Can, May, and Should: An Approach to Project Selection

By J. Bruce Weeks

Every day across the world, thousands of projects are proposed, from small to large to huge. Projects that "improve life," projects that are hurry-up/catch-up, projects that are simply "I want this," and projects that solve problems (or at least we think they do). Some projects have real value, some have perceived value, and others have no value at all; and more than a few are either pipe dreams or actually make things worse.

To some extent, the size of an organization will determine how many projects are proposed in a given time period. The size of the organization will also determine what resources are available in order to winnow the list of projects down to a manageable size. And finally, the organization's size will determine what resources are available to actually do the work of the project.

Many projects are reactionary: something bad happens and we rush to fix it. We are a nation of "right now" problem solvers. We can't wait to get our hands dirty, so we shortcut the project vetting process. Comments such as, "It takes too long; we need results now" or a perceived sense of immediacy drive us to get moving instead of building a strong business case for the project.

Moreover, "75 percent of the companies admitted they didn't have a project selection methodology that assured on-time completion. Forty-eight percent of the projects were initially 'poorly designed,' and 35 percent of Six Sigma Black Belts surveyed said they started out their Six Sigma efforts by receiving project assignments that had 'little chance' of success from the start" (Six Sigma Qualtec, 2006).

Further, the Project Management Institute, in its March 2013 Pulse of the Profession report, *The High Cost of Low Performance*, states, "Fewer than two-thirds of projects meet their goals and business intent . . . and about 17 percent fail outright." The PMI report goes on to say, "Failed projects waste an organization's money: for every $1 billion spent on a failed project, $135 billion is lost forever . . . unrecoverable" (Project Management Institute).

With those kinds of statistics, how can we be certain which of the multitude of projects proposed, suggested, or otherwise thrust upon us are "The Ones" on which we should be working? And more importantly, which ones are the projects on which we should *not* be working?

PMI's report also says that what sets an organization apart from its peers as high performing and successful in its projects lies in three areas: (1) focus on talent management, (2) support of standardized project management, and (3) strategic alignment. It is this last area that is the focus of this article. Using the CAN-MAY-SHOULD approach will help us work on" the right stuff."

Stepping back and looking at project selection from a higher-level viewpoint takes patience. Many organizations do have a process to select projects. But often that process does not take into account the ability to actualize the project. The selection is based solely on a financial return that has been calculated. In fact, financial returns might better serve as a final filter rather than the first filter.

The process of selecting projects to complete really should be treated as a project in itself, a project that has a rolling horizon with an on-going work breakdown structure (see Figure 1). There will be some projects in various stages of the selection process during any given timeframe. So, let's take a look at a staged project selection process that will help us make even better decisions.

The CAN-MAY-SHOULD Approach

Any project—whether it is technical in nature, a process improvement, the building of a structure, or any other endeavor one can choose to do that fits the organization—can be analyzed with the CAN-MAY-SHOULD approach. The philosophy of this approach is quite simple: Just because you CAN do something does not mean you MAY, and it certainly does not mean you SHOULD. If you CAN and you MAY, SHOULD you? Is it smart to do so?

> The very first thing that must be done on all proposed projects is a good definition. Charles Kettering said, "A problem well stated is a problem half solved" (Kettering). Without adequate definition, analysis of the project's costs and benefits is meaningless. It cannot be known what the scope of or possibly even the intentions of the project are. Get details before even beginning.
>
> **Figure 1: Project Definition**

CAN implies the *ability* to do something, what is possible. You can't fly without some type of assistance, usually mechanical. MAY implies *permission* to do something, what is allowed. Are you able to do it legally, ethically, and morally? Is it socially responsible? SHOULD enters a whole new realm of wisdom.

- What is needed and should not be avoided?
- What is required and cannot be avoided?
- What is the responsible thing to do and therefore shall not be avoided?

