A Solution Matrix White Paper

The IT Business Case: Keys to Accuracy and Credibility

Marty J. Schmidt, MBA, PhD, President, Solution Matrix Ltd.

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Introduction

Since the mid 1980's we have worked with many dozens of CIOs, IS/IT directors, and financial executives across the Americas and Europe to build business cases for planned IT actions or acquisitions. This paper presents some practical findings from this experience—proven techniques for bringing credibility and accuracy to the IT business case.

These managers started with a wide range of personal motivations and needs. Some focused on getting funds for specific IT projects, others wanted high level "buy-in" for strategic decisions, a few needed to justify their stewardship of IT money over the last few years. What they had in common was a need to build an accurate, credible business case. Most had already developed positive ROI figures of their own before we started working together (few had started out expecting to show a net loss). To an individual, however, they reported frustration in trying to "sell" the business case inside their own organizations. Few were truly comfortable with their own ability to estimate IT costs and benefits in advance.

What these managers had in common was a need to build an accurate, credible business case...few were truly comfortable with their own ability to estimate IT costs and benefits.

A short list of what it takes to produce a good IT business case holds few surprises: one needs to be thorough (track down all possible impacts, costs, and benefits), clear and logical (articulate the cause and effect chain that leads to each cost/benefit impact), objective (unbiased, including everything that is material, good or bad), and systematic (have good models and rules for finding and summarizing values). Financial talent also helps as does a solid grasp of the interplay between IT capacity, service levels, user needs, and IT resource requirements. Intelligent managers appreciate this much already and—as you know if you've heard from the IT consulting community lately—there are many new methods on the market claiming these virtues. Yet IT ROI figures still fail to "come true," still raise cries of "Soft Benefits!" and still fail to instill confidence in senior management. Why? What can be done about it?

The content of this paper is covered in detail in the book "The Business Case Guide" (ISBN 1-929500-00-9). For ordering information, visit the Solution Matrix web site at www.solutionmatrix.com. Solution Matrix Ltd. also provides professional training on these topics and a range of consulting services. For more information on Solution Matrix products and services see page 19.

Following are ten key contributors to business case success—*requirements* for success in many cases—that are not always present. If you have ever proposed an IT investment and then failed to gain approval, or failed to deliver expected returns, you may find here just what was missing. If you are about to propose an IT acquisition or action, consider carefully how you would address the issues behind each item.

Key 1: Recruit and Use a Core Team

If you are preparing a business case for your own management, and you see your own organization as the primary beneficiary of the proposed technology, it is tempting to take sole responsibility for building the case that will justify it: have your staff go off and find all the costs and benefits, give yourself the job of adding up their cost/benefit lists, and then present the results to your manager or the Capital Review Committee. If you are a consultant building the case for a client, it is also tempting to do the case yourself—to be sure it comes out "right" and to highlight your own expertise and value. There are serious risks, however, in the "solo" approach to building an IT business case.

IT impact analysis requires assumptions, arbitrary judgments, and the new data–information that goes beyond existing budgets and business plans.

The problem is the nature of information technology in business today: IT is integral to almost every functional area and IT actions have financial consequences that cross boundaries of all kinds (organizations, management levels, budget categories, planning periods). As a result, good IT impact analysis in a complex environment requires assumptions, arbitrary judgments, and the development of new data—new information that goes beyond existing budgets and business plans. This means that two people working independently can evaluate the same IT investment proposal, use correct financial arithmetic, and still produce quite different business case results.

All of this adds to the reasons for recruiting and cultivating a "Core Team" to help you design the case and establish credibility. This group is *not* the project team that actually does the hard, time-consuming work (digging into databases, interviewing experts, analyzing workflow in detail, and so on). The Core Team might be also be called the "Review Committee," "Steering Group," or something similar, because it has a very specific "executive" role to play. When recruiting a Core Team, try to include IT users and their managers, senior financial managers, and other high level executives directly responsible for the company's financial performance.

Here is what the team can accomplish for you in perhaps three or four meetings over the course of the business case project. The first kind of team contribution is obvious to all:

A. The Core Team will help fill in the cost and benefits models with line items and ideas you may otherwise overlook. The team can also bring other critical expertise and information to the table. For instance:

   - Operational line managers on the team can help "cost" and "value" the operational impact of IT actions in their own areas

(manufacturing, procurement, marketing, sales, customer service, facilities, shipping, etc.).

- A financial expert can help connect the IT business case with the organization's long-range business plan—a great aid to "sizing" IT contributions to expected business benefits.
- A Human Resources expert can help identify and gauge the "people costs" of the action: job levels, salaries, overhead, training requirements, hiring and relocation, and so on.
- Very senior managers should be able to help prioritize, legitimize, and assign value to any IT contributions to the organization's strategic business objectives.

That much of the Core Team's role is obvious. Some other roles for the team are less obvious but equally crucial. From the project owner's point of view, these might even look like steps in the *Machiavellian* direction.

Most people do not want to see something they work on to fail.

