



Project Software Solution Guide

I. Introduction

The Purpose of This Guide

Project software is a tool that is used by many companies to schedule resources, estimate costs, track status and analyze results of their projects. The purpose of this guide is to be a resource for those interested in learning more about the capabilities and technology of mid-market project software and how you can take advantage of these capabilities for your project-based business. This guide will not provide a comprehensive list of all the functionality possible in project software but will focus on some of the key functionality and capabilities of project software systems that are likely to be of the greatest benefit to you.

Project Software Industries

Project software is used to track projects in many industries. The following are a few examples of the industries for which project software is most prevalent and some of the key functionality required by that industry:

- **Architecture & Engineering.** Strong document controls are needed for this industry as change orders and revisions to projects need to be tracked. Workflow capabilities for approvals and inspection management are also very important for the Architecture and Engineering industry.
- **Accounting & Legal.** Accounting and law firms are very project driven and require very tight timekeeping capabilities. Software focused on this industry offers time clock integration, closed loop billing, document management, client management tools, etc.
- **Construction.** Construction companies require specific American Institute of Architects (AIA) billing, retainage management, permit management, long-term construction contracts and subcontract management. Other key functionality includes equipment cost and maintenance, crew management, tool tracking, progress billing, multi-year and multi-phase project tracking, and equipment scheduling.
- **Government Projects.** Government projects require unique tracking and billing functionality. Fund accounting, encumbrances, government specialized reporting, travel management, expense management documentation and audit controls are key functionality required by this industry.
- **Manufacturing.** Many manufacturing companies have job cost tracking requirements. Bills of materials, distribution, MRP, materials planning, research & development tracking, prototypes and change orders are key functionality required by manufacturing companies.

- **Software and Information Technology.** Software development companies have very heavy project accounting requirements as they have research & development tracking requirements and significant revenue recognition requirements. They also must track maintenance contracts and service calls.
- **Professional Services.** Project software that focuses on professional services companies offer service agreement management, contract renewals, dispatch, scheduling, resource planning, materials management, warranty tracking, revenue recognition, version control management, time and expense, work orders, preventative maintenance and other functions.

Project Software History

In the 1970's and 80's, most accounting software systems offered project accounting functionality through the general ledger. Each project was assigned a general ledger account number, and all costs attributed to a project were placed in that account. This enabled tracking the costs of labor, expenses and materials for a project. It also required long account codes to track all of the projects that a company managed. Because early accounting software had a limited number of digits in the account codes, this restricted the number of projects that could be tracked in this manner.

Software companies began to realize that there was more to project accounting than just entering general ledger account code information since this method only captured the historical cost of a project. So, they began to develop project management software, which was designed to be a proactive tool for planning and managing the resources of a project. At the same time, other software companies saw the project accounting market as an opportunity to offer software specifically geared to companies with heavy project accounting needs. The aerospace and construction industries were especially interested in this functionality and specialty software was developed to serve those markets.

As we moved into the early 1990's, accounting software vendors began offering nearly unlimited digits in the account code of the general ledger. This eased the restriction on the number of projects that could be tracked in the general ledger, but still required maintenance of long account numbers. Meanwhile, the project accounting and project management software vendors continued to develop their products and were gaining market share.

In the late 1990's the number of project software tools available on the market exploded as companies began purchasing project specific software. The expansion of the services industry in the United States and the dot-com boom fueled this growth. Product development brought enhancements to the capabilities of these systems and the gaps in functionality between the vendors closed as they acquired products to expand their functional offerings. At the same time, Enterprise Resource Planning (ERP) software vendors began focusing on adding project accounting and project management functionality to their suite of products.

In the early 2000's, project software vendors began to put together a complete project software solution to manage the entire life cycle of a project from lead management, resource allocation, project tracking, project accounting, project billing and reporting. This suite of integrated software tools is known as Professional Services Automation (PSA) and is focused on meeting the needs of the professional services industry. The concept of PSA came about as both project accounting and project management software vendors realized that what a project manager really needed was a combination of both tool sets.

PSA software allows professional service organization to have an integrated suite of products for better management of resources and billing requirements. There is a lot of momentum for the development and implementation of PSA software in the market right now.

