To Be, or Not to Be

By Lynne Nix and Jim Highsmith

Printed in Software Development Magazine, July 1996

Start Slow, Finish Fast

Software project failure is endemic in our industry:

> *"Our research shows a staggering 31.1 percent of projects will get canceled before they are ever completed. Further results indicate 52.7 percent of projects will overrun their initial cost estimates by 189 percent.*[i]*"*

Everyone is in a hurry to start, either because management has already delayed six months in initiating the project and needs to make up for lost time, or some competitor has just struck, or – well, you can fill in the blank. High school sex education classes are often given *after* the participants are already pregnant, analogous to the timing problems related to understanding many of our software projects.

"Full speed ahead, damn the torpedoes, don't be a wimp" – the beginning of many projects are injected with a tremendous oversupply of testosterone. Three or four months into the project, someone finally realizes no one knows what the project is all about, and "re-evaluation" sets in.

> *"Over one-third of these same challenged or impaired projects experienced time overruns of 100-200 percent. One of the major causes of both cost and time overruns is restarts.* ***For every 100 projects that start, there are 94 restarts****.*[ii]*"*

Ninety four percent is an incredible figure! According to Jim Johnson's figures, we lose $78 billion dollars a year on canceled IT applications development projects. A good feasibility study process can improve these numbers substantially.

Feasibility studies answer three questions:

1.What is this project all about?

2. Should we do this project?

3. How should we go about this project?

A concept is not a project. An concept is a beginning, a thing to be examined and nurtured into a full blown project. A feasibility study is the place to nurture, to

© 1996-2004 Knowledge Structures, Inc.

examine, to question. Feasibility studies don't have to take a long time, they just need to be done in the right way, and with the correct attitude.

What is this project all about?

To paraphrase Lewis Carroll, "If we don't know where we want to go, then any path will do." One primary reason for project restarts, or outright failure, is the lack of a project mission, which at this early point in the project means a careful analysis of the problems/opportunities and their impact on the organization. Team members, customers, and other stakeholders need a good understanding of the project's fundamental components -- goals, objectives, scope, problem statement, constraints, vision. A good test of whether or not a project is understood is to walk around and ask various participants, "What is this project all about?" The more complicated the answer, the more trouble the project is in. A crisp, business-oriented, non-technical answer usually means the project's groundwork has been well established. The answer could be what we refer to as a project objective statement (a short, concise, high-level written summary statement of the project), for example: "To identify and deliver a production ready, state of the art loan servicing system to include on-line collections and accounting subsystems by March 31, 1997."

Should we do this project?

The second major question answered by a good feasibility study is whether or not the project should proceed. The very name "feasibility" indicates one possible outcome is not to proceed. A significant portion of the $78 billion loss on software projects comes from projects that should never have gotten past the feasibility stage, but got caught up in corporate egos and politics. Once the problems and opportunities have been identified, the next task of the feasibility study is to define the criteria for an acceptable solution. Feasibility (acceptability) incorporates political, economic, technical, and organizational components. For example, if the Senior VP of Manufacturing demands project xyz be done, why spend weeks coming up with a detailed cost/benefit analysis? In this case the "should" question is fairly easy to answer. It is more effective to spend the remaining time answering the other feasibility questions.

The second phase of answering the "should" question is to identify the alternatives and recommend one. The alternative of *not* continuing the project should always be thoroughly considered.

How should we go about this project?

A good feasibility study says more than "do it." In addition to defining the project objectives and deciding whether or not to proceed, the feasibility study needs to provide at least a broad outline of how to proceed. This involves preparing an initial,

© 1996-2004 Knowledge Structures, Inc.

high-level project plan that provides a gross project *sizing,* identifies major milestones, and estimates resource needs. A plan of action serves two purposes, it gives the follow-on team a direction and it forces the feasibility study team into thinking about critical implementation issues.

Conducting the Feasibility Study

With this background of the overall purpose of a feasibility study and its components, the remainder of this article will concentrate on the specific activities of such a study. The following process is easily tailored to any organization, project, or development approach. It covers the basics of what is required to build a solid business case, allowing management to make an informed decision about funding or canceling a project. Given the restrictions of length, we have oriented this article toward the feasibility of internal software projects. The process is similar for commercial software products, however the details would need to be tailored and more marketing-oriented.