B. The team can be the vehicle for spreading a sense of ownership for the business case. Those who get involved with producing a business case naturally develop a sense of ownership for it. In meetings and discussions, team member contribute to case design and development. Inevitably, it becomes *their* case coming up for review as well as it is yours. Most people do not want to see something they work on fail.

C. In a competitive or critical setting, your arbitrary or subjective judgments will not have to be announced and defended at the same time—if they are worked out early and communicated widely by the Core Team. When review day comes, critics may still argue your interpretation of case *results*, but you leave them little room to question your methods or data.

D. Finally, you may be able to use the Core Team as an effective tool for handling people who are seriously difficult critics of your proposal. If you face people who fit that description, it *may* be advisable to bring one or more of them onto the Core Team at the outset (The critical word here is *may*. You must judge the wisdom of taking this step, based on your knowledge of the individuals in question). As members of the Core Team, they will have objected and contributed everything they have to say *before* the final review, assuring them that their positions are "on the record," and giving you fewer critical surprises late in the game.

Key 2. Agree Early on the Appropriate Cost Model

A good *cost model* is essential to producing and to selling an IT analysis or IT business case. It is also very useful for managing costs and benefits during implementation. A good first task for the Core Team is to complete and approve the structure of cost model for the business case analysis.

The cost model is important because the link between technology and specific costs (and benefits) is often unclear or hidden, and because you need a rational system for deciding what belongs in the business case and what does not. The cost model does two things:

You need a rational system for deciding what belongs in the business case and what does not.

First, the model helps you track down everything relevant—all the relevant costs impacts that result from the acquisition or action—while helping prevent double counting. A good model shows every possible place to look for cost impact and it clarifies which items and data to omit, as well. Should your IT business case include the cost of user training? Should it include outside consultant fees? You won't have to anguish over a response if you have already established a cost model that is clear and appropriate. And, when a model's completeness is self-evident and its boundaries are clear, it becomes a vehicle for assuring *others* that you have been complete, and free of personal bias in deciding what to include and what to exclude.

Second, models bring together cost or benefit items that have common causes and which change together (e.g., expenses that have the same cost drivers). This gives management effective "real time" financial control during implementation and normal operation.

To understand the role of models in IT cost/benefit analysis, start with the business impacts that might follow an IT action, shown below in Table 1:

Business Impact		***Consequence***
• Cost increase	↑ Cost Impacts ↓	Net Cost
• Continuing cost		Neutral
• Cost decrease		Net Benefit
• Avoided cost		
• Cash inflow		
• Tangible but non financial benefit		
• Contribution to strategic business objective		

Table 1. The full range of business impacts that might follow an IT action. Each line item in the business case is an instance of one of these. The cost model (Table 2) will inventory and organize these impacts for the scenarios under study.

The business case, of course, is meant to identify all instances of these and, where possible, assign financial value. From Table 1, however, we can begin to see where cost and benefit terminology sometimes confuses people. The first four lines are *cost impacts*, even though two of them represent "Net Benefit" consequences.

In any case, the cost model identifies and organizes all of the cost impact items. In fact, the model is nothing more than an organized list of all possible cost impacts. The key to its value is in the organization: each cell is a set of related cost items. Items that change together, that need to be managed together, and planned together, appear together in the same cell.

		IT Life Cycle Stages		
		Acquisition & Implementation Costs *Costs at acquisition or during initial implementation*	**Operation Costs** *Periodic or frequently occurring costs that continue 3-5 years.*	**Ongoing Change & Growth Costs** *These costs come with adds, moves and changes to the computing environment*
IT Resources	**Hardware Costs**	• Server system purchase or upgrade • PC Client system purchase • W/S client system purchase • Storage space purchase • Other peripheral HW	• HW maintenance fees • HW lease expenses	• Additional server systems • Additional client systems • Additional server CPUs • System upgrades • Storage space expansion • Other peripheral HW
	Software Costs	• OS/NOS original purchase/license • Application purchase, one-time charge • Development/migration SW purchase	• Periodic SW license fees • SW maintenance/warranty fees	• OS/NOS upgrade • Migration software purchase
	Personnel Costs: IT Staff	• Preplanning costs *In-house or outside consultant* • HW Installation labor • SW Installation labor *OS, OS/NOS utilities, appl* – Install at Server – Install at client • Initial NW set up – Set up user accounts – Directory creation labor – Set up /install NW services – Set up/install NW or mail server • SW migration labor • Initial training costs (professionals) • Professional hiring costs	• Administrative labor – Systems operators – Systems programmers – Applications programmers – Network admin labor – Storage management – IT/IS management – Other Admin • Trouble shooting • Continuing contract labor • Continuing training (professional)	• HW reconfiguring, setup • OS/NOS upgrade labor – Upgrade at Serve – Upgrade at client • NW changes -Administrative costs – Add/move/delete user accounts – Add/move/delete a NW service – Add/change a NW or mail server – Assign/change security • Capacity planning, change planning (in-house) • Capacity planning, change planning/consulting (outside source) • Temporary contract labor • General moving labor
	Personnel Costs: Users	• Initial training costs (users) • Organizational downtime costs during install or upgrade	• User Trouble shooting, system management • User help / other user services • Continuing training (users)	• Additional user training
	NW & Comms	• NW/Comms HW (including NW server systems) • NW/comm SW • Line acquisition/hookup charges • Installation of comm wiring, cables	• Line usage charges • Satellite or other WAN charges • Wireless charges • Outside internet service providers	• NW change planning costs • Additional NW/comm HW and SW • Additional cables, site/preparation for changes
	Other Costs	• Floor space acquisition, renovation, construction • Initial site planning	• Electricity • Security costs (e.g. disaster recovery services)	• Site expansion • Site consolidation, • Site renovation