II. Project Software Market Overview

The following topics provide a high level understanding of the project software market and will help you focus on things to look for as you evaluate project software.

- Project Management Software
- The Four Levels of Project Accounting Software
- Technology
- Reporting
- Value Added Reseller (VAR)/Implementation Partner

Project Management Software

Project management software enables the planning and management of a project including project planning, resource allocation, budgeting, scheduling, skills management, document sharing, light project accounting and other project management tools. Originally created to produce Gantt and PERT charts, they have expanded their functionality into very comprehensive and, sometimes, complicated project management tools that manage the resources of very large multi-national organizations. Although there are many project management tools available, the product that has become widely adopted in the mid-market is Microsoft Project. In fact, most of the leading Enterprise Resource Planning (ERP) vendors have developed links to Microsoft Project.

The Four Levels of Project Accounting Software

While project management software is focused on planning and resource allocation to a project, project accounting software is focused on tracking the costs and results of the project. When considering project accounting software, it is important to first understand the level of project accounting functionality that is necessary for your company. Some companies only need to track the cost of a project, while others have sophisticated project accounting requirements that require detailed tracking of both financial and non-financial data.

Project accounting can be divided into four general levels of functionality. Each level includes all of the functionality of the previous level as well as additional capabilities. However, each level also adds a layer of cost and complexity. By focusing on the right level of functionality for your situation, you will have a system geared to the way you account for projects that will also fit within your budget and technical capabilities.

Level 1 - General Ledger Account Code

This is the first level of project accounting functionality. The general ledger is used to collect project cost by utilizing a segment in the account code to segregate and report on costs attributed to a project. This method works well when you need to track the cost/revenue history of a project without a lot of detail and there are not a lot of complex projects in a year. It is very easy to maintain, and many companies use this method to track capital projects. The drawback is that reporting options are limited because there is no information collected on the non-financial data of a project and projects cannot be broken down into tasks and subtasks.

Level 2 - Job Cost

The second level is called job cost. Job cost modules allow the tracking of both financial and non-financial data, as well as personnel and hours worked on a project. It has more detailed budgeting functionality

that includes comparisons of non-financial data. Materials used in a project can be tracked and allocated over multiple projects. Job cost reports provide a detailed breakdown of a project, but it still has very limited revenue recognition, workflow management, resource scheduling and project realization data. The most widespread use of the job cost method is in manufacturing environments, but some smaller construction, engineering, and services organizations that do not have complex project requirements also use it. Job cost offers more project details than the General Ledger account code method can provide, but is not as robust in functionality as project accounting or professional services automation.

Level 3 - Project Accounting

Project accounting modules offer enhanced project tools, including the ability to shift from a historical view of a project to proactive management. Data can be entered and gathered by many different modules such as timekeeping, payroll, purchasing and fulfillment. Other tools available to project managers include deep project hierarchies, project budgeting, encumbered costs, contract management and materials management. In addition, revenue recognition, billing and labor management details are handled by the system. This tool enables management of projects from a budget through detailed project data where many people are working on the same project and being held accountable for the areas in which they operate. The tracking of this information requires more discipline than job cost, as it requires more data input and maintenance, but the visibility of what is actually happening on a project is much greater. The drawback is that resources and scheduled tasks provided by project management software are still disconnected from the project accounting.

Level 4 – Professional Services Automation

PSA software is the most sophisticated level of project accounting. It offers project accounting software with additional management tools either built in to the application or very tightly integrated. These tools track the entire lifecycle of a project and include the following functionality: Financial Accounting, Customer Relationship Management, Project Management and Resource Scheduling, Document Management, Time and Billing, etc. This software works best in professional service organizations where deep functionality and tight integration of all the functionality of project software is required. Although this requires significant discipline to maintain all of the data elements that are required, the power of PSA is that it makes the difficult connection between the when, the who, the how, the what, and the cost of a project all in one application. This provides executives and project managers a complete view of what is going on in a project and multiple projects, and the tools to manage these projects.

Technology

Recent advances in technology have enhanced the capabilities of project management and project accounting software. The following are a few of the technological advances of project software products.

Integration to Financial Software

Whereas many project software systems were originally developed as stand-alone modules, project software has become much more tightly integrated to financial software. This enables data to be seamlessly passed between the project and financial modules. This integration eliminates the need for double entry of project information and/or costly custom integration between modules.

