

Too many times, Business Intelligence (BI) and Data Warehousing project managers are ill-equipped to handle their role in guiding a project to success. Often, the person slated to lead a project is either: 1) a technician who doesn't know the first thing about managing a project, or 2) a project manager who doesn't know the first thing about BI.

This paper introduces Business Intelligence to the pure project manager and introduces project management concepts to the BI practitioner in the context of an example project.

ABOUT ANALYTICS8

Analytics8 is a business intelligence (BI) and data warehousing enablement and optimization consulting firm. Though we are experts with many tools and technologies, we never lose sight of the business reasons for implementing technology.

Let us show you how to make the most of your data.

A BI Primer

Before getting started, we need to make sure we understand BI at a high level.

Making the most of an organization's data assets is the purpose of BI. Companies can gain a competitive advantage like increasing revenue, reducing costs, or reducing risks by making better data-driven decisions through a well-built BI system.

The diverse business applications of a BI system can be critically important to an organization. For example:

- **Customer Profitability:** 20% of your customers make up 80% of your profit. Which customers are they? Which customers cost more money than their worth? A major Telco company let go of many customers after they conducted such analysis by building a profitability data mart.
- **Increase Sales:** A major automotive company had difficulty reporting on part sales because there were multiple channels with different data sources. Once they built a BI system, they were able to see which parts were selling and where. With that knowledge they created (and tracked) marketing programs and competitive pricing programs to increase profitability.
- **Improve Patient Care:** A regional healthcare provider with 20 hospitals needed a way to compare and report on clinical performance across all hospitals down to a patient-level. They built a BI system to allow that capability through a web-enabled dashboard while maintaining patient privacy and HIPAA standards.

The technical means of building a BI system is to:

- 1) identify and collect the data that resides in various internal and potentially external sources
- 2) to make that data available for reporting and analysis.

Almost every application in an enterprise collects and stores data, and usually the data will reside in a relational database, but could also be stored in other formats. A diagram of a typical BI system is shown in **Figure 1**.

The two main advantages of typical BI architecture are:

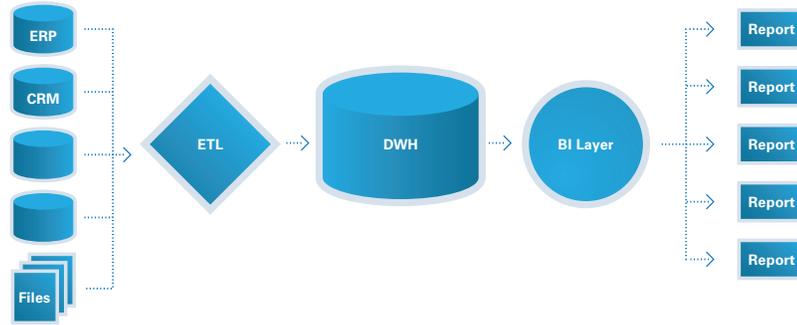
1. Reporting from multiple systems is possible.
2. The data is stored and structured in a way that makes reporting easy and fast.

Reporting directly on source system data is called **operational reporting**, and is often included in a BI project.

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FIGURE 1: TYPICAL BI SYSTEM

The diagram shows data flowing from left to right. On the left are multiple source systems, which often include Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM) data.



Most BI projects will have an Extract, Transform, Load (ETL) component. ETL refers to the technologies that move data between systems. All projects with an ETL component will need to consider how to handle data of dubious quality. Often separate **data cleansing** software is used.

The data supporting a BI application resides in the **Data Warehouse (DWH)**. Though most modern BI tools can report from many sources and many types of data, the most common source is still the data warehouse. Some projects will report from **data marts**, which are smaller subsets of a DWH, or an **Enterprise Data Warehouse (EDW)** which is a data warehouse that attempts to include all important data for a company or enterprise. The structure of the tables in the DWH is the **data model**, and is the most important component of any BI system.

The diagram shows a “BI Layer” between the DWH and the reports. Different tools call this layer by different terms: project, universe, catalog, cube, framework, or semantic layer. Depending on the tools used, this layer is either an abstraction of data stored within the DWH, or a copy on disk or memory (often in a proprietary format) that allows easy, fast, and consistent reporting.

The reports themselves are usually fairly straightforward to build once the data has correctly been loaded into the DWH and the BI Layer has been properly built. The “trivializing” of report building is one significant benefit of BI. The goal of many BI projects is to enable business people to build their own reports and do their own analysis rather than leaving the report-writing to IT.