Table 2. Generic IT Cost Model. Each cell contains cost impact line items.

Table 2 (previous page) is one generic IT cost model that has proven very useful across a wide range of industries and IT actions. Once the case is completed, we can fill in the cells of the model with cost figures for each line item (total line item cost across the entire analysis period) and then create totals for each cell, each row and each column. Table 3, for instance, is an example showing cell totals and marginal totals. The results show one company's 5-year cost projections for a move to client/server computing.

Bringing marginal totals into the picture adds to the model's value as a tool for financial control. Here, marginal totals show costs by IT resource category (vertical dimension), and lifecycle stage (horizontal). Several messages from this example stand out. "People costs" (IT Staff and Users) together make up 48.5% of the 5-year cost picture, for instance. Post acquisition costs make up 73.9% of the total cost story. When planning such a move, the normal temptation is to focus on Hardware and Software acquisition and operation costs (four cells at upper left of Table 3) when choosing vendors, architectures, and transition plans. Real cost control, however, depends on understanding the implication of these choices on the other cost impact areas (many of these are the so-called "hidden costs" of computing).

	Life Cycle Stages				
Resources	Acquisition & Implementation	Operation	Ongoing Changes & Growth	**Total**	**% of Total**
Hardware	$ 1,523	$ 605	$ 924	$ 3,052	21.8%
Software	$ 1,192	$ 545	$ 520	$ 2,257	16.1%
IT Staff	$ 120	$ 3,315	$ 1,472	$ 4,907	35.1%
Users	$ 230	$ 1,342	$ 297	$ 1,869	13.4%
NW & Comms	$ 472	$ 771	$ 110	$ 1,353	9.7%
Other Costs	$ 112	$ 189	$ 238	$ 539	3.9%
Total	$ 3,649	$ 6,767	$ 3,561	$ 13,977	100.0%
% of Total	26.1%	48.4%	25.5%	100.0%	

Table 3. One company's 5-year cost projections for a move to client/server computing. The real value of the model lies in the story told by the marginal totals. For instance, more than 73% of the cost impacts come after acquisition

Key 3. Include All the Benefits

Usually the easiest IT benefits to find, quantify, and defend, come from cost savings and avoided costs—benefits that appear from a careful application of the cost model to a "business as usual" scenario and to a "proposed action" scenario. These benefits are easier to work with because they are tied more or less directly to various kinds of IT resource usage. The largest business benefits from an IT action, however, often lie elsewhere.

An IT action can yield benefits of several kinds besides cost savings and avoided costs. Table 2 above puts these "other benefits" into three categories:

- Cash inflows
- Tangible but non financial benefits
- Contributions to strategic business objectives

These consequences may be worth many times the favorable cost impacts, yet they are often missing from the IT business case. Why? The reasons for omitting "other benefits" are many, but here are some common concerns:

- The "other" benefits are not benefits to the IT Department.
- These are "soft" benefits. The impact is uncertain and unlikely to turn into real money.
- They are difficult to quantify: who knows what they're really worth?
- These benefits result from many things besides the IT action.

The appropriate range of beneficiaries might extend further than you think.

Sometimes these arguments are legitimate reasons for leaving benefits out of the case and sometimes they are not. Detailed methods and strategies for addressing these issues and for quantifying such benefits are beyond the scope of this white paper,[1] but here are a few general considerations.

First, consider carefully the scope of the case: *whose* costs and *whose* benefits are to be included? This is an issue you must settle with your business case audience or reviewers *before* presenting final results. In any case, the appropriate range of beneficiaries might properly extend further than you initially think. For example:

- In many government IT business cases, the case developer is mandated to consider benefits to society as a whole, as well as cash inflows and outflows to the IT organizations and agencies involved.
- IT actions in a large health care delivery system may have impacts far beyond the IT organization: efficiency and accuracy of billing and record handling may improve throughout the system, professional service delivery may be more timely or better, the range of services may be extended, system-wide operating costs may be reduced, staff professionalism may be enhanced, and so on.

There is no question that IT actions can have beneficiaries beyond IT itself. However, it is the case developer's responsibility to extend the scope of beneficiary coverage appropriately, by agreement with case audience or recipients. The crucial point is that beneficiary scope is not set automatically by defining the subject of the case. Nor does the cost/benefit analysis itself determine where to set the boundaries of coverage.

