

The Project Management Warehouse: *Information Integration for a Purpose*

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ABSTRACT

This paper will discuss the issues, concerns and challenges facing Project Managers due to non-integrated project management data, and how using a Project Management Data Warehouse can facilitate a more efficient program and provide a better quality product.

Project Management process improvements require collecting data from many departments within an organization, such as, Production, Engineering, Finance, Inventory Management, Quality and Purchasing.

Typically, these functional groups collect large amounts of data from disparate and disconnected systems. The disparity and disconnection of these systems inhibits the visibility of the project manager and causes him/her to operate in a reactionary mode vs. a proactive, error preventative mode. Transaction systems gather and store functional data; however, to serve the decision-making requirements of the enterprise, a Project Management Warehouse is required.

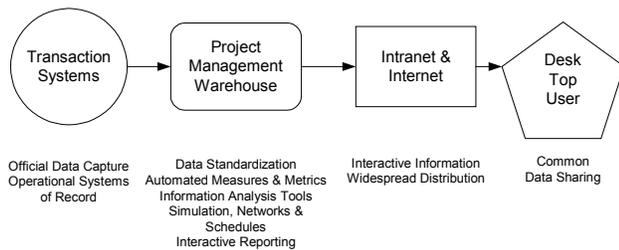


Figure 1: Typical System Information Flow

The Project Management Warehouse can collect and manage the data from the disparate sources, standardize the data fields and become the single source for project management data. The Warehouse needs to be designed to sort, measure, integrate and output the captured data for use in project management analysis and to automate measures and metrics. This information can then be distributed to the entire organization electronically via the web. Updates to the final products (charts and graphs) are accomplished by updating the transaction systems. This allows information ownership (data integrity) to remain with the functional department.

INTRODUCTION

The approach taken for this discussion will first focus on the Business Issues that face managing large and complex projects. It will then discuss the various characteristics of Project Management, how an integrated data repository can facilitate this activity and the evaluation criteria to determine a project's relative success. Once we have a clear understanding of the Business Challenge, we will look at the information resources available from which effective decision-making can be enabled. Finally we will focus on the Project Management Warehouse itself; what it is, how to build and deploy it most effectively.

BUSINESS PROBLEMS

PROJECT MANAGEMENT

Understanding project management begins with defining a project. A project involves a single, definable purpose, end product or result. A project can be considered to be any series of activities and tasks that:

- Have a specific objective to be completed within certain specifications
- Have defined start and end dates
- Have funding limits
- Consume Resources (money, people and/or equipment)

PROJECT MANAGEMENT CHARACTERISTICS:

PROJECT PLANNING

- Definition of work requirements (task relationship, task sequence)
- Definition of resources needed
- Integration of work requirements and resources

PROJECT MONITORING

- Tracking progress
- Comparing actual to predicted
- Analyzing impact
- Making adjustments

PROJECT MANAGEMENT SUCCESS CRITERIA

Successful project management can then be defined as having achieved the project objectives:

- Delivering the desired product at the desired performance/technology level
- Within time
- Within cost
- While utilizing the assigned resources effectively and efficiently

Finally, a project is the process of working to achieve a goal. During the process, projects pass through several distinct phases called the *project life cycle*. The tasks, people, organizations and other resources change as the project moves from one phase to the next.

INFORMATION INTEGRATION

Today's Project Manager is responsible for coordinating and integrating activities across multiple functional lines. He/She has to make immediate decisions based on the data available at the time the decision must be made. If he/she get incomplete information from one function, and old conflicting information from yet another, the decision may reflect the confused input. The requirement is to work from timely, integrated and accurate data. Discipline needs to be instilled to maintain the transaction systems so that the same data that is used to run the daily operations (transaction data) is the same data that can be used for simulation modeling.

TRANSACTION VS. ANALYSIS (OLTP VS. OLAP)

On Line Transaction Processing (OLTP) are systems of record for the function departments. They are those systems which collect data required to perform their daily tasks, such as MRP data, financial actuals, engineering schedule information, quality non-conformance data, etc..

On Line Analytical Processing (OLAP) systems extract the data from the OLTP systems for use in analysis, communication and presentation. 'What If' project management analysis and data correlation can then be performed using actual transaction data (including sequential/relational data) without affecting the transaction system. Attempting to utilize an OLTP system to perform OLAP tasks can be difficult and sometimes impossible.

TREND ANALYSIS AND STATISTICAL CORRELATION

Once the data is collected, standardized and ready for analysis, the Project Manager can begin to correlate data (data collection may have to be disciplined or augmented by tables since different functions may have different naming schemes for common data). The Project Manager can have immediate visibility to inventory levels, bills of materials, automate health measures of functional performance, visibility to de-conflict capacity issues months in advance, compare your spend plan to your build plan, schedule deviations to non-conformance activity, etc. Learning to recognize data trends may then be used to predict, and therefore, mitigate (or prevent) issues before they occur.

ENTERPRISE RESOURCE PLANNING (ERP) SYSTEMS

Most ERP systems promise improved integration of the disparate functional data. This enhanced integration can greatly improve the data sharing issues needed for enterprise level data analysis, but they are not the total answer. The current ERP systems are very good at integrating business transactions; they are not designed to provide the information analysis needed for project management. Major complaints of the ERP systems today are:

- millions of dollars of implementation costs
- the inability to get the information out of a behemoth system
- lack of analysis tools

Relying on ERP systems, alone, for project management information could mean more transition time, data integration problems, and ultimately not getting the bottom line results you need from analyzing the data.