The structure of the *Team* doing a feasibility study depends on the project. The important questions in determining a study team composition are:

1.Who are the stakeholders in the project?

2.Who is representing each stakeholder?

On projects of any size, one serious feasibility study mistake is misidentification of the stakeholders. It is important to have a *client* executive sponsor for the study. The primary feasibility analyst should come from the client organization, whereas the IS representative should be viewed as a subject matter expert. All stakeholders should be identified, but identification alone isn't enough -- they need to feel they are adequately *represented* during the study phase.

1. Identify the problem or opportunity

A feasibility study (FS) is usually the response to some client identified problem or opportunity. Clearly understanding the problem or opportunity provides the framework for all of the FS activities. Go to the source -- the individual(s) who identified the issue – to provide information as to the origins and details of the problem/opportunity.

Avoid the tendency to jump to solutions without first carefully stating the problem. It takes discipline to keep asking, "Am I describing a solution instead of a problem? If so, what is the problem this solution solves? Is it really the root problem, or is it merely a symptom?"

Problems or opportunities should relate to:

- increasing revenues
- avoiding costs

© 1996-2004 Knowledge Structures, Inc.

- improving customer satisfaction
- complying with regulatory agencies
- improving the competitive situation

Any problem or opportunity not traceable to one of these benefits is suspect. An example of a problem statement is:

> *Sales have increased to 4,000 order per day on average with projected increases of 25% per year for the next five years. The current order processing system cycles allow only an average of 3,500 orders to be processed in a 24-hour period.*

All impacted client groups should be interviewed (or use a JAD session) to ensure the problem/opportunity has been defined from the global perspective.

The following steps impose a helpful discipline on problem analysis:

- Describe the Current Situation: Ask yourself, "What is happening now? What is the effect on the organization? What is the effect on our customers?"
- Describe the Desired Situation: Ask, "What should happen? How should employees be able to handle this situation? What would satisfy our customers? What should we do to be more competitive?"
- Identify Possible Causes: Ask, "What is forcing us to do business in the current manner? Why does the current system work the way it does?"
- List Potential Solutions: Ask, " What changes could we make to move toward the desired situation? Would the use of information technology help to reach the desired situation? If so, describe the general features of the solution."

2. Define the Objectives and Solution Evaluation Criteria

Once the problems and opportunities are clear, they need to be restated as clear business and technical objectives that form the basis for evaluating the alternative solutions. Separating business and technical objectives is important. Business objectives address one of the five areas (increasing revenue, etc.) mentioned earlier. Technical objectives *support* business objectives. In identifying the business objectives, first ask, "What are the business results to be achieved?"

In order for the objectives to be effective in evaluating alternatives and guiding the project, they should be stated as clearly and measurably as possible. A clear objective contains the following components:

© 1996-2004 Knowledge Structures, Inc.

Action	What will the solution do?
Focus	In what areas will it do it?
Quantity	By how much?
Quality	With what level of achievement?
Time	By when?

A business objective example is:

> *Increase competitiveness (target market share increase of 4%) and revenues (target increase of $35,000 per year) and improve customer satisfaction (reduce complaints by 30%) by implementing the new two-day item delivery process by August. The process should be capable of handling up to 10,000 items per day, with an average of 7,000.*

A technical objective supporting this business objective might be:

> *Implement a new, automated item processing application and associated client/server hardware and terminals, to process up to 10,000 items per day, with an average of 7,000 per day, and allow for a 10% annual growth rate.*

The *business organization* is responsible for achieving the *business objectives* (revenue, etc.) while the *technical organization* is only responsible for the *technical objectives.*

Other evaluation criteria, such as risk, should also be added to the evaluation. Two risk areas often misjudged are complexity (business process, technical) and resources capability. While complexity is underestimated, organizations at the same time *overestimate* their technical and project management capabilities – a deadly combination. So one evaluation criteria might be – "Can we implement this alternative with our current staff?"

3. Identify and analyze alternatives

Identify alternatives

The highest level alternatives are: 1) do nothing; 2) maintain the current system; and, 3) build a new system. Most often, however, analyzing the third option in more detail requires the most work. Is all of the system to be developed? Developed internally or externally or purchased off the shelf. On which platforms (client/server, mainframe, internet)? This is where potential for real innovation and creativity (brainstorming?) arises.