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(CAN, MAY, AND SHOULD: AN APPROACH TO PROJECT SELECTION, continued from page 1)

CAN Is a First Pass at Project Selection

Here we determine what is possible. A project needs to be technically feasible. An initial review should therefore include feasibility studies of some type that fit your organization. In these analyses, shoot for around 80 percent confidence in the studies and the calculations. That is close enough for the first filter and should take about 20 percent of the effort required for a full-blown, highly detailed analysis (Bunkley, 2008). Save that for the last stage.

Does the proposed project support the goals and objectives of the organization? If the project can't pass this test, the organization shouldn't be doing the project, or the goals and objectives need to be changed. If the goals and objectives need a major overhaul to justify the project, the organization has much bigger issues to resolve than this one project. That is a major project all by itself.

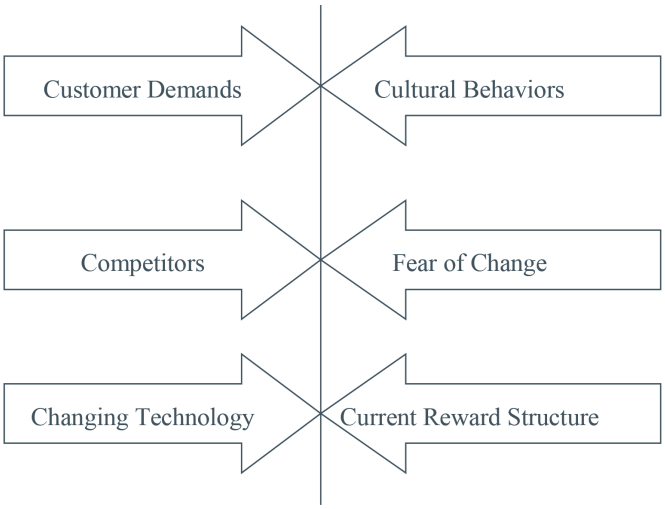

Figure 2: Force Field Analysis Example

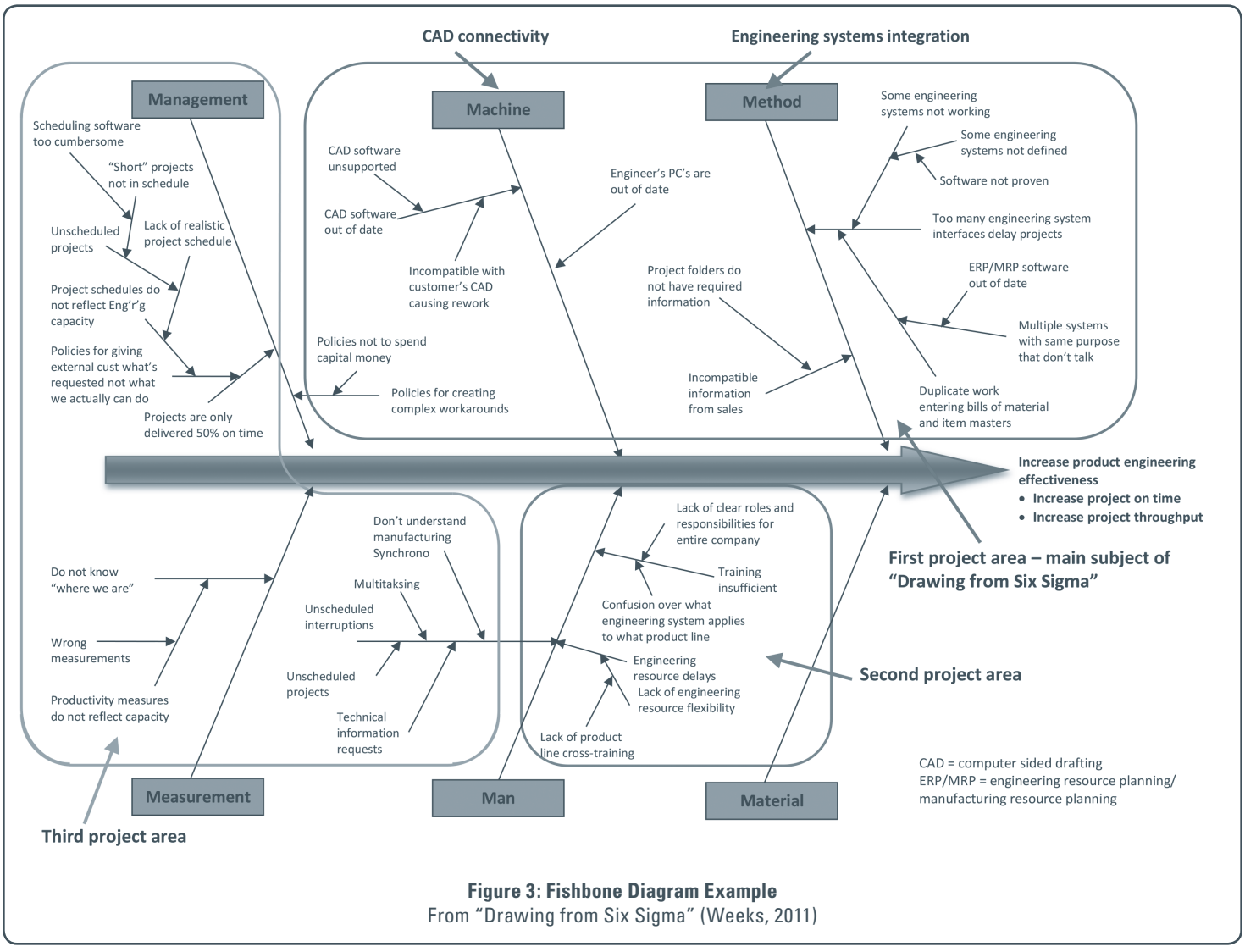

Figure 3: Fishbone Diagram Example
From "Drawing from Six Sigma" (Weeks, 2011)

Here are some tools that may assist decision making at the CAN stage:

1. Force Field Analysis—Balance risk and opportunity (see Figure 2). Use this tool to identify the forces both for and against the project. Can negatives or risks be eliminated or reduced? Can opportunities or strengths be reinforced? Sometimes the bad just outweighs the good, and you have to move on to greener pastures.
2. Cause and Effect/Ishikawa fishbone diagrams can help determine the required inputs. These diagrams are useful not only for problem solving but also can be used for continuous improvement. Think of any project as solving a problem, whether it be adapting to a compliance issue, improving an existing process, or creating a new product. Put that at the head of the fish and brainstorm all the inputs needed to make that statement happen. If you can't make it happen, review the problem statement for adequacy.

   In "Drawing from Six Sigma" (Weeks, 2011), the Ishikawa diagram was used to relate the ideas generated from an intensive brainstorming session concerning the company's need to increase product engineering effectiveness. Ideas were grouped in like categories and then displayed graphically in the fishbone diagram (see Figure 3). Once the data were reviewed in this format, three areas for improvement were noted. The first project area (left side of the red box at the upper right) targeted a 25 percent productivity gain, which was markedly exceeded in a shorter time than estimated.

   As shown in the above-mentioned article, a secondary benefit of the in-depth analysis was identification of another project about revising the entire way engineering systems interacted with each other to effectively reduce project task times and increase engineering throughput an additional 9 percent (right side of the box at the upper right). Since all areas of the company were included in the brainstorming, the effects of the final proposal across the organization were easily elicited. This also insured complete buy-in from the entire organization. For the full details, please review the article on ASQ's Six Sigma Forum Magazine (SSFM) website.

   A second project area that required no capital investment was also identified (box at lower right) and resulted in new definitions for roles and responsibilities. Non-value added work was shifted from product engineering to another group having more resources and a vested interest in the outcomes. The engineering throughput increased another 18.5 percent with this effort. The SSFM article discussed this project as well.

