

The Best Practices Guide to Selecting Construction Software

*A Construction Software Advice
White Paper*



August 2006

If you are like most construction executives, you don't view yourself as a software technology expert. In fact, you probably approach new information technology (IT) projects with trepidation and hand it off to the back-office staff or third-party consultants. This is an understandable and healthy fear given that the majority of software projects fail.

This is also one of the reasons why the construction industry lags behind other industries in software technology adoption. While large manufacturers, retailers, and financial services firms charge into the 21st century with optimized supply chains and web-based customer management applications, too many small or mid-size contractors are still estimating with pencil and paper or job costing with a pocket full of receipts.

The good news is that you already have the experience you need to change your company's success with IT; the same skills that make for effective construction estimating and project management can be applied to software selection. Just like constructing a new building, selecting software requires a detailed set of plans, an accurate budget and meticulous project management.

Get over your fear of technology and you can be on your way to the first of many successful IT projects. It won't be long before these projects result in more accurate estimates, more efficient projects and a healthier bottom line.

...too many small or mid-size contractors are still estimating with pencil and paper or job costing with a pocket full of receipts.

Leading Causes of IT Project Failure

There are many reasons why IT projects fall short (when they do), but we've isolated what we believe are the top five. Importantly, when projects do fail, it typically has more to do with the selection and implementation process, not the underlying software.

- *Limited budgeting and planning.* Too often the decision to pursue a new software purchase is made without developing a project plan and budget. Similar to good preconstruction management, software buyers need detailed plans, a budget and a clear set of goals. Without well-defined goals, an otherwise successful project could "fail" relative to aggressive, but previously unspoken, expectations.
- *The wrong team for the job.* You wouldn't have your drywall subs lay your foundation, so why do so many firms relegate software selection to the wrong staff? Software projects often lack a senior executive sponsor, a competent project manager or input from end-users of the application.
- *Poor requirements planning.* Engaging software vendors in a sales process before you know what you want is a recipe for confusion and failure. Many buyers fail to reconsider their business processes and interview end-users for

requirements. They end up deploying irrelevant features or automating existing, inefficient processes.

- *Lack of a rigorous selection process.* Too many software products have been purchased on the golf course or with a generally apathetic approach to selection. If you buy the wrong product, the project will fail no matter how well you manage the implementation. Too many buyers get overwhelmed and are easy prey for aggressive salespeople.
- *Weak change management or training.* The software has been selected, purchased and implemented - what if no one uses it? Many companies fail to communicate the benefits of the new software and train their users properly. The result is what software industry veterans call "shelfware" - when users revert to the old way of doing things (e.g. pencil and paper) or worse, end up using two redundant applications.

Too many software products have been purchased on the golf course or with a generally apathetic approach to selection.

Now that we have identified the leading reasons for IT project failure, we will outline in ten clear steps how construction companies can manage an efficient selection process that ensures success.

1. Assemble the Right Team

First, get the right team on the project. Start with identifying an executive-level project sponsor who will ensure the project gets the right funding and attention throughout the organization. Next, you'll need a project manager who will oversee all details of the project from start to finish. Finally, you'll need to identify end-users that will enthusiastically contribute their requirements and ideas for improving processes. If the system will affect people from different departments - and it most likely will - be sure the team represents each of those departments.

If you are a larger firm with your own IT department, you will of course have IT staff involved, but it is important that software selection is not treated as a technical exercise; the "business" side of the house must have substantial influence on the process. Be sure that each team member has the time and energy for the project; software selection cannot be a hobby or side project.

2. Establish Clear Goals for the Project

Once the team is selected and assembled, a good first step is to outline the goals of the project. These goals will justify the project expense and guide the team as difficult decisions arise. All choices during the project should be weighed according to how well they help achieve these goals. Examples of common project goals include:

- develop more accurate estimates,
- improve coordination between the field and the office;
- speed up change order approvals or submittals;

- close the books faster and more regularly; or,
- track job costs more accurately.