Second, design the case to fit its purpose. Which benefits belong in the case may depend on the reason the case is built and what use will be made of it.

- The purpose may be, for instance, to support budgeting and planning questions: Can we undertake the upgrade and stay within budget? What would a comprehensive ERP system do for our business plan? What should next year's capital budget look like?

  In such cases, expected cash inflows should certainly be included, but tangible non-financial impacts such as "freed up professional time," which are normally assigned financial value arbitrarily, should not enter the financial summary.

[1] For guidance and practical examples, see *The Business Case Guide* from Solution Matrix Ltd. (for availability information, visit web site www.solutionmatrix.com.)

- If the case purpose is decision support—deciding which alternative is the better business decision—the full range of benefits is usually appropriate.

Never omit a benefit from the business case simply because it is hard to quantify.

Third, we suggest that you never omit a benefit from the business case simply because it is hard to quantify. *Do* omit a benefit if it is unlikely or its probability is unknown. Do omit benefits that are inappropriate for the purpose or scope of the case (see above), or if they are of trivial magnitude. Otherwise, however, finding the "best business decision" depends on having all important benefits in the case. Especially if the IT action contributes to strategic business objectives. You may find a benefit difficult to quantify (See Key 5 below) or impossible to quantify acceptably (see Key 9 below), but if the impact is likely to occur, if it has some tangible effect (can be measured in some objective way), and if it contributes to a business objective, it belongs in the business case.

Key 4. Try to Value Every Important Benefit in Financial Terms

If you assign no financial value to an agreed benefit, that benefit contributes exactly nothing to the financial analysis. Is this really appropriate? Often it is not. The company may invest in technology in order to improve its professional image, improve customer satisfaction, or create a more professional work environment. But how much credit do these benefits deserve in real money? They will contribute 0 to the case financial summary if an acceptable valuation is not agreed.

Consider, for instance, a few strategic objectives at a large commercial bank:

- Increase market share
- Increase revenues
- Move business into more profitable financial services (i.e., change the business model)
- Decrease loan losses

Often, the large strategic benefits fall to criticism and get left out of the business case.

In a large bank, these objectives refer to vary large cash flow streams. If an IT investment improves performance in any, even by just a few percent, the benefits of the IT investment can be massive. A few percent of a very large number is a large number.

Nevertheless, a bank IT director may attempt to cost-justify the investment in terms of cost savings and cost avoidance (displacement of data entry clerks, for instance, or lower expected hiring rates). The latter benefits are smaller but easier to quantify. A good IT business case needs all true benefits of both kinds, but often, the large strategic benefits fall to criticism and get left out. Top-level management may be reluctant to credit IT for reaching strategic business objectives, probably because IT alone may not guarantee the objective.

New network architecture for the bank might help reduce loan losses, or help sell more profitable financial services (perhaps by providing timely access to critical customer data), but it is not the only requirement for reaching these objectives. Reducing loan losses may also require changes in

the way professional staff are trained and managed, or changes in loan decision criteria, for instance, However, if the IT action is *necessary* for reaching the objective, or if it clearly contributes to getting there, IT deserves some of the credit in the business case. That credit will not show up in the case financial summary, unless the contribution is quantified in monetary terms.

If the IT action is necessary for reaching the objective, it deserves some of the credit in the business case.

Not every benefit will be quantifiable to everyone's satisfaction, but there are some well-tested methods that often work to produce an acceptable value. There is not space to cover these methods here but, in a nutshell, many of them are based on strategies for...

- Quantifying the value of the benefit's *effects*. For example, a "more professional work environment" may have a highly quantifiable effect on such things as employee turnover—in terms of recruiting costs, training costs, and productivity.
- Setting the value equal to the cost of *alternative* solutions. For instance, a commercial bank loan officer must have access to customer credit histories and other business and economic data. Technology brings that information to the desk within a few minutes. What is the value of that IT benefit? Consider the cost of the next most cost-effective means of getting the same results.
- Setting the value equal to the cost of *not* providing the benefit.

There are other strategies for quantifying the "unquantifiable" benefits, some using probability assumptions and dynamic modeling (such as Monte Carlo analysis), and other techniques to develop an "Expected value" for the benefit. Use complex or abstract benefit valuation methods cautiously, however, because they may require assumptions or information you cannot provide. Do everything you can to quantify every important benefit, in other words, but include only those that you or your audience cannot accept with confidence.

Key 5. Don't Allocate if You Don't Need to

Cost and benefit *allocation* can cause real headaches for the business case author who sets out to produce a "return on investment" (ROI) estimate for proposed technology. Some ROI figures rest on so much arbitrary allocation in both the "return" and the "investment" that it's hard to argue with the critic who says, "You can make the case come out any way you want to." Some degree of allocation may be unavoidable, but there is good reason to avoid unnecessary arbitrariness whenever possible.