Clearly describe each proposed solution and how well it meets the business and technical objectives. Define the scope of the solution, the high-level technical design approach, the time frame required to implement the solution, and any associated

© 1996-2004 Knowledge Structures, Inc.

assumptions and constraints. In order to adequately accomplish this step, preliminary requirements definition, and high-level technical designs will probably be required.

Analyze each alternative

When all alternatives have been identified, a matrix presentation can assist in analyzing alternatives against business and technical objectives by clearly showing which alternative meets the largest number of objectives. The matrix identifies the alternatives in rows along the left-hand side, the objectives to be met across the top and appropriate rankings ($$, scale numbers) in the matrix cells.

A cost/benefit analysis should be done for each alternative. Unfortunately it is always easier to quantify costs than benefits. Even so, care should be taken to quantify benefits as precisely as possible (reducing invoice cycle time from 12 to 2 days, saving $35,000 per month in operating expenses). Well thought-out benefits are a part of "selling" any proposed solution. *Intangible* benefits should be quantified to the extent possible. While quantified, intangible benefits seem an oxymoron, it can be accomplished by relative weighting factors or "soft" dollars. For example, improving customer satisfaction may be difficult to estimate precisely, but alternatives could be ranked on a 1-7 scale.

One component of eventual project success, as well as an important evaluation criteria for alternative solutions, is risk. Each alternative's functional, financial, organizational, and technical risk should be analyzed using one of the many risk evaluation checklists available. Most risk analyses suffers from political timidity. People are reluctant to talk about risk, because it might be interpreted as being pessimistic. Unfortunately, this dooms many projects to failure because they pick an overly risky alternative and then fail to actively manage the risks.

4. Recommend the best alternative

All of the alternatives meeting the acceptable solution criteria are now compared. Alternatives are also evaluated for the fit with the organization's strategy, impact on existing operation, special equipment needs, and source of funding. The alternative best suiting the solution criteria is used to develop the preliminary implementation plan for the project and is forwarded to the sponsor for approval and funding.

Give a frank assessment of the recommended alternative. Don't over-sell. The sponsor won't trust the recommendation unless she can trust the analysis. Be rational and circumspect. Provide the sponsor with all of the rationale necessary to clearly understand why the one proposed alternative is the clear choice among all of the possibilities.

Unfortunately, in the real world of problem solving there is often no clear winner. One solution may meet most of the objectives, but not all. Worse yet, there may be no

© 1996-2004 Knowledge Structures, Inc.

alternative adequately meeting the objectives. Often, objectives will need to be revisited with the client, or additional alternative analysis information collected. Too often the technical staff becomes discouraged because the decision appears to be made on a "political" rather than an analytical basis. The feasibility team should view *success* as providing a comprehensive information package, not the decision itself. In fact, a decision to abandon the project should be viewed as a tremendous success, look how much money was saved!

5. Prepare an implementation plan

The last step of conducting a feasibility study is to develop a high-level implementation plan. As mentioned earlier, such a plan serves both to give the follow-on team direction and forces the feasibility study team into thinking about critical implementation issues. The plan should identify implementation approaches such as – will this be a more traditional or a "RAD" style project? What equipment, facilities, and people will be required for implementation? Will the project use outside contract assistance? Actually, some implementation planning will be required in order to provide adequate cost information for alternative solutions.

Because software projects are *learning* journeys, we recommend using *a Phase-Limited Commitment* approach where work estimates for the next milestone are developed in detail, while only general estimates are developed for subsequent milestones.[iii] As each milestone is reached, the remaining work is planned in more detail.

To Be, or Not To Be

"To be, or not to be – that is the question." To paraphrase Shakespeare, is this project to be or is it not to be? That is the question a feasibility study answers. The success or failure of a project is often decided very early. There are two keys to effective feasibility studies. The first is to have the right attitude, and the second is to have a good approach. Having a good approach without the proper organizational commitment to "listening" to the answers doesn't work well – it results in substance without form. Having a commitment to listen, but without the substance of a reasonable feasibility study process isn't a lot better. We hope the concepts and process description in this article assist in getting *your* projects off to a better start.

---

[i] Jim Johnson, "Creating Chaos", *American Programmer*, July 1995, pg. 4.
[ii] Ibid., pg. 5.
[iii] For more information on RAD and phase-limited commitment, see Jim Highsmith and Sam Bayer, "RADical Software Development®", *American Programmer*, June 1994.

© 1996-2004 Knowledge Structures, Inc.