Integration to MS Project & MS Outlook

Mid-market project software has developed standard integration links to Microsoft Project and Microsoft Outlook. The main advantage of this integration is that users already use these tools on a daily basis and are familiar with their capabilities. MS Project provides project management functionality such as scheduling projects, managing resources, Gantt and PERT chart setup and other project tracking tools.

MS Outlook integration links project software with calendars, manages emails, and has increased team collaboration through automatic generation of emails, meeting scheduling, and other tools.

Electronic Timesheets

One of the most widely used technological advancements is electronic timesheet functionality. It provides remote timesheet and expense entry via the Internet. Now, anyone entering a timesheet can do so on a real time basis via a secure Internet connection from anywhere in the world. A further development of this functionality is Wireless Access Protocol (WAP) capability. This allows access to the system through any wireless device, including Personal Data Assistants (PDA), cell phones, etc. This is especially useful for service personnel in remote locations as they can enter time and project status via a wireless device, allowing project managers to have a "real time" view of a project.

Internet Portals

Internet portals are special web screens that are tailored to a user's specific system access needs. A user screen will be set up to include only the information that the user needs to do their job. Other information not pertinent to their work is eliminated from the screen. This increases security of the system and allows the user to focus on the work specific to them. This capability also extends to users of the system that are outside the company. Customers and suppliers can be set up to have secure Internet access to the system for tracking the status of a project, submitting invoices, monitoring payments, etc. This enables customers and suppliers to function in a "self service" environment, without the need to pick up a phone and call project, or accounting personnel.

Reporting

There are many options available for reporting project information. Project software offers great project specific reporting capabilities out of the box. For companies with sophisticated requirements, there are also best-of-breed reporting tools provided by products such as FRx, Crystal, Cognos, Brio, Business Objects, and others. Import/export capabilities to tools such as Microsoft Access and Microsoft Excel are also widely used. Many system users are already familiar with these programs and prefer to use them as their reporting tool of choice.

The following are a couple of the analysis tools that can be used if your requirements are more sophisticated:

- On-Line Analytical Processing (OLAP)-Information is exported from the transactional software and put into data cubes. These cubes are then accessed and data can be viewed from many different angles allowing for some very interesting ways of looking at project information.
- Data Marts/Data Warehouse—These tools are typically used to store large amounts of data. Information is exported to a data warehouse where complex queries can be conducted without bogging down the transactional software.

Value Added Reseller/Implementation Partner

The Value Added Reseller (VAR) will work with you in software installation and set up, data conversion, best practices identification, and ongoing support. There are usually many VARs in a geographic location that will take you through the sales process, demo the product, implement the software and provide maintenance and support.

VAR selection should be done early in the software selection process, as it can be difficult to switch to a different VAR after you have traveled down the sales path. In selecting the right VAR you will want to understand their experience/expertise in the following areas:

- Product – How long has the VAR been qualified on this product and how many installations have been completed? What other products does the VAR offer? How many employees are dedicated to the product you are interested in?
- Project Modules – Does the VAR have experience with the project modules you will be implementing?
- Technology – Does the VAR have experience on the technology that you will implement?
- Industry – Does the VAR have experience in your industry, or will you be training the VAR to implement for your situation?
- Regional Presence – How many employees does the VAR have? What is the geographical area that they normally cover?

Find a VAR with experience in your industry that has a focus on the project software, with many similar implementations. The importance of finding the right VAR for your situation cannot be understated, as their capabilities and personnel could be the difference between success and failure in your implementation.

III. Project Software Functional Overview

Project software was originally developed to focus on a particular area of projects such as ERP, project management or project accounting. As project software has evolved, functionality has been developed that crosses the lines of these traditional categories. For example project management software has added project accounting functionality to the product. The following chart demonstrates this overlap for just a few of the functions available in project software.

Function	Project Accounting	Project Management
Project Timeline (Gantt/PERT)		Strong
Resources Scheduling & Allocation		Strong
Budget Management	Strong	Some
Project Reporting	Strong	Some
Billing & Invoicing	Strong	Some
Subcontract Management	Strong	
Document Management		Some

The following lists some of the major functionality available in project software. Although it is not comprehensive, it will give you a high-level overview of the capabilities of project software and how this functionality can be used in your business.