The Project Management Institute Process Groups

“Process Groups” as defined by the Project Management Institute are stages used to manage a project (or “phase of a project”) and are independent of the specific delivery methodology (waterfall, agile, etc.). A single project may cycle through process groups multiple times depending on how the project is structured and what kind of challenges the project encounters.

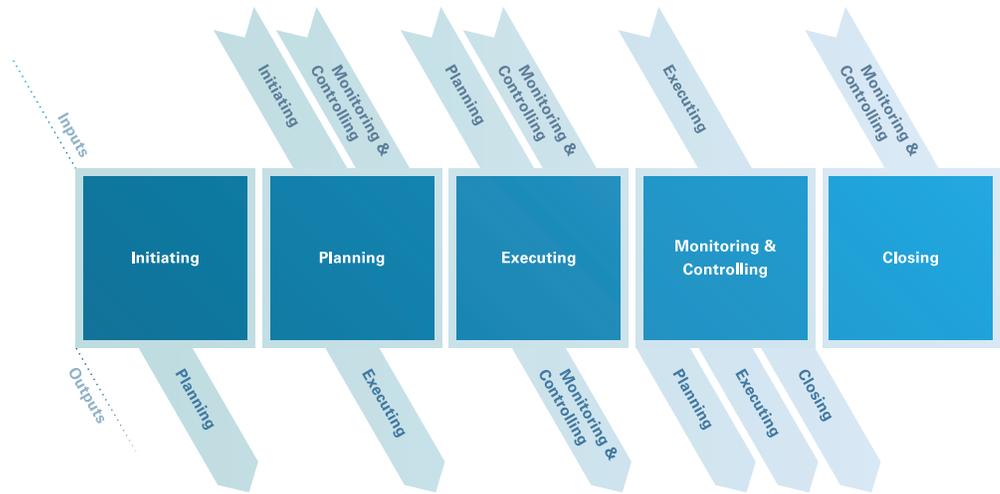
The five process groups are (see **Figure 2**):

- **Initiation:** This is the first process group and acknowledges the project, or the next phase in an active project, should begin.
- **Planning:** Formulating and revising project goals and objectives and creating the project management plan that will be used to achieve the goals the project was undertaken to address.
- **Execution:** Putting the plan into action, including coordinating and directing project resources to meet the objectives of the project plan.
- **Monitoring & Controlling:** Taking performance measurements and analyzing them to determine if the project is staying true to the project plan.
- **Closure:** Gathering and disseminating information to formalize the end of the project.

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FIGURE 2: PMI PROCESS SYSTEM

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The Project

You have just been assigned as the project manager for an important Business Intelligence project at a large bank. The goal of this project is to enable quicker and more accessible information regarding the financial products sold and to better identify cross-sell and up-sell opportunities for the bank's customer base.

The initial project phase will clearly define requirements and develop a detailed design. Implementation of the system will occur in a later phase.

The bank has identified two key sources of information needed to do the required analysis. They would like to enable "ad-hoc" reporting to its analysts and has further identified 15 required (and complex) standard reports.

For this project, it has already been decided that a data mart approach will be used and the technology (software and hardware) has already been determined based on the company's corporate standards. We have determined that the successful completion of the following deliverables will define project success:

- Requirements document focusing on data elements needed for standard reports
- Logical & physical data model for Data Mart (in an ER modeling tool's format)
- Data mapping document for ETL from two Data sources into the Data Mart
- Design document including system diagrams
- Project plan and scope statement for next phase

It is important to note that a project or phase may go through each of the five process groups once or multiple times. This hypothetical project phase will assume that we will go through each of the five process groups once.

THE BIRD'S-EYE VIEW

A Project Charter typically includes the high level objectives, key stakeholders, high level description of deliverables, benefits, and critical success factors.

Initiation – Get the Project Started!

Now that you understand what a BI project entails and you are familiar with the PMI process groups, it is time to get started. The first task is to put together a draft of the **project charter** with the executive sponsor to clearly define what business need the project addresses. Review the business purpose of the project not only at the beginning of the project, but also at the start of each phase.

In our example, the executive sponsor is the CFO, as is typical in many implementations.

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Other senior executives like the CIO or a high-level VP could also be the executive sponsor. BI projects often fail if they lack sufficient executive sponsorship.

The project charter (see appendix for a sample project charter template) will formally authorize a new project or continue an existing project into the next phase. A project charter typically includes the high level objectives, key stakeholders, high level description of deliverables, benefits, and critical success factors. This document will be the foundation for planning.

