundation and the baseline upon which project decisions will be made throughout the project. A second critical aspect of readiness is the degree of organizational readiness for change. This is where organizations begin to visualize the entire portfolio of projects as a whole to determine impacts at the deployment and acceptance stages.

TOP FIVE WEAPONS

In today's markets of tougher competition and ever-changing technology, project uncertainty and risk escalate tremendously. The nature of many of your projects is such that the effect of a bad implementation can have disastrous consequences on the business. Industry experts conclude that inadequate planning presents the greatest threat to any business intelligence initiative.

In the remainder of this paper, we will explore 5 key tools and techniques from the PMBOK® best practices and how they can be applied to your projects for increased success. You should recognize that these techniques could be applied not only to the entire project but also to individual deliverables. For example, if your role is not the overall project manager; however you have accountability for delivering a specific work product then you can benefit from managing your own work and time through the use of Project Management best practices.

- #1 – Risk Management
- #2 – Communications Planning
- #3 – Roles and Responsibilities Definition
- #4 – Lessons Learned
- #5 – Organizational Change Management

#1 - RISK MANAGEMENT

The Project Manager could be considered a Risk Manager. The first thing we must remember is that all project management *is* Risk Management. Every technique of formal project management and even the discipline of project management itself is a risk mitigation technique (e.g. scope planning, work breakdown structures, communication plans, stakeholder maps, etc.). Your job as a project manager is to make decisions that reduce the risks associated with your project while keeping focused on the goals. Risk management also provides the chance to better understand the nature of the project at hand and to involve team members early. In a nutshell, risk management is a formal process that according to the PMBOK® is comprised of risk identification, risk analysis (qualitative and quantitative), risk response planning, and risk monitoring and control.

Experience in many business intelligence projects reveals poor performance in terms of reaching scope, quality, time and cost objectives. Many of these shortcomings are attributed either to unforeseen events, which may or may not have been anticipated by more experienced project management, or to foreseen events for which the risks were not fully addressed. Failure to give proper recognition to risk management on a project can lead to unnecessary and often substantial losses, or even complete project failure. Perhaps one of the biggest impediments is that of management's attitude to risk itself. In many cases inherent risks are simply optimistically ignored when higher

chances of project success are reached by facing these issues. For many project managers and sponsors this may also represent a new way of thinking.

Contrary to many beliefs that the application of formal project management frameworks such as PMBOK® to highly volatile and iterative projects slows down the project, the methods are a requirement for success and what varies in such as project is the way in which the method is applied. Risk management *concepts* and principles are common regardless of whether the project is a business intelligence implementation, or construction of a bridge.

The differences are in terms of the common application of risk mitigation techniques, availability of lessons learned, application-specific risk profiles, and industry-specific risk profiles. Below in Figure 3 is an example of question that may be included in a Risk Profile for a project; and the answers could be scored in such a way that a risk score for the project overall can be calculated.

<i>RISK PROFILE QUESTIONS EXAMPLE</i>
<i>Customer or Users</i>
Will business customer change current business processes to incorporate the new warehouse?
Will the project necessitate reorganization in the business units?
Are users in different departments?
Will there be dedicated user/business representatives available for the project team?
Have business users been educated on the objectives of the project?
<i>Team Membership</i>
What percent of the team is fully dedicated to the project?
Is the project manager dedicated to this project?
What is the experience level of the team?
Have the team members worked together before?
Is the team spread out geographically?
Which team members will spend less than 30% of their time working on this project?
Have team members received education on business intelligence fundamentals?
Have any team members been part of a prior DW project?

Figure 3

The status of risk on a business intelligence project also varies significantly during the course of its lifecycle. The most effective time for achieving the greatest impact on project results is early on in the lifecycle. The period of highest vulnerability to risk occurs during the last phases of your business intelligence project due to the degree of investment to this point and due to the levels of expectations generated.

Once you have identified the risks associated with the project, you should analyze them in terms of monetary impact and likelihood of occurring. Below is a simple quadrant method to help teams plot the various risk events, prioritize, and identify strategies to respond to the most important risks. In Figure 4, you can see the types of strategies that you may choose to take with the risks that are plotted onto each quadrant. For example, it stands to reason that risks that have a High Likelihood of occurring (based on historical knowledge) and could have a high (negative) impact on the project are high priority risks that need a proactive strategy for either reducing the impact or reducing the likelihood of the risk event and not simply a 'plan B' or 'contingency' strategy.

This type of risk analysis is best done with the core team in a workshop setting. This has the value and added benefit of opening vehicles of communication about the project and developing a more in-depth understanding of what is to come and what the team needs to address in order to be successful.