- 1. Contact Management.** This is the ability to track contacts for both leads and customers. Some of this functionality is handled through Customer Relationship Management (CRM). This is more than just tracking the name, number and address of a contact, it also includes contact history information, payment status, customer service issues, etc. This places all of the information of a contact in one place that can be used by salespeople, customer account representatives, project managers, etc.
- 2. Lead Tracking.** Tracking leads is a key component of the sales process for most organizations. This functionality enables the tracking of a lead through the proposal process including literature management offering brochure and specification sheet tracking.

- 3. Proposal Management.** There are two major components of proposal management. The first is the creation of a proposal and the second is the management of that proposal. Proposal creation can be quite complicated, as there are many industry specific requirements for this process. For example, construction focused software allows you to run a measuring wheel over drawings and calculations are made on the measured item for both labor and materials. This information then becomes a line item in the proposal. Also, project software offers the ability to create proposals based on estimated costs, or the actual cost of past contracts. Proposal management tracks a proposal through the journey to become a contract. Iteration tracking tracks changes that automatically roll proposal data into the final contract and project budget. This eliminates re-keying of data and makes the proposal process much more efficient.
- 4. Contract Management.** Contract management is the ability to manage a contract through the life of a project or multiple projects. Special pricing and billing agreements may be negotiated and the software may need to manage these billing agreements throughout the project. Integration to billing is an advantage in this situation. Contract addendums and modifications are also tracked and variance alerts can be set up. Warranty contracts also can be maintained and tracked by customer and product, including reason codes and Return Materials Authorizations (RMA). This functionality is very important to companies with many long-term contracts since each client may have unique terms, making it very difficult to track and maintain.
- 5. Renewal Management.** Contract and maintenance services that may be renewed can be tracked with this aspect of project software. Alerts can be automatically sent by e-mail or other forms of notification when a renewal date is approaching. Contract history can also be tracked for easy development of a new contract. This is an often forgotten part of the sales process, but it is very important for maintaining customers. Studies have shown that the cost of selling to a new customer is much higher than the cost to maintain and renew a current customer.
- 6. Subcontractor Management.** Many project-based companies work with subcontractors. Subcontractor management allows the ability to track the "sub's" work, including multiple jobs for a subcontractor and multiple subcontractors for a job. Payment terms include retainage, hourly, contract, time & materials, cost plus, cost-not-to-exceed and others. The construction industry has heavy requirements in this area.
- 7. Order Entry.** Not all services are entered or maintained as a contract, so project management software has sales order entry functionality. It is interesting to note that mid-market project accounting software is also fairly strong in distribution functionality that includes materials management, services, or a combination of both.
- 8. Project Budgeting.** Project budgeting offers the ability to set up a budget with fixed and variable costs. This functionality allows the budget to be created at the project level with all of its related expenses, materials and expected revenues. This is more detailed than budgeting in the general ledger. Budgeting functionality may include creating "what-if" scenarios and baseline budgets. Another key component to project budgeting is the ability to track multiple budgets and changes to a budget for a project.
- 9. Project Planning.** Project planning offers the ability to set up a project, create a timeline, and set up the processes and key documentation for a project. It is at the heart of project management software. This capability offers templates and tools to generate new project plans, including a methodology manager to set up best practice methodologies that all projects automatically adhere to. It includes the ability to create Gantt and Pert charts for scheduling of resources and tracking throughout the life of the project. It also includes calendars, task linking, task sheets, project versions, critical paths, and tracking of bottlenecks in the process. It provides sophisticated tools for "what-if" scenarios on multiple projects, including resource allocation, project timing, funding,

availability, etc. This enables the project manager to put all of the pieces of a project together before it starts.

A preliminary schedule is created in one of three ways. The first option is to enter information into a tool where each task or subtask is identified along with the duration and dependencies. The second option is to enter the tasks and subtasks into a Gantt Chart, and, then, drag a duration bar over the calendar days or weeks indicating the duration of the task. Dependencies are established by dragging tasks together. The third method is through a PERT chart where boxes represent activities in which dependencies are also created by dragging an arrow from one chart to another.