   A third project area that was identified concerns how projects were scheduled, which resulted in a new method of real-time project execution planning that increased on-time delivery from 50 percent to 95 percent (box at left and lower left). This will be the subject of a future article.
3. Tree Diagrams—Process Decision Program Chart (PDPC) or Flow Diagrams (see Figure 4) can help determine what you need to know before a decision can be made. In this way, nothing gets missed with respect to finding all the pitfalls. These diagrams can also help identify sources of project risk and potential mitigations.
4. Supporting Infrastructure Analysis—On this first pass, are there enough resources available from people, money, and time standpoints? Rough calculations on cost of capital, in-source vs. out-source, and whether the collective wisdom of the organization and/or its suppliers/partners will be sufficient to successfully complete the project.

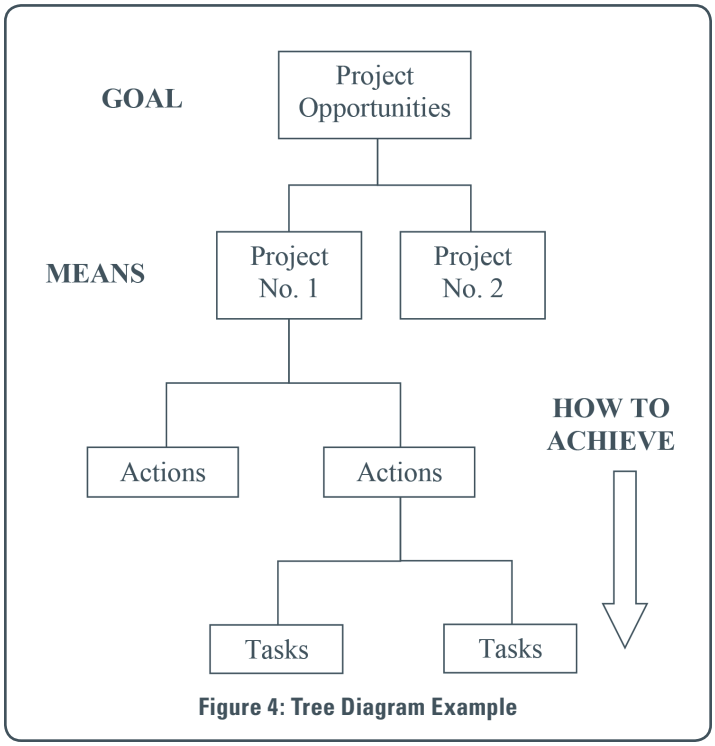

Figure 4: Tree Diagram Example

MAY Implies Permission to Perform the Project

MAY is the stage where it is determined if there are any constraints on the project that could obstruct successful completion. At this point, there may not need to be any further refinement of the project measures. Here is a short list of potential constraints to consider in this stage:

1. Are there any legal, compliance or regulatory constraints? Keep in mind that minimum requirements are often not best practices; just don't try to do less. Sometimes the project is started to comply with a new regulation. Be certain the requirements are clearly understood and keep them in front of the project team at all times to keep their eyes on the prize.
2. Are there any organizational charter restrictions that will not allow certain work to occur? This may be less of a problem for organizations that are for-profit and more an

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issue for not-for-profit institutions. However, the goals and objectives of the organization, regardless of its origin, must be supported by any initiative.

3. What is the effect on the organization's social responsibility? Regardless of allowance by "legal" entities, does the proposed project offer opportunity to enhance brand recognition? Posted in the kitchen of a restaurant where I worked many years ago was this sign: "If you're not proud of it, don't serve it." The same logic holds true here.

4. Consider the voice of stakeholders and shareholders. Not all stakeholders are shareholders, but to be certain, all shareholders are stakeholders. A shareholder is committed to the project and will be held accountable for its outcomes, good or bad. A stakeholder is affected by the project and is involved in advising or perhaps performing some set of tasks within the work breakdown structure. In "Drawing from Six Sigma" (Weeks, 2011)), all stakeholders and shareholders were present during the finalization of the projects. To illustrate the difference between a shareholder and stakeholder, the fable of the chicken and the pig is brought to mind. In a ham-and-egg breakfast, what is the difference between the chicken and the pig? The chicken is involved, but the pig is committed (Pupek).