	Not Very Likely	Very Likely
Major Impact	<i>Should have a risk strategy</i>	MUST put a strategy in place not only to respond to these risks, but to mitigate them from the start
No Major Impact	<i>Do not spend time on these</i>	<i>Keep your eye on these in case their 'no impact' assessment changes.</i>

Figure 4

The goal of risk management is to identify project risks and develop strategies that either significantly reduce them or take steps to avoid them altogether. It involves planning, which minimizes the probability and negative effects of things going wrong, and carefully matches responsibility and strategies to residual risks that remain in the project. It is a very proactive and creative process.

#2 - COMMUNICATIONS PLANNING

Probably the most neglected aspect of a business intelligence project is keeping everyone informed. This includes the project team as well as the sponsors and end-user representatives. Periodic formal and informal communications should be an integral part of every business intelligence project plan, especially large business intelligence projects. It is very important to recognize that it is people who complete projects and that success is a result of people committing to goals and meeting them.

To be successful, you must have the ability to come to agreement, coordinate action, recognize and solve problems, and react to changes. This requires effective and consistent formal and informal communication techniques. The right communication vehicles must also be matched to their appropriate messages.

When ... What ... How ... Who...	Weekly Progress Meetings In-Person	Monthly Program Bulletin Hardcopy	Weekly Progress Reports E-mail	Monthly Exec Summary E-Mail
	<ul style="list-style-type: none"> • Task updates • Specific Issues • Quality update 	<ul style="list-style-type: none"> • Progress • Achievements • Achievements planned for next month 	<ul style="list-style-type: none"> • Progress summary • Variances • Achievements • Planned achievements • Red Flags, Issues 	<ul style="list-style-type: none"> • Overall progress • Achievements vs. planned • Resource issues
Sponsor		R	R	R
Project Mgr	R	R	O/A	O
Project Team	R	R	R	R
Subsidiaries Senior Mgmt		R		R
Business Unit Managers		R		R

Figure 5

The communication plan shown in Figure 5 is an example of how you might begin to visualize how your project communications will flow. The communications plan is a technique recommended by PMBOK® to answer the question of who gets what information and when. By creating a communications plan in the early planning stages of the project, you may in fact raise some degree of conflict over expectations and involvement. This is very productive because if the conflict is there, it is less expensive to resolve it earlier rather than later. This is also where you start to learn stakeholder preferences and style so that you can manage your stakeholders effectively.

Business intelligence projects are generally very expensive, involve a lot of resources over a long term and include many activities that are not familiar to sponsors, end users or developers. This being the case, a well-executed communications plan mitigates many of the issues associated with inefficient or inadequate communications.

#3 ROLES AND RESPONSIBILITIES ASSIGNMENT

An area of increased attention is determining and communicating who is in charge of what tasks and responsibilities. You can easily sort this out with a simple responsibility and accountability chart. In my experience, if you can communicate what you want on one sheet of paper the chances of it getting read and used increases tremendously. This chart is known as the RAM (Responsibility Assignment Matrix) in the PMBOK®. This type of chart may also be known as a RACI chart by many of you.

Just list the deliverables (or tasks) that need to be done and then assign an R, A, C or I to people involved. Here are the commonly used definitions.

	Stakeholder	e.g. Project Manager	e.g. BA	e.g. Chief Arch	e.g. Sponsor
Interim Deliverable					I
Requirements		S	R	I	A
Architecture		C	C	A	C
Interface Design		C	R	C	A

R = responsible **A** = approves **C** = consulted **I** = informed

Figure 6

R — Responsible: There must be at least one R for every process/function. There can be more than one R and it can be the same person as the A. This person/people are responsible for carrying out the process/function. They are the “doers.”

A — Accountable or Approver: “The buck stops here.” It is recommended that each item only have one individual Accountable while there may be shared responsibility in some cases. The more complex the project, the more likely you may have more than one “A”. This situation in itself increases risks of delays and long approval cycle time.

C — Consult: There can be any number of Cs or none. The C person/people need to be consulted before a decision is made. Their input is required before moving forward. Generally speaking people impacted by the results should be consulted in some level for maximum buy-in of the results.

I — Informed: There can be any number of Is or none. The I person/people are members of the team that need to be informed of what's being done. They don't provide input, but do have a need to know what's happening. Perhaps their duties are impacted by what other people do.

Imagine a basketball team on which no one knows what position they're supposed to play or what needs to be done.

The players are skilled, but they're just not sure how to use their skills to win the game. If are leading a project team, it's the last thing you want to deal with. Making sure that team members understand their roles and responsibilities for a project is a basic building block of your success.

It can be said that it takes a team to deliver a project.... But a team that lacks focus and direction will have a much rougher road to success. Within a project, assigned "roles and responsibilities" define the physical relationships between the project team and the work that has to be done.