3. Build a Detailed Project Schedule

The next step is to create a project schedule that outlines all the major activities and their sub-tasks. Just like a construction project, you should consider each activity's various dependencies and resource requirements. Be sure to assign an owner to each activity and even to each task. The project schedule itself can be as simple as an Excel spreadsheet with the various tasks listed down the rows and responsibility, dates, status and notes across the top.

The more ambitious project manager might use their existing project management software to manage the project with Gantt charts and a Critical Path Method network diagram. See **Appendix A** for an example of a simple project schedule.

The more ambitious project manager might use their existing project management software to manage the project with Gantt charts and a Critical Path Method network diagram.

4. Create a Budget for the Project

An otherwise successful software project could be considered a failure if it comes in over budget. That's why it is critical to have an accurate budget to work against. The biggest budgeting problems occur when the project team fails to account for costs outside of the software itself. Some of the more commonly overlooked costs relate to:

- new computer hardware required to run the software;
- platform software requirements such as a new database;
- consultants to help install and customize the software;
- ongoing support and maintenance subscriptions; and,
- new networking gear to operate client/server systems.

It is important to approach the budget process from both the "top-down" and "bottom-up." That is, create a budget based on the total funds available to fund the project (top-down) as well as one based on the costs of the individual components of the project (bottom-up). Rationalize the two.

More than likely, your budget will change throughout the selection process. You may encounter unforeseen costs or expand the scope of the project. These changes are to be expected, but be sure to revise your budget accordingly and communicate it to all project participants and senior executives.