SHOULD Implies Wisdom in Selecting the Project

The concept of the project funnel is evoked. Now that the determination is made that the project has passed the CAN and MAY filters, some projects will have fallen by the wayside already. The funnel will be tightened further in this stage. More refinement is needed in the cost/benefit estimates, aiming for at least 90 percent accuracy. Additional factors will have become more obvious during the CAN and MAY stages to be included here. For example:

1. Is the voice of the customer (VOC) served? If not, why should this project be approved? The initial project proposal should have contained something regarding the VOC; use it to verify that the latest evolution of the project still answers a real need and provides value to the end customer. If it doesn't, determine why and communicate with the sponsor to seek clarification.

2. Does the project support the goals and objectives of the organization? Again, revisit the decisions made under the CAN and MAY stages. The project may have morphed enough since inception that it no longer resembles the original proposal. Seek additional clarification from the sponsor.

3. In the final analysis, has the voice of all the stakeholders been taken into account? Will employees find the work challenging? Is it worthy employment for them? Think in terms of, "Why would I trade my time for this project if I don't agree with it?" The project must be morally, ethically, and legally sound. "The plundering of the human spirit by the market place is paralleled by the plundering of the earth by capital" (Bookchin, 2004). Social responsibility requires that an organization support its workers by providing meaningful work.

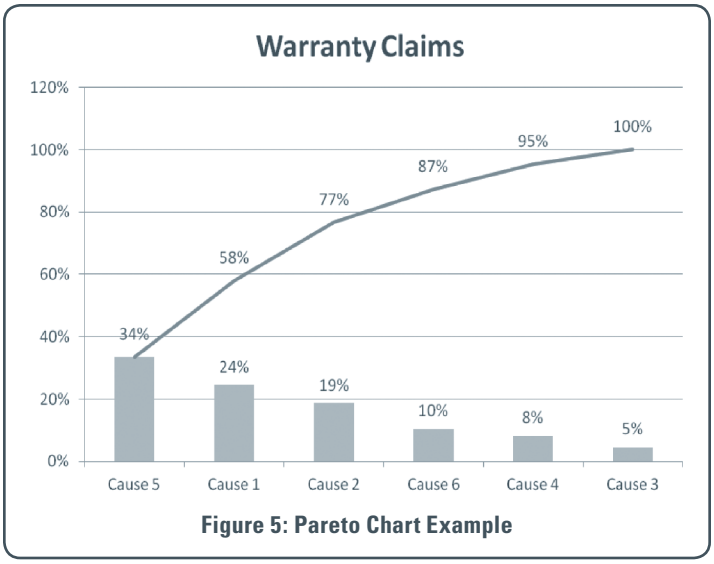

Figure 5: Pareto Chart Example

Here are some tools that might be helpful in further refining the project estimate:

1. Where is the organization in trouble? Well-built Pareto charts can generate a focus for resolution efforts and can be used to assist in sorting the "vital few" from the "trivial many" (Butman, 1997). You must determine what measure should be used to create the Pareto chart. It can be financial, complaints, warranty—there are hundreds if not thousands of ways to parse this out. Use the measure or measures that make sense for the organization's goals and objectives. But don't go overboard and create too many measures, or the effort will be consumed merely collecting and analyzing data. See Figure 5 for an example of a Pareto chart concerning warranty costs.

2. Measures that everyone can understand are financial measures and estimates. These offer a direct comparative measurement method—apples to apples. Peter Drucker said, "There is no conflict between profits and social responsibility" (Drucker, 1975).