#4 – LESSONS LEARNED

A particularly key process in business intelligence is effective closing and recording of lessons learned. As long as project teams believe that each individual project is completely unique, they will fail to gain from lessons learned. The PMBOK® Guideline has a very strong emphasis on lessons learned and in fact the concept of 'historical databases' appears more than 200 times in the guideline.

Since business intelligence projects are highly iterative, we must ensure that lessons learned from early iterations are recorded and reviewed. It is also imperative for organizations to recognize the benefits that can be realized by gathering lessons learned from one iteration, or sub-project, and applying them to future projects.

Start	Stop
Continue	More of
	Less of

Figure 7

Figure 7 above illustrates an easy template that you can use throughout your project with the team to identify areas of improvement and ways in which the team can be more effective.

The Pareto Principle, which is addressed in the Quality Management knowledge area of the PMBOK® states that outputs do not arise proportionately from inputs. There is a natural imbalance. For any activity 20% of the resources employed (materials, people, time, effort, etc.) leads to 80% of the outcomes achieved. Therefore, if we can identify

what those 20% of resources are and concentrate our efforts on these, we can achieve much more than can initially be anticipated. In short, the Pareto Principle advocates simple solutions over complex ones, quality over quantity, and selective action over extensive effort. One of the ways in which we can begin to capture sufficient quality information to discover that 20% is by consistently capturing effective lessons learned, disseminating them across the organization, and referring to them when starting new iterations and projects. Lessons learned can come in the form of defect analysis logs, post project reviews, minutes and issue logs, risk logs, project performance management, and quality audits.

I have heard it said that a good project manager resembles the entertainer who keeps numerous plates spinning on the end of long poles by dashing around frenetically from pole to pole. One could disagree with this as eventually the plates will one by one fall off. The effective project manager is much more likely to appear calm and in control. The application of the Pareto Principle as outlined in this paper will help you to practice effective project management by helping you to prioritize on the most effective practices and on the most important dimensions.

#5 – ORGANIZATIONAL CHANGE MANAGEMENT

One area that the PMBOK® guidelines do not sufficiently address is that of effective management of change in an organization. In my experience, project managers of business intelligence projects, must pay due attention to the people side of change and develop effective strategies to deal with the issues of resistance and change.

One of the most useful models for thinking about change is the ADKAR model was published in 1999 (by Prosci) after research with more than 700 companies undergoing major change projects. To use the ADKAR model effectively, you need to understand the underlying framework for change initiatives. Change happens on two dimensions: the business dimension and the people dimension. Successful change happens when both dimensions of change occur simultaneously.

The business dimension of change includes the typical project elements.

- Business need or opportunity is identified.
- Project is defined (scope and objectives).
- Business solution is designed (new processes, systems and organizational structure).
- New processes and systems are developed.
- Solution is implemented into the organization.
- These are the standard elements of a business change that managers feel most comfortable managing.

People dimension of change

The people dimension of change is how employees experience the change process. Effective management of the people dimension of change requires managing five key phases that form the basis of the ADKAR model:

Awareness of the need to change

Desire to participate and support the change

Knowledge of how to change (and what the change looks like)

Ability to implement the change on a day-to-day basis

Reinforcement to keep the change in place

“It must be remembered that there is nothing more difficult to plan, more doubtful of success, nor more dangerous to manage than the creation of a new system. For the initiator has the enmity of all who would profit by the preservation of the old institution and merely the lukewarm defense in those who would gain by the new ones” – Machiavelli (The Prince, 1513).

CONCLUSION

Business intelligence projects are full of uncertainty. The risk management techniques discussed is a first step in managing that uncertainty and in increasing the odds of successful business intelligence projects. It is also

imperative that the right communications and responsibilities plan is used to assist with expectations management and to set the stage for a successful project. Finally, without an effective method of capturing and using lessons learned, you will not continuously improve your processes as your project and product evolve.

While the PMBOK® is viewed by some practitioners as inflexible for the needs of iterative and evolutionary projects such as you might undertake with SAS® Software, the reverse is in fact the case. By adjusting how you apply the PMBOK® guidelines, you can add a great degree of control to projects that are seemingly full of change. The key concept that we have discussed in this paper is that of thinking of the PMBOK® process groups of initiating, planning, executing, controlling, and closing as repeating themselves within each iteration, version, or phase of your project. This allows you to leverage the significant experience and lessons embodied in the project management best practices while adapting to the needs of your projects.

Good project management can make the difference between a successful and a disastrous business intelligence implementation. It is naive to believe that since business intelligence or similar projects are different than operational systems, we don't have to concern ourselves with project plans, schedules, resources, risk, scope, and change. The projects that will succeed are those that have good project management.

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