10. Resource Scheduling & Allocation. After the setup of the initial plan, resources must be allocated to the project. This includes the allocation of personnel, assets, inventory, etc. to a project. It includes skills tracking, resource forecasting, availability of employees, employee utilization and project realization.

Resource pooling can be done to make sure the project can be realistically completed with personnel that have the appropriate skill set.

Resource leveling can be used to stretch out the time where a resource with a finite capacity cannot complete the task according to the original plan. Personnel or teams can be assigned to tasks or categories across multiple projects, and the model can identify over and under commitments, as well as utilization. It also tracks when key materials must be ordered to be available for the right moment in the project. Resource scheduling and allocation ensure that resource constraints can be properly reserved and planned for during the life of a project.

11. Work Breakdown Structure. This is the ability to have a multiple level hierarchy for a project and is set up in the initial planning process. The project is broken down to sub-categories (i.e. Project, Phase, Category, Activity, and Task). Costs and revenues can be accumulated at each of these levels and profitability analysis made on the cost for that level. Useful profitability analysis at the sub-project level is important to understanding the efficiency of activities and requires good data integration between resource management, project/task scheduling and project accounting (i.e. time collection, expense management, revenue recognition, allocations, etc.) functions.

12. Project Types. Project software has the ability to handle multiple types of projects. Examples of these project types include: time and materials, fixed price, cost reimbursement, unit cost, cost plus, cost-not-to-exceed, and other types of projects. This functionality is very useful for companies that have dynamic project environments where multiple types of projects are set up.

13. Change Order Management. Change orders have a significant impact on a project that goes beyond just a simple change to the schedule. A change order affects the budget, scheduling of resources, billing, percentage of completion, materials management requirements, and other aspects of a project. Project software offers the ability to retain history of a change order and track the effects of the change on the project, rather than just maintaining the current status of the project. This historical information can be very useful for final project analysis, client management, and future planning of similar projects and clients.

14. Project Collaboration. One of the greatest advantages that modern technology has brought project software is enhanced project collaboration capability. Internet functionality allows the ability to bring together a project team, even if they are not physically located in the same building or even the same city. Web-enabled project software allows project updates to be posted to a secure web site where all members of the team can have access to the latest information on the project. This capability has increased productivity because tools, documents, and resources can be shared quickly and efficiently.

Collaboration tools also include email to notify team members of new developments, deliver documents and maintain communications. Calendar software is used to schedule meetings and events, and alerts can be sent to team members via wireless devices, such as PDAs, as reminders and to notify them of any changes to meetings or to the project. Workflow capabilities, such as online routing of documents and approvals, have also been a great advantage.

15. Time Collection. This is a key function of project-based companies and another area where technology has provided tremendous advantages for project software. Many vendors are offering electronic timesheets that can be entered over the Internet via a web browser. This enables time to be entered no matter where the employee is located. Secure online routing of timesheets and approvals have made the process of approving timesheets a real-time activity. This also allows updates to the overall project to happen quickly. Some vendors offer timekeeping functionality that will clock in/clock out employees online. Some vendors also offer WAP enabled time entry via cell phones and PDAs. Time is a limited resource in a project, so the ability to instantly capture accurate project labor information is critical for a project manager

16. Billing Rate Management. Some project-based companies have requirements for multiple billing rates for each employee depending on the job function that employee is performing. Other requirements may be special contract billing rates for a particular project or geographic location. Project software that maintains this information makes the billing process more efficient.

17. Expense Management. Project software has the ability for online expense forms. These expenses can be approved online and linked to accounts payable or a third party payment provider for reimbursement. Travel management capabilities include premium and expense tracking, travel advances, cash receipts, and multi-currency functionality. This streamlined expense reimbursement process reduces the cost of managing employee expenses, while at the same time providing much faster reimbursements to employees.

18. Financial Accounting. Financial accounting software that is tightly integrated with project software offers several advantages. First, this integration eliminates the need for re-keying of project data into the financial system or developing costly custom integration. It also allows access to the project identifiers and deeper tracking of project data. For example, within a project there may be several phases, activities, and tasks that project focused financial software will track at all levels. Strong project integration with financial software gives accounts receivable personnel the ability to view the status of a customer's project. They then have a better understanding of the reason for the late payment of an invoice. The same issue works in the other direction because a project manager can see accounts receivable information to better manage a client that may be a slow payer. Fixed asset tracking also provides the ability to track equipment such as laptops, cell phones, and other specialized tools to an employee.