The high level objectives for our hypothetical project include:

- Exposing comprehensive customer information to internal analysts and bankers at 100 branches of the bank
- Determining and exposing any available information that could be used to identify cross-sell and up-sell opportunities
- Building of an extensible BI system to be the foundation of not only the current requirements, but also to be capable of supporting future needs for 5-10 years

Stakeholders will exist at every level in the organization. For our project, the stakeholders include the CFO and supporting analysts, the marketing group, the IT department, and the bankers in the field branches. Managing different and sometimes competing stakeholder agendas is a major task in a BI project. Successful BI projects engage the stakeholders at every step of the project. If you wait until the end of the project to engage the stakeholders, expect some surprised and potentially upset or disappointed stakeholders.

Determine how you are going to communicate the value of your project to executives to get continuous support and sponsorship. Executives are going to want to know how much value the project is going to add to the organization in order to determine approval and funding. Take the time to articulate the benefits of the project. Sometimes it is hard to determine and communicate the monetary value of a BI project. The following should be considered when determining the value and ultimately the Return on Investment (ROI) of a BI project:

- **Increased Income:** better customer retention, better sales management, etc.
- **Decreased cost:** better utilization of analyst time, shutting down legacy systems, identifying less expensive vendors, etc.
- **Decreased Risk:** accurate regulatory reporting, fraud detection, quicker identification of problems, etc.

START WITH A FIRM FOUNDATION

The Project Management Plan is crucial to your project since it is the basis on which the project will be measured.

Planning the BI Project

A project management plan includes all of the planning, coordinating, and negotiating necessary to document all of the detailed information about the project. This is the document, or collection of documents, that will become known as a project management plan, and includes details around scope, time, cost, quality, human resources, communications, risks, and procurement.

The project management plan is crucial to your project since it is the basis on which the project will be measured. It can be used to aid in communication between stakeholders and to define the content and timing of project reviews. Here are some elements that make up a plan:

- Project charter (Completed in the Initiation Phase)
- Scope statement
- Work breakdown structure (WBS)
- Cost estimates, schedule, responsibilities for each deliverable
- Milestones with target dates
- Risk / issues register
- Management plans (scope, schedule, cost, quality, communications, risk, and procurement)

In the initiation phase, you created an initial draft of a project charter. In the planning phase, the project charter will be updated and will contain the project statement of work (SOW) which

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describes the product or service the project was undertaken to complete, including:

- Business need
- Product scope description (enough to support planning)
- Strategic plan (how does this project support the organization's vision?)

In this process group, the project scope statement needs to be further defined to be as specific as possible. It is important to document the project objectives, deliverables, and requirements so that they can be used as a basis for future project decisions.

Once the scope is further defined, it is important to document how the scope will be managed in the scope management plan. Should the customer want to add deliverables, a change request should be written and submitted to the executive sponsor for approval. See the Appendix for a sample change request template.

The work breakdown structure (WBS) is focused on breaking down the overall deliverables for the project into tasks that can be scheduled and estimated. The project manager can leverage the WBS to create a more granular level document to track tasks, resources, durations, and dependencies. Dependencies are important so that you can maximize resources to meet the deliverable dates.

For our Data Mart project, the tasks associated to the deliverables are:

- Conduct workshops to drive requirements with the business analysts
- Document standard report & ad-hoc functional requirements
- Create logical /physical data model
- Write an ETL design document covering the two sources
- Develop project plan

Based on the above tasks, dependencies that could be identified are:

- The data model cannot start until the report & ad-hoc requirements are defined
- The ETL design document cannot start until the physical model is complete
- The data model cannot be complete until the ER software has been procured

THE DATA MODEL IS KEY

Keep in mind that the most important component of a BI project is the data model.

Executing the BI Project

During the execution phase, the team will be implementing the project and you will be managing the plan. You will need to direct and manage your resources to meet the project objectives.

At this point, you need to acquire and develop your project team. For our Data Mart project, we have identified the following personnel resources:

- Business Analyst (*Internal Resource*)
- Data Modeler (*External Resource*)
- Technical Analyst (*External Resource*)

It is the project manager's responsibility to identify the appropriate personnel, document the skills or knowledge needed, and negotiate with functional managers or other project managers for the desired resources. Keep in mind that the most important component of a BI project is the data model, so make sure the person or group handling it is experienced and competent.

You will want to consider team development to get your staff working together well. Techniques include team building activities, co-location, and reward / recognition systems.