   If the organization has done a good job of filtering projects while keeping in mind future costs, this is emphatically true. What is done today creates future obligations that must be included in the project costs. Leaving a legacy of pollution, lost jobs, and lost retirements will immeasurably hurt a brand's image.

   Recall the Enron scandal and how many people suffered from the greed inside that organization (Bratton, 2002). Socially responsible organizations that are in it for the long haul most definitely will need to account for these future costs or risk viability. Some familiar financial measures that could be used in the analysis are:

   - Cost/Benefit analysis
   - Economic modeling

- Net Present Value (NPV)
- Return on Investment (ROI)
- Internal Rate of Return (IRR)

Choose the ones that best fit the organization's brand image, goals, and objectives.

As an example of a financial analysis that helped an organization make a well-informed decision, "Drawing from Six Sigma" (Weeks, 2011) exhibited a well-detailed study showing how much time, and therefore how much money, would be saved by making the change to their computer aided drafting (CAD) systems. Since the brainstorming session that developed the previously mentioned fishbone diagram and the analysis involved representatives from all areas of the company, effects of the project across the organization could easily be developed. This project included a substantial effort from Information Technology (IT) in the form of new computers for the project engineers and a server for document storage. Hence all those costs were included in the calculation of the ROI. The analysis is repeated here in Table 1 and Figure 6.

Table 1: Impact Analysis Estimation of New CAD/CAM Programs
(from Drawing From Six Sigma, ASQ QP Aug 2011)[5]

Estimated CAD impact on NPI tasks per project	Percentage savings	New hours/NPI	Hours saved/NPI
Modeling	35%	3.5	1.9
Drawings	35%	1.5	0.8
Design review documents	50%	0.3	0.3
Tool design	60%	0.4	0.6
Work instruction/process routing	10%	1.2	0.1
Packaging	10%	3.5	0.4
CAD total reduction per NPI			**4.1**
Phase 1 total reduction in yearly project related engineering hours			**1453.1**
CAM savings year one			
Expected programs per year			300
Average hours per program			3.5
Knowledge base impact on all CAM programming			40%
Reduction in engineering hours with new CAM program year one			**420**
CAM savings year two			
Expected programs per year			300
Average hours per program			3.5
Knowledge base impact on all CAM programming			70%
Incremental reduction in engineering hours with Esprit in year two			**315**
CAD/PDM access at plants—increased throughput	**Hours**	**Percentage savings**	**Hours saved**
Reduced PE support to MFG	36	18.5%	6.7
CAD seats for ME to create cutting templates	12	20%	2.4
Reduce ME time on tooling for CNC work	192	20%	38.4
CAD drawings for CNC programs for NPI	312	100%	312
3D modeling is a significant benefit to ME's in communicating with others (tooling)			100
Additional product engineering capacity made available			**459**
Summary of engineering hours saved			
Total of engineering hours available for added throughput—year one			2,332.1
Total of engineering hours available for added throughput—year two			2,227.1

CAD = computer aided design
CAM = computer aided manufacturing
CNC = computer numerical control
NPI = new product introduction
ME = mechanical engineer
MFG = manufacturing