19. Revenue Recognition. The billing cycle may or may not match the recognition of revenue for a project, which necessitates revenue recognition tracking functionality. Project accounting software offers the ability to track multiple revenue recognition options for each contract. This includes the ability to track down payments, retainers and progress payments while spreading the recognition of that revenue over the life of the project.

20. Document Management. Document management is the ability to track required documents for projects. For example, government contractors and aerospace companies have certain documentation requirements that must be maintained throughout a project. These documents include permits, inspections, certified drawings, certifications, (UL labeling, FTC requirements, etc.) and other documents. The ability to handle documents and audit trails is very important for billing requirements and audits that occur in this industry. Document management functionality not only

handles the industry requirements, but also streamlines the billing process because the required documentation is maintained on a continual basis.

- 21. Allocations.** Allocation of overhead and other indirect costs to a project or multiple projects is a very important function for project software. This includes the ability to create allocation formulas that can be applied to any cost or revenue. These allocations enable more accurate project profitability analyses.
- 22. Encumbrances.** There are two types of project encumbrances: hard and soft. Hard encumbrances are funds that cannot be used for any other purpose. Government projects frequently are classified as hard encumbrances. Soft encumbrances are funds that are earmarked for a particular situation, but allow the use of the funds for other purposes. This capability offers flexibility to adapt to the requirements of your situation.
- 23. Materials Management.** Materials management includes such things as forecasting, procurement, receiving, product assembly, inventory control, warehouse management, fulfillment, shipping, and logistics. Some project software has light Materials Resource Planning (MRP) manufacturing software, including kitting and product routing. This functionality is especially useful for distribution companies with project requirements, and service and repair vendors that need to track repair and replacement parts, as well as service orders for installation and repair.
- 24. Billing.** Timely billing is very important for the success of project-based companies. Project software offers flexible billing capability including the ability to bill and track down payments, retainage, progress payments against the contract, percentage of completion by deliverable, milestones, time and materials with fixed hourly rates, cost plus, contracted pricing, and price per unit. Most project software vendors also offer flexible invoice formats that allow adjustment of the invoice for client or customer specific requirements. For professional services organizations, billing can be linked directly to time collection for automatic billing after timesheets are entered. Construction companies are required to conform to specific AIA billing formats. Government contract billing also has unique characteristics and formats. The flexibility of invoice formats offered by project software enables a billing process and format that will meet the requirements for your specific industry.
- 25. Project Analysis.** Key reports for project analysis include Earned Value Analysis (EVA), budget to completion, budget to actual, project status, realization reports, job cost tracking, revenue stream analysis and profitability analysis. This information is important for evaluating project results and developing better estimates for future projects.

IV. Conclusion

Project software can be a very effective tool for project-based companies and government organizations. While some companies simply need to track the cost of an internal project, others have sophisticated resource management, project accounting and billing requirements.

Project software will continue to evolve and grow as these products are continually developed and functionality is expanded. PSA and Internet enabled project software are the hot developments of today. Tomorrow will bring even more technological and functional advances to enhance the ability to schedule resources, estimate cost, track the status, and analyze the results of projects.

When you are selecting software in this category, be careful to choose software that meets most of your key requirements and is within your budget. If you select software that has far more functionality than you need, the total cost of ownership will be high and the software may be too complex for you to successfully implement and maintain.

About SoftResources LLC

SoftResources LLC is an unbiased software selection consulting group that assists companies, government, and non-profit entities through the software selection process. Their four main areas of service include: (1) Business Technology Assessments, (2) Software Selection, (3) VAR/Implementation Service Provider Selection, & (4) Contract Review and Negotiation. This guide is written based on SoftResources experience in helping hundreds of companies of all sizes and industries find the right software to fit their needs. SoftResources maintains no ties with any software vendor to assure strict objectivity in the software vendor, product, and Value Added Reseller (VAR)/Implementation Service Provider recommendations to their clients.