It is important that the project manager keeps the team focused on tasks as defined in the planning phase. For our Data Mart project, focus on managing the following:

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- Requirements: Did the business analyst clearly communicate the expectations for standard reports and ad hoc analysis?
- Data model: Make sure it will support the 15 standard reports and that it will meet ad hoc analysis requirements
- Data Integration: There are only two data sources in scope for this phase, make sure 'new' data sources are not introduced in this phase
- Reporting: Ensure the functional requirements being developed here meet the requirements and any gaps in requirements are addressed appropriately

Quality assurance is the process done to ensure that the project meets the quality of standards outlined during the planning process. The measurements taken during quality control are analyzed to determine if the processes followed are within the acceptable range of tolerance, or if adjustments need to be made.

In the Execution Phase, approved changes need to be implemented. In the Planning Phase you should have defined how you were going to manage changes. Now you need to implement approved changes and take corrective actions.

We created a Communication Plan in the Planning Phase. Stick to the plan throughout the project. Effective communication is crucially important during project execution. Communication should focus on project progress, risk mitigation, and issue resolution. Extra effort needs to be applied to make sure all relevant staff (including the executive sponsor) understands the significance of project issues. A difficult task in most BI projects is communicating technical issues (or the implication of technical issues) to staff that are not technologists.

COMMUNICATE CLEARLY

Communication is the most critical component of a project manager's role.

Managing & Controlling

At this point in the project, you should be monitoring the performance of the team, providing feedback to team members as needed, issue resolution, and produce effective communication to all stakeholders.

Looking at our Data Mart project, you should be measuring the performance of how the business analysts are doing with the requirements. Are they on schedule? Will they produce their deliverables according to what has been defined in the project management plan? If not, what is the variance – are they one day behind or ahead of schedule?

Providing constructive feedback to team members is important to getting them to execute their tasks and deliver according to the project plan while maintaining quality. The project manager should meet with each team member as needed and give them feedback on tasks they've done well, while understanding the challenges they are facing.

Furthermore, it is likely at this point in the project that project deliverables are being reviewed and signed off by the stakeholders. It is most certain that they will raise quality as an issue and the project manager will need to communicate how quality was measured in the execution phase. Also, be prepared to discuss differences in expectations between the stakeholders and the team members. Often, a stakeholder will assume numerous requirements were part of the project, when in fact, the scope dictated otherwise.

Communication is the most critical component of a project manager's role. In this process group, all stakeholders need to be part of some regularly scheduled status meeting so that no one is surprised should a variance occur.

Most projects, including BI projects, will use the following communication channels:

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- Status meetings for team leads: discuss dependencies, tasks, issues.
- Status meetings for key stakeholders: review milestones, dates, next steps
- Status reports: what has your team accomplished this week, next week, any issues?

A ubiquitous way to report project status is to show your project (or aspects of your project) as red, yellow, or green. Green represents that the project is delivering on time and within budget. Yellow means that the project has a couple of issues that need to get resolved before the project gets off track. Red means that the project has gone astray and dates, deliverables are in jeopardy.

It is inevitable that new requirements will be identified throughout your project. It is now time to manage to your plan.

For our Data Mart project, you have been told in a meeting that an additional data source needs to be analyzed and may need to be included as an ETL source. How do you respond? The project manager should communicate the tasks and estimate the time and cost it would take for the business analyst to complete this request. If the sponsor approves the change, a change request will be completed.

You will likely be in several meetings where numerous requests are asked of the project team. Keep a log of these requests and hold a weekly meeting to review these and new ones that come up. And remember that approved changes will require you to make updates to your project plan.

Closure

Often, putting closure to a project is overlooked but it is important to provide a formal, orderly end to the project.

In our example, let's assume that we completed all the deliverables: the functional requirements for the standard reports and ad hoc functionality are fully documented. The logical and physical data models map to the requirements. The stakeholders have reviewed each of the deliverables defined in the project plan and have provided their approval.

There is a little more to closing out the project than just scheduling a post-project celebratory outing.

All of the deliverables should be put in a location where they can be referenced in the future. The project manager should document any lessons learned from this project and share with all of the stakeholders.

The team can be released and focused on the next priority. More than likely, part of the team will return for the next phase of the project. If external vendors are no longer needed, their contracts will need to be closed out.

If you haven't already done so, it is now time to sit down with the sponsor to plan the next project / phase!

Conclusion

Business Intelligence projects are a big investment for organizations and when managed appropriately can provide big returns. Understanding business intelligence concepts and how to apply them within the five PMI process groups will help you manage these projects successfully.