Consider for instance cost allocations *within* IT operations. These occur because few IT actions take place in isolation. IT actions are usually evolutionary changes to the existing infrastructure, not a start from 0. New capacity and new capabilities run alongside existing technology, sharing many of the same resources (human resources, hardware, software, infrastructure, and so on throughout the cost model in Table 2). The first allocation question for many case builders is: What fraction of these resources costs should be allocated to the proposed (or new) technology?

You may or you may not be able to sort out a rational, objective answer using techniques such as activity based costing or some other kind of workflow/task/resource approach. We have found many times, however, that the question is one that does not need asking if we change slightly the way the case subject is defined.

Suppose the proposal on the table is a move to an Enterprise Resource Planning (ERP) software system. The new system will be grafted into the existing IT infrastructure. Even though it displaces some existing applications and activities, it shares resources with other continuing IT functions. If management insists on having, say, an ROI figure for the proposal, then we must produce a "total investment cost" estimate, allocating (arbitrarily) some of the shared resource costs to the new system.

If management can live with a slightly different cast to the business case *subject*, however, the internal IT allocation problem goes away. We can prepare two cost/benefit cash flow scenarios or two business plans for the entire IT operation: Scenario A for IT operations under "Business as Usual," and scenario B for IT operations including the move to the "Proposed ERP System." The net advantage (or disadvantage) of implementing the proposal shows up in the "deltas" or differences between scenarios.

This is not an ROI analysis anymore, strictly speaking [2], but the two financial scenarios in fact provide management with a better basis for decision-making than does a single ROI figure, anyway. This approach still requires a good ability to estimate IT resource needs and their costs under both scenarios, but it does not call for overly arbitrary cost allocation within IT operations.

Key 6. Understand the Difference Between Incremental and Total Value Scenarios

Where does a *cost savings* go in the cash flow summary? Is it a positive inflow appearing under "Benefits"? Or is it simply a reduction in an outflow under "Expenses"? The answers to these questions are related to other issues that sometimes trouble case builders: "Should we enter incremental costs and benefits as case data, or should we use the full, total value of each line item?

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[2] The "investment" side of a proper "return on investment" metric is the sum of costs and assets specifically dedicated to the investment action—hence the need to allocate resources that are shared between the investment action and other operations.

Despite its popularity we do not recommend the use of "ROI" metrics per se in most business situations. The simple ROI concept (incremental return from the investment over cost of the investment) assumes that return and investment are tied to each other but not to other things. Suppose that a $100 bet at the race track brings winnings of $180. The ROI on this "investment" is appropriately figured as (180-100)/100, or 80% because the return is caused directly and only by the investment. The ROI metric is less appropriate in complex business situations, however, where "return" (improved business performance) follows investment after a long time, depending on many things besides the original investment.

Understanding the difference between "incremental" and "total value" scenarios is important from the start of your business case project: the approach you choose may play a role in which data you gather, and it will certainly determine the way you present results. The basic issues in this distinction are easy to explain—which is fortunate, because you may have to explain them to your project team and audience.

Consider the two simple cash flow scenarios shown in Table 4. Each represents a different business case scenario: "Business as Usual" or "Proposal." These are "Total Value" scenarios, in that we estimate the actual total benefit values and actual expense figures under each scenario.

Business as Usual	
Benefits	
Sales.....	$120.00
Expenses	
Maintenance.....	($100.00)
Support.....	($30.00)
Net Result.....	($10.00)

Proposal	
Benefits	
Sales.....	$150.00
Expenses	
Maintenance.....	($110.00)
Support.....	($20.00)
Net Result.....	$20.00

Table 4. Cash flow projections for two business case scenarios. Data represent Total Values of "Benefits" and "Expenses."

Failure to appreciate the difference between total value and incremental approaches is the root cause of much confusion.

Under the total value approach, the author or case owner presents both financial scenarios. The choice of one or the other as the better course of action is based on comparing the total values of each scenario, and the deltas or differences between comparable line items. We can see for instance, that business as usual is losing money right now, whereas the proposal scenario projects a net gain.

The case builder can also lead with a different presentation, however, as shown in Table 5 (next page). This is the "Incremental" approach. The data for each line item are only the proposal changes from business as usual. Notice how "Support" expenses are positioned differently under the two different approaches. Support is an *Expense* or cash outflow on both total value scenarios. We know that support costs are lower under the proposal because we can compare scenarios. Under the incremental approach, however, "Support savings" appear under "Benefits" as a cash inflow.

Many people (including your case audience) may look at Tables 4 and 5 and say "What's the difference?" All that changes between approaches is the way data are formatted. Nevertheless, failure to appreciate this small difference is the root cause of many business case confusions. One confusion of course is the question of what to do with cost savings (Do they go under "Benefits" or "Expenses"?). More pervasive, however, is the problem of mixed data: case builders often err by including total values for

Proposal - Incremental Changes	
Benefits	
Sales increase……	$30.00
Support savings……	$10.00
Expenses	
Maintennace increase…..	($10.00)
Net Change……	$30.00

Table 5. Incremental presentation of the data from Table 4. Data and results represent only the differences between business as usual and proposal scenarios.

some line items and incremental values for others. This mistake is so easy to make that it is always wise to review your own cases or those of others to be sure that all data are one kind or the other.