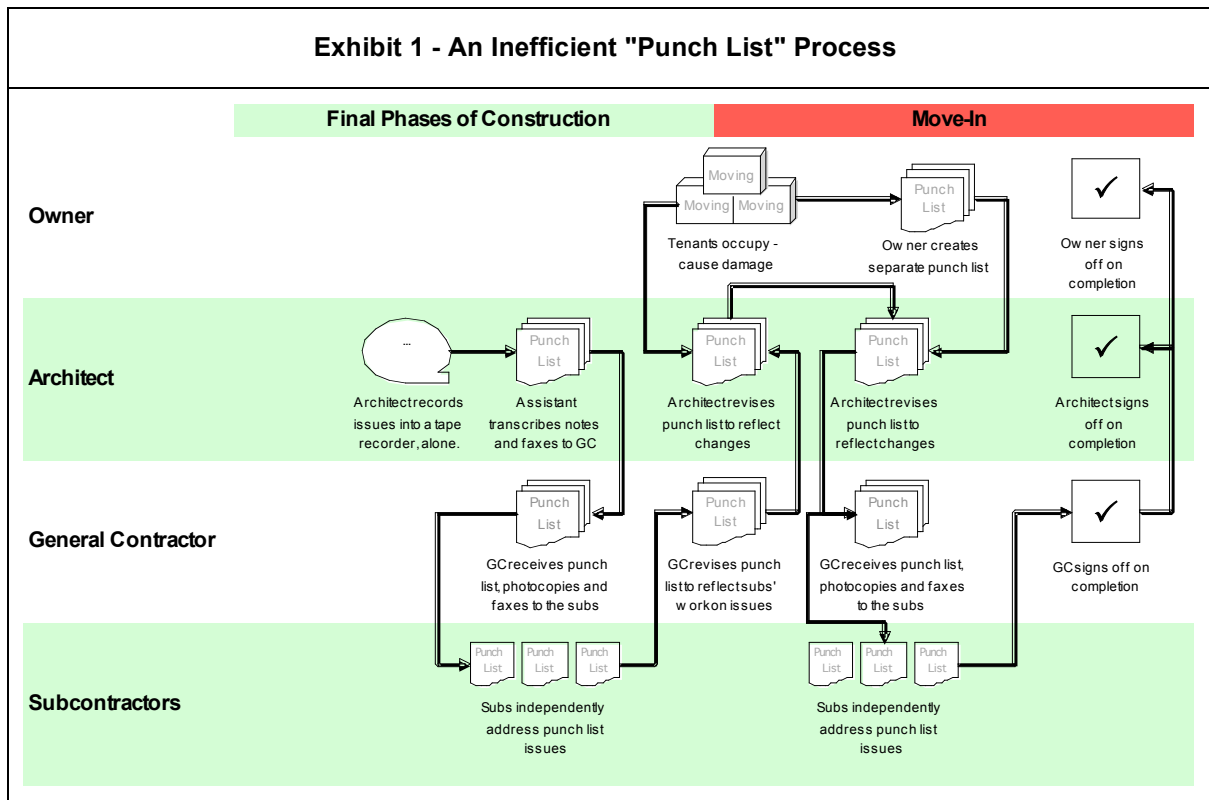
5. Define Your Requirements

The next step is perhaps the most important in the entire process: defining the functional and technical requirements you have for the new system. As software selection practices have evolved,

A Best Practices Guide to Selecting Construction Software

requirement planning has shifted from simply a list of features - often influenced by software vendor marketing - to a more deliberate, thoughtful analysis of "current" versus "optimal" business processes.

This requires that the project team maps out existing business processes and then considers how each could be improved. A flow chart such as that shown in **Exhibit 1** is a great way to illustrate these processes. In this case, we are mapping out a fictitious general contractor's current process for managing a "punch list" just prior to project completion.



Notice that the current process is highly inefficient:

- There is no single system for recording punch list issues
- Each party does their own walk-through;
- There are inefficient, paper-based processes; and,
- Tenants move in prior to punch list completion.

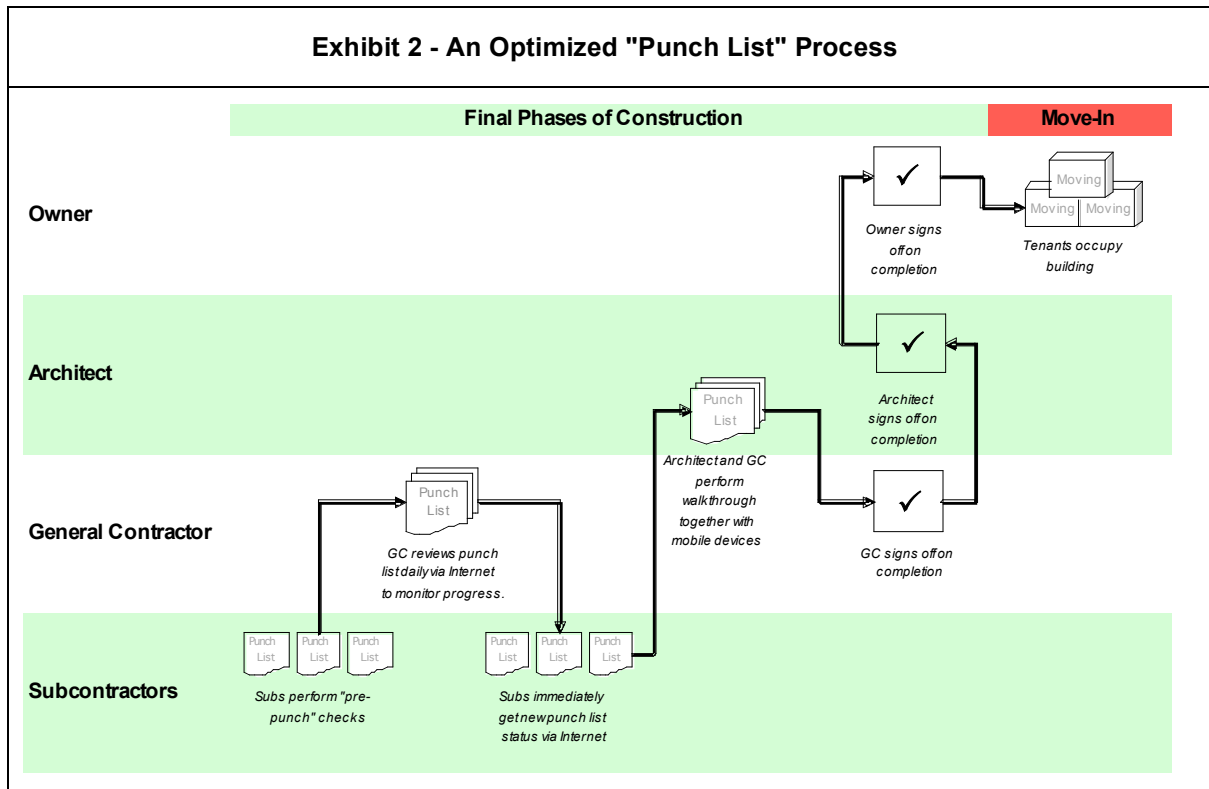
Automating this current process "as is" would provide little, if any, value to the general contractor. Software on its own cannot fix this mess.