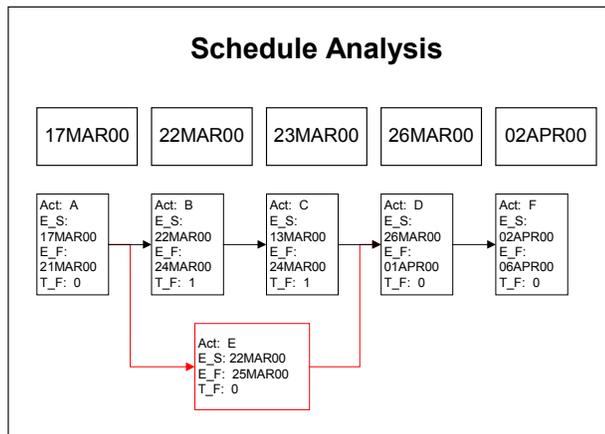


Figure 2: Typical Task Flow

PROJECT MANAGEMENT WAREHOUSE

WHAT INFORMATION IS DELIVERED AND HOW IS IT DELIVERED

Just collecting data does not answer the mail. Without proper access to project information and analysis, the Project Manager usually ends up depending on gut feel for his/her decision making process. This type of decision making can reduce the ability to achieve a competitive advantage to pure luck.

The Project Management Warehouse provides one stop (information) shopping. By enabling access to project management information on the web, concurrent communication may be attained by internal and external customers from a single data source. Web access can be designed to include:

- Interactive access to clean data files that can be accessed for analysis or ad-hoc reporting.
- Integrated charts, graphs and reports, updated automatically when the transaction data is refreshed.
- Interactive charts and graphs, designed real time, utilizing drop down box or other advanced GUI techniques.

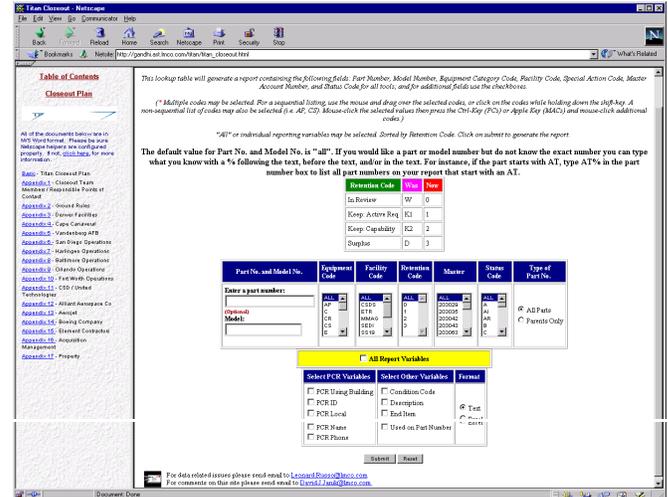


Figure 3: Interactive Data Access Screen

BUILDING THE PROJECT MANAGEMENT WAREHOUSE

For most companies, the initial steps for building a Project Management Warehouse are already in place. Data collection is automated and routinely recorded (OLTP). The project management Warehouse does not replace the enterprise data warehouse. The project management Warehouse should be incorporated within the enterprise warehouse. The enterprise warehouse feeds the project management Warehouse by flat file exchange, FTP, direct access, etc.

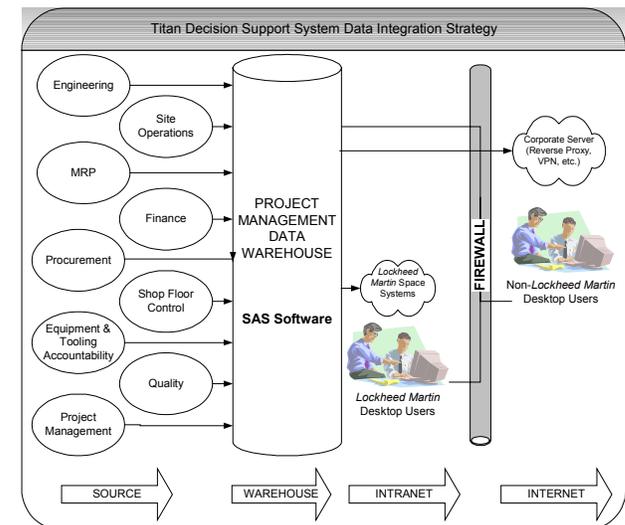


Figure 4: Decision Support Data Flow

SOFTWARE

Many software packages are available today to provide project management capability; however, few provide the ability to interface with multiple transaction systems housed on multiple platforms. Our exhaustive trade study led us to utilize SAS software. It provides the software required to create the project management Warehouse, provide project management analysis and simulation (operations research capability), statistical analysis, interactive graphics (including Java based graphic drill down capability), plus web and database management.

CONCLUSION

Knowledge management starts with an understanding of processes and development of measurements that identify the effectiveness and applicability of those processes. J.M. Clark, an economics professor at Columbia University, said, "Knowledge is the only instrument of production that is not subject to diminishing returns." Knowledge Management is often defined as the ability to get the right information to the right people at the right time. Understanding the inter-relationships of project functions and integrated impacts caused by change may directly effect the decision a manager makes (and when he/she make it). Some managers use information technology, others make use of information technology. Those that make use of their information technology are those who hold a distinctive competitive advantage.

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