Which approach is preferred in the IT business case? As usual, that depends on the purpose of the case and some other factors. The total value approach is generally preferred when:

- The case is meant for budgeting or business planning purposes. Here, you need to see the total magnitudes of line item numbers as well as the difference between scenarios.
- There is no viable "business as usual scenario," or there are many different proposal scenarios to compare.
- The "cost" side of the cost/benefit case will go into a "Total Cost of Ownership" analysis of its own.

On the other hand, the incremental approach may be more appropriate when:

- The action scenario is viewed more as an investment decision, and management truly wants to weigh costs and expected returns of the action itself, independent of other financial factors in the environment.
- The incremental costs and returns of the action are small relative to total inflows and outflows.

Key 7. Put your Analysis Into a Long-Term, Time Line View

When presented with an IT business case analysis of any kind—cost/benefit, Total Cost of Ownership, financial justification, or something else—you should look immediately for several key business case elements: a clear statement of case subject and case purpose, the complete cost model for the case, the rationale for valuing benefits (if benefits are included), and a *time line*.

Cash flow projections should be organized around a time line.

For all but the simplest of scenarios, line item data and cash flow projections should be organized around a time line. Figure 1 for instance represents a typical IT investment curve: bar heights show net cash flow results for a number of time periods (months, quarters, or years). The time dimension should also be visible for individual line item inflows or outflows, arranged perhaps in spreadsheet-like columns or tables. The author may know very well when individual inflows and outflows occur, or when the net impact reaches a "break even" point, but the audience and readers also need to see how they occur in time in order to judge the validity of results and to know best how to apply financial tactics during implementation (reduce costs, accelerate gains, postpone costs, or increase gains).

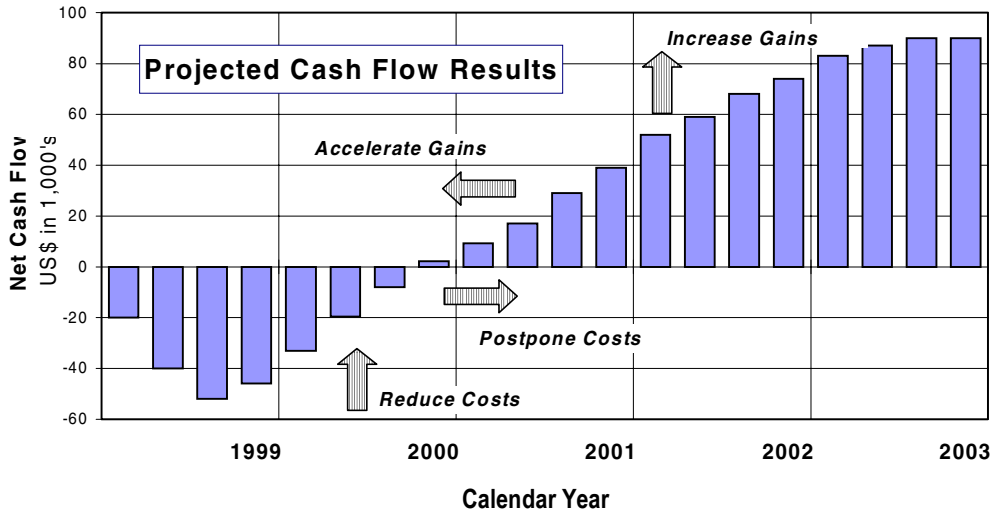

Figure 1. Business case results organized along a time line. Case readers need to see when data and results appear and how they change in time. A time-line view provides a basis for applying financial tactics : reduce costs, postpone costs, accelerate gains, and increase gains.

The business case time line extends throughout the whole analysis period—five years, in the Figure 1 example. How long is an appropriate analysis period? Major IT actions usually have cost and benefit consequences that extend across years, sometimes long after the original hardware and software purchases have been written off and replaced. When an organization chooses a new operating system, or a different database

architecture, for instance, the choice may limit or direct IT planning choices through several cycles of cpu upgrades or software versions, a period of impact that covers several years at least.

Key 8. Keep Individual Risks in View

Business case results are always uncertain to some degree because they project events into the future. They are estimates based on other estimates: IT cost projections for the next several years may derive from estimated capacity growth, estimated transaction volume, and predicted future prices, for instance. Your estimated benefits may reflect expected business performance, market changes, and competitor actions that haven't happened yet and which are controlled by many factors. When you present business case results, *expect* your audience—customer, client, or management—to have questions like these:

- How *likely* are the projected results?
- By how much can they be wrong?
- What are the risks to achieving these results?
- What can we do to maximize the results?