Instead, the project team needs to map out a new, optimal punch list process, consider what technology is required to enable it and then

A Best Practices Guide to Selecting Construction Software

add those capabilities as functional requirements for the new software system.

An example of an optimal process is shown in **Exhibit 2**.



During this process optimization, it is critical to involve end-users and understand what they like and dislike about the current systems and processes. The project team must invest time and energy in interviewing these users and understand their opinions. At the same time, the project team must always "second guess" user input; some users may be too set in their ways to conceive of a more efficient process. Put your most thoughtful, creative employees on task.

Regardless, make this an iterative process where users are heavily involved. Perhaps the greatest benefit from involving these users will come when the new system is rolled out and they feel fully invested in its success. Adoption will increase as a result.

6. Draft a Request for Proposal and Evaluation Framework

Once the project team has finished mapping out their business processes, it's time to draft a request for proposal (RFP) and an evaluation framework.

A Best Practices Guide to Selecting Construction Software

The RFP will take the form of a Microsoft Word ® document of questions that can be sent to software vendors for their response. It should cover all of the features and functions identified as critical during the process mapping stage. It should also cover technical requirements, such as which databases and operating systems are supported, or if the software is offered as "Software as a Service" (SaaS) such that it is hosted by the vendor and accessed over the Internet through a web browser.

Additional RFP questions may cover which other vendors' software systems the product integrates with; for example, if you are buying a new estimating software tool, you may require that it integrate with your existing job costing application to export estimates and budgets. The RFP is also a good example to press the vendor on corporate issues such as their financial strength and long-term strategy.

The RFP should be sent to your "short list" of software vendors (more on this later) with a two to four week deadline for responses. Keep in mind that the effort required of a construction firm to develop an RFP - and of the vendors to respond to it - may not be justified for small projects (<\$5,000 software purchase). In this case, it makes sense to skip to the Evaluation Framework and track each vendor's capabilities yourself.

An evaluation framework is a spreadsheet in which you track each product's capabilities relative to your list of requirements. Typically this would consist of a Microsoft Excel ® spreadsheet with all of your requirements listed in rows down the left side and each of your short list vendors represented by a different column, such as the illustration in **Exhibit 3**.

An evaluation framework is a spreadsheet in which you track each product's capabilities relative to your list of requirements.

Free, Excel-based evaluation framework templates can be downloaded through *Construction Software Advice* (www.softwareadvice.com/construction). Construction Software Advice offers separate templates for:

- accounting and job costing
- project management
- estimating and takeoff

At this point in the process, you should enter all of your requirements in the evaluation framework, but don't evaluate specific products yet. An important step in creating an evaluation framework process is to weigh each requirement based on its relative importance (e.g. a scale of one to five). For example, certain features will be "must haves" and earn a four or five weighting. Others will be less important and therefore receive a lower score between one and three.

Your relative weightings can be used later to mathematically adjust the overall score of each product you evaluate, or simply as a

A Best Practices Guide to Selecting Construction Software

reference of which features are most important to use as an evaluation criteria.

Exhibit 3 - An Excel-Based Evaluation Framework

	Weighting (0, 1 - 5)	Vendor Scores Based on Evaluation (0, 1 - 10)				
		Vendor A	Vendor B	Vendor C	Vendor D	Vendor E
Project Scheduling						
Gantt Chart graphical scheduling tool	5	9	6	8	6	8
Ability to drill-down into each activity or step	5	8	7	7	5	7
Actual versus forecast comparisons for time and cost	4	5	8	9	4	8
Multi-level task hierarchy (i.e. high-level activities and sub steps)	5	7	9	9	6	7
Weighting of sub steps to track percent completion	4	9	8	7	7	8
Float path analysis	3	7	6	8	6	9
Critical path analysis	5	8	7	9	5	7
Activity network diagrams	5	6	7	8	4	8
Timescaled logic diagrams	2	7	9	7	5	9
Histograms	4	9	9	7	6	9
Distribution curves for resource allocation	3	7	8	8	5	8
Day, week, month and project views	5	8	7	7	6	9
Version to version schedule comparisons	4	9	7	9	5	7
Ability to email entire project schedule to others	4	7	6	9	4	7
Ability to email individual "to do" lists to stakeholders	5	6	8	8	6	6

The evaluation framework should not be entirely about product functionality. Other areas to assess each vendor include:

- The financial and strategic viability of the vendor - will they be in existence and relevant five years from now?
- How well does each company's staff know your industry or trade?
- Do they support those technologies on which your company may have standardized (e.g. Microsoft, Oracle, IBM)?

7. Develop a Short List of Products

Now that you have defined your requirements and built a framework for evaluating software products, it is time to figure out which vendors to assess. The first step in this process is to build a "short list" of software products.

A short list is a list of three to five products that meet your high-level requirements. If your short list grows beyond five vendors, you will not likely be able to evaluate each in sufficient detail. If the shortlist is less than three, you are probably overlooking a few good products.

A short list is a list of three to five products that meet your high-level requirements.

A Best Practices Guide to Selecting Construction Software

To build a shortlist, start with a longer list of products assembled from numerous sources, such as:

- Industry trade magazines, especially annual tech issues;
- Trade shows and conventions;
- Recommendations from peers or advisors (e.g. CPAs); and,
- Internet searches and directories.

Once you have this longer list of company, filter it with some high level criteria, such as:

- Does the company serve your specific trade?
- Do they serve your size of business?
- Do they present a professional image (e.g. quality website)?
- Do they meet your technology requirements (e.g. database)?

Building a shortlist is another stage of the selection process where Construction Software Advice can be helpful. Our software search capability will automatically generate a list of potential shortlist products based on your trade, size of business and functional requirements.

8. Evaluate Short List Products

The next step in the process is to evaluate your shortlist of products to choose a single "winner" and a contingency "runner-up." If negotiations and references checks don't go well for the first vendor, you can fall back on the second vendor. This is the point where we recommend that you contact vendors and engage them in a thorough sales process.

Start by sending each vendor a copy of your RFP and ask them to complete it. Concurrently, begin collecting information from each vendor such as brochures, papers, trial versions of their software and on-line demonstrations. You can use this information to evaluate how well each vendor's products match your functional requirements. Use your evaluation framework to track what you learn.

Once you have collected this information and reviewed the RFP responses, you should invite the vendors to demonstrate their products. If the size of the opportunity is large enough, vendors may travel to your offices to perform the demonstration; if not, demonstrations over the Internet are usually sufficient.

It is important that you remain in control during the demonstrations. You need to dictate what functionality and business processes are to be demonstrated, rather than letting the vendor wow you with cool features that may be irrelevant to the requirements you have worked so hard to determine. Toward this end, it is often a good idea to provide the vendor with a custom script of what you would like to see

As each vendor demonstrates their product, use your evaluation framework as a tracking mechanism to rate how well the system handles each of your requirements.

A Best Practices Guide to Selecting Construction Software

demonstrated. Your business process flow charts can come in handy here.

As each vendor demonstrates their product, use your evaluation framework as a tracking mechanism to rate how well the system handles each of your requirements. Other key things to look for in a demonstration include:

- How intuitive does the application appear? Could you learn it quickly without much training?
- Is there a thorough on-line help function for each section?
- How many clicks, windows or pages must you navigate to complete a common task?
- Do the field labels make sense or are they a cryptic?
- Is the look and feel of the application pleasing -- subtle colors and good screen organization?