There are simple ways and complex ways to address such questions successfully, but all have this in common: they keep individual risks in view. Risks, unfortunately, are sometimes often lumped together in business case analysis. A common approach is simply to set higher "hurdle" rates or require shorter payback periods for proposals under consideration. If this is done without an eye on the individual risk components, the accuracy of the business case and the ability to control risk suffer.

The details of complex risk management methods such as Monte Carlo simulation are far beyond the scope of this paper. In a nutshell, Monte Carlo asks you to identify the important "input" factors (variables) that impact bottom line results, assign minimum and maximum possible values to each factor, and then describe the likelihood the variable will have different values between its minimum and maximum (in statistical terms, describe the probability density function for the input variable). Monte Carlo's main output is a probability "curve" such as Figure 2 (next page), that let's you make statements like these: "We have a 90% chance of realizing a net gain of at least $2 million. We have a 50% chance of gaining at least $5 million, 10% chance of gaining $7.5 million."

Such statements may be more useful to management than a single "best estimate." If a gain of $2 million is as a "good" result, and there's a 90% chance of achieving it, the decision to go forward may be easy. If the action absolutely must return $5 million or more, than a 50% risk may be *un*acceptable. It is possible to develop this kind of information about overall results only when you know something about individual risk factors.

Should you or your audience believe such results? Like all statistics, of course, the simulation output (the curve in Figure 2) is no better than the input it is based on. However, if you can make plausible assumptions about the possible and likely values of individual risk factors, then the resulting

results curve is a significant contribution to the validity and practical value of your case.

With or without this kind of risk analysis, however, every business case, however, deserves some form of *sensitivity analysis*, even if very minimal—perhaps nothing more than a set of best case/worst case scenarios. Sensitivity analysis asks the question: "Which assumptions or input data are most important in controlling overall case results?"

This is usually easy to create once you have completed your "best estimate" business case, if your case cash flow model is in spreadsheet form. The first step is to find out which cost/benefit line items and which individual assumptions or inputs have the most impact on overall results. Once you

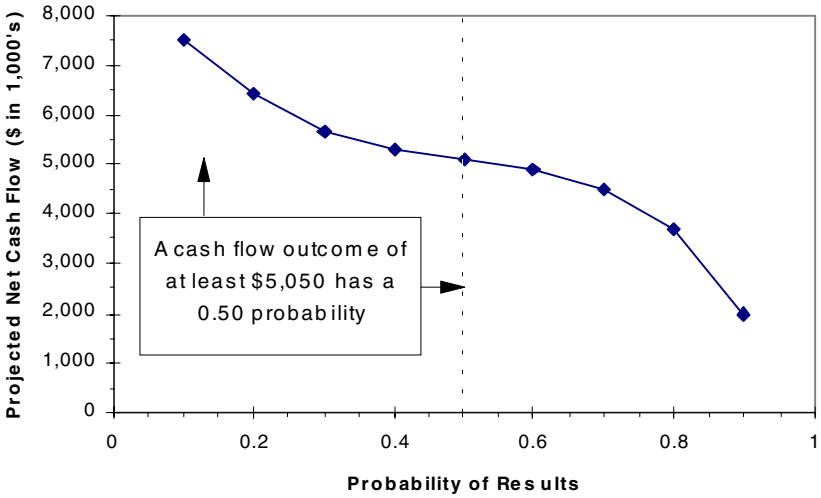

Figure 2. Business case risk analysis output from Monte Carlo simulation. The curve shows the probabilities of achieving different overall results.

know which of these largely control the "bottom line" you can create plausible pessimistic and optimistic combinations of the input factors and test their impact on the case outcome. More sophisticated statistical-based sensitivity analyses will adjust results automatically, recognizing that some of your assumptions are correlated with each other (expected inflation rates, price changes, and salary increases might be an such an example).

When discussing risk and the sensitivity of your results to different assumptions, you can make the business case a more useful management tool by dividing important risk factors or dependencies into two groups:

- Those completely outside your control

  These might include such things as: the rate of inflation, competitor's actions, foreign currency exchange rates, natural disasters, acts of war, or government regulation. These factors need to *watched.*

Management intervention (changes to the implementation plan) may be called for if these change so as to put the predicted results at risk.

- Those which you *can* influence or control to some degree. These might include such things as: skill levels of your professional staff, timely completion of related projects, achieving cost control goals, recruitment and hiring of key individuals, and many others. These factors need to be *managed*.

Key 9. Keep Non-Financial Benefits in View.

No matter how hard you try to put a value on every IT benefit (see Key 4 above), some will probably remain unquantified, at least in financial terms. Such benefits may include improvements in corporate image, customer satisfaction, or employee morale. These may represent major corporate objectives, and reaching them will no doubt translate into lower costs and increased revenues. Nevertheless, you and your audience simply may not be ready to accept monetary estimates for them with confidence. These benefits will not enter the business case financial summary or cash flow statements, but they may still deserve consideration in the proposal.