A couple other steps you might consider in the evaluation process are attending on-line or on-site training classes or joining a user group for a meeting or two. These steps are not necessary, but the added diligence might be worthwhile if the purchase represents a major investment for your company.

After completing all of the demonstrations and reviewing the RFP responses and product literature, it is time to review the evaluation framework in detail and rank each product.

Using the feature-by-feature scores you entered for each product and the weightings you assigned to each requirement, rule out any product that falls short of your most critical requirements. Then prioritize the others according to their performance across all of your important requirements. In some cases, it may be possible to customize the software to bridge certain gaps, but for the most part, try to select the product that most closely meets your requirements.

While there is a temptation to make this a fairly rigid, mathematical process, be sure to "trust your gut" as well. The impression you gain of each vendor during the sales cycle often indicates the way you will be treated throughout the relationship. Prioritize those vendors that are forthcoming, attentive and demonstrate a strong knowledge of your industry.

Before you settle on one vendor, be sure to give each vendor an opportunity to respond to your concerns. Sometime you may have overlooked an easy "workaround" to a functional shortcoming or you may have misunderstood something during the evaluation process.

Finally, select one vendor that you feel is best, as well as a runner-up that you can go to if negotiations with the first vendor do not work out.

9. Check Customer References

It is critical at this point that you do your "due diligence" by checking the winning vendor's customer references. Moreover, you need to "play detective" and dig into these references. Keep in mind that the references to which a vendor refers you are most likely their happiest customers and may well be rewarded for saying good things (think court-side NBA tickets).

To offset such "cherry picking," require at least three customer references and prepare a detailed list of questions that require specific answers rather than broad, positive generalities. Even better, try to locate your own customer references by networking with industry peers, attending trade shows or user groups and talking to your industry association. If a vendor has a bad reputation, it usually doesn't take long to figure it out.

...try to locate your own customer references by networking with industry peers, attending trade shows or user groups and talking to your industry association.

10. Negotiate the Deal

The final step in your selection process is negotiating the right deal. Don't stop being diligent just because the finish line is in sight. This step of the process will determine the price you pay for the software, the level of service you receive and the recourse you have if things go wrong.

First, consider what type of license the vendor offers. Is it a perpetual license whereby you own the software forever, or is it a subscription where you will make regular, smaller payments to continue to use the software. There are positives and negatives to both models.

Second, how is the software priced? By total users, concurrent users, number of projects managed? Each model may result in a very different price depending on how your business is organized. Make sure the vendor's pricing works for you.

Next, examine the maintenance and customer support policies. During what hours can you receive support and how fast can you expect a response when you submit an issue? These types of policies are typically covered in the vendor's Service Level Agreement (SLA), and sometimes you can request a higher level of service. Also examine the warranty and the recourse you have if the product is defective in some way.

Finally, determine your rights to new versions of the software and periodic upgrades. Typically you will be entitled to regular upgrades that fix "bugs" or support new platform technologies. You may not be entitled to major new versions of the software, which is something you will want three to five years down the road.

Keep in mind that for medium to large size deals, there is typically room to negotiate with the vendor on all of these points. The larger the check you are asked to write, the more room for negotiation. The exception is very small deals where the software is sold as a "shrink

wrapped" product for under \$1,000. These vendors may not be willing or able to offer discounts and non-standard contract terms.

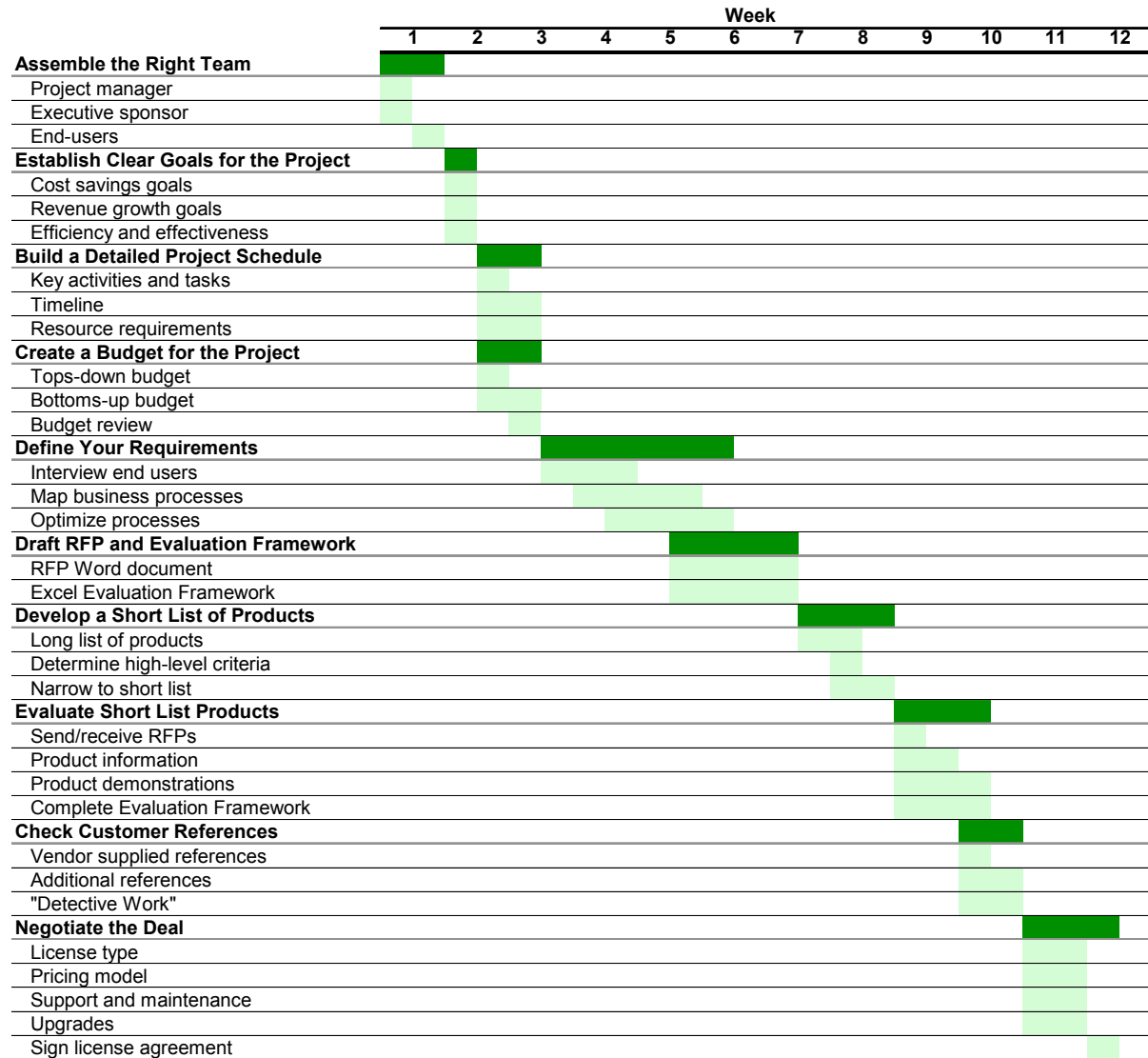
Conclusion

Software selection is not easy and should never be considered a second tier project. The right software, implemented properly, can have a major positive effect on your business. Follow these guidelines and you are on your way to IT project success.

A Best Practices Guide to Selecting Construction Software

Appendix A: Software Selection Activities and Tasks

Below is an example Gantt chart outlining a standard software selection process. The timeframe can be condensed or expanded depending on the size of the project, but twelve weeks is not an unreasonable amount of time to select software.





Construction Software Advice helps small- and medium-size businesses make the right technology decisions. Visitors to Construction Software Advice can read insightful articles, learn best practices, compare products and build a short list of software vendors to contact for further research. The company's online community brings industry experts and software vendors together to provide an unparalleled resource for software buyers. This powerful community-driven content model ensures a wide range of opinions and expertise, while enabling Construction Software Advice to remain a free resource.

Construction Software Advice can be found on the Web at <http://www.softwareadvice.com/construction>.