If you cannot put a financial value on beneficial impacts, should you say anything about them? We recommend answering "yes" if these conditions are met to your satisfaction: The impact…

Non-financial benefits will not enter the financial summary or cash flow statements, but they may still deserve consideration in the proposal.

- Is real (it is likely)
- Contributes to an important business objective.
- Is large enough to matter.

For non-financial benefits that meet these criteria, here are some brief guidelines on how to use them effectively in the IT business case.

- Make the impact tangible.

Describe the benefit, that is, in ways that can be observed and verified, even if not in monetary terms. You may expect a real "improvement in staff professionalism," for instance, but you may not be able to evaluate the value of that in monetary terms. You can, however, describe the likely effects of that benefit in other observable terms, such as lower staff turnover, easier recruiting, less absenteeism, and so on.

- Connect the impact with business objectives and business case results.

Ideally, your business case document should start with an introduction that clearly presents the objectives, opportunities, or problems addressed by the subject of the case.[3] When you identify the non-financial benefits of your proposal, connect them directly to this introductory material, especially in your "Conclusions and Recommendations" section.

[3] For more on what belongs in a business case and why, see the Solution Matrix Ltd. white paper "Business Case Essentials: A Guide to Structure and Content."

- Emphasize the financial or other business value of the objective, even if you cannot assign a known fraction of that value to the benefit.

By taking these steps, you are in simply reminding your readers or audience, in effect, that good business decision making is often more than a simple matter of weighing financial sums.

Key 10. Use Your Analysis for Continuing Management and Control

No matter how well you prepare yourself or your case-building team, your next IT business case will probably not be your best one. The case after that will probably be better—easier to build, easier to understand, and more accurate. Individual and organizational learning are requirements for perfecting the case-building process, and some of that learning has to come from experience.

From repeated trials over time, you will learn how best to refine the cost model and how to assign cost and benefit values to IT actions appropriately for your situation. By consistently using the same approach to business case design, over time, your organization should improve its ability understand and act on case results effectively. Unfortunately, too many people and too many organizations begin each case-building project starting from 0.

One way to learn from experience and establish consistency is to use the case as a financial control tool.

One way to learn from experience—and establish a consistent approach to case design and case methods—is to use the case as a financial control tool throughout the lifetime of its subject. The business case that justified an IT acquisition or action can live on, long after the initial decision, as the heart of a powerful tool for managing the consequences of that decision. Expected cash flow items and other elements can be linked into a dynamic business model for tracking, controlling, and measuring IT costs and benefits. Some specific goals for using the case this way include:

- Validating the structure and content of the cost model (see, for example, Table 2).

  You will want to pay attention to questions like these: Do cost line items in the same cell really change together? Are they really planned together? Are some rows and columns of the model so insignificant that they can be dropped or merged with others? Are there significant cost categories that were omitted from the original model?

- Validate cost

  Where there is a gap between prediction (the business case) and actual results, determine whether the resource itself was estimated poorly (e.g., underestimating the need for disk capacity) or whether the costing of that resource was off the mark (e.g., not anticipating hardware price changes).

- Validate benefits

Pay attention especially to the timing of benefits and their actual arrival. Was everything on line and running as planned? Did productivity "ramp up" as expected?

Of course specific figures will be adjusted as plans turn into history but the underlying framework for evaluating the IT business performance impact should not change much over several years. This makes it possible to accomplish many of the objectives discussed in Keys 1-9, above: keeping individual risks in view, reducing costs, increasing gains, accelerating gains, and tactfully keeping your core team and other managers aware of their joint responsibilities in delivering IT business benefits. And, once a solid IT business case analysis framework is established and known, it becomes much easier for everyone to evaluate and make a decision on the next IT proposal.

Further Information

Solution Matrix White Papers

The following Solution Matrix White papers are available at no charge.

- What's a Business Case? and Other Frequently Asked Questions
- The IT Business Case: Keys to Accuracy and Credibility
- Business Case Essentials: A Guide to Structure and Content

The Business Case Guide

Practical Instruction, as well as templates and worksheets for the business case content presented in the white papers is covered in detail in *The Business Case Guide* (ISBN 1-929500-00-9), available from Solution Matrix Ltd. at web site www.solutionmatrix.com.

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About the Author

Marty J. Schmidt, M.B.A. Ph.D., is founder and President of Solution Matrix Ltd. Since the mid 1980s, he has specialized in developing business case analyses and methodology, focusing primarily on information technology, communications, and financial services industries. He has served as Senior Management Consultant with several major consulting firms. Dr. Schmidt has also published a college textbook on applied statistics and many articles on management topics. He is considered a leading authority and speaker on the subjects of business case analysis, financial justification, and IT investments.

About Solution Matrix Limited

Solution Matrix Ltd. delivers consulting services, training, tools and guides, to help business people apply the methods and concepts presented in this document. Since the mid 1980s, Solution Matrix consultants have delivered successful business case solutions for companies across a wide range of industries and sizes, in North America and Europe. Solution Matrix Ltd. is based in Boston, Massachusetts.

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