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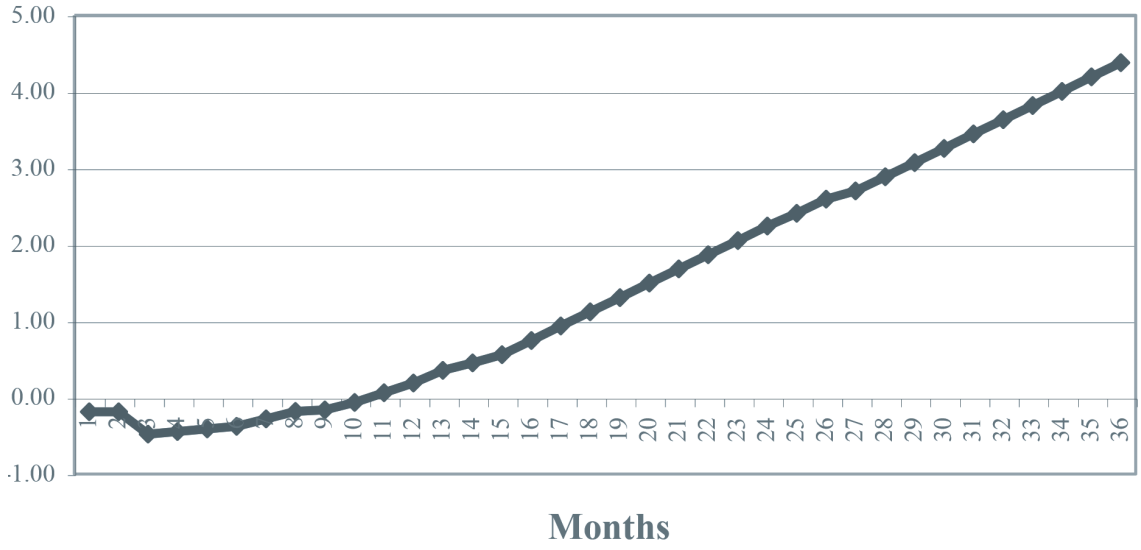

Figure 6: Three-Year Cumulative ROI

As an example of a project that must be done before another can be completed, the organization in the case study "Drawing from Six Sigma" (Weeks, 2011) ran into an issue with one of the assumptions in their original model.

It was assumed that the sales department could easily fill the pipeline to product engineering with design projects regardless of the increase in productivity achieved by the Six Sigma project. However, once the productivity increase exceeded 25 percent from the CAD system changeover, it was found that the assumption was false. The remainder of the project was put on hold until a new project portfolio management system could be built and implemented. This will be the subject of a future article.

Figure 7: What Comes First

3. Interrelationship Digraphs are tools that build on the connections that may exist between projects. Are some projects related to others? Will doing one preclude others? Is there another project that must be done first before the one in question can be even started? See Figure 7.

Using Prioritization Matrices as a Decision Tool

The prioritization matrix can help us choose between multiple options with multiple benefits that are not each of the same value (Westcott, 2006). The procedure is relatively simple but may be labor intensive if the criteria or options to be considered are extensive. However, we can use the matrices to compare a wide array of options.

Start the priorities matrix by dseciding what measureable criteria will be useful in comparing projects. Some examples are:

To "pay-it-forward" in the context of project selection means that not only does the organization directly benefit from the project, but sometimes others outside the organization benefit as well. Leaving a legacy of society being better off from the work of your organization can pay future benefits in the way of good will.

For example: Research has shown that 26 percent of adult consumers take environmental issues into consideration in buying decisions, 78 percent seek out green products, and 31 percent will pay more for "green" products. Green products benefit society as a whole by reduction of the footprint left by the organization through preservation of resources, reduction of carbon consumption and waste products by recycling. Thus green efforts leave something for the next generation as well as add potential profits.

And of course the most perfect examples of the pay-it-forward approach are truly humanitarian organizations such as Red Cross and United Way. These organizations take volunteer efforts and public donations to assist those who need it most.

Figure 8: Pay-it-Forward

- Financial—This can take many forms as previously mentioned: ROI, IRR, NPV. It seems obvious that most organizations place higher value on higher payback. That may not be true for non-profits, however. (See Figure 8 on Pay-It-Forward.)
- Market Placement—What value does the organization place on factors such as market share, market leader/follower.

Table 1: Priorities Matrix Example—Selecting an Alternative Fuel Vehicle

	Dual Fuel Capability	Seats 3 Comfortably	Availability of Refill	Range Between Refills	Row Total	Row %
Dodge RAM 2500 Bi-Fuel CNG/Gasoline	10	1	5	10	26.0	48.7%
Honda Civic Natural Gas	1/10	8	5	8	21.1	39.5%
Fiat 500e Electric	1/10	5	1	1/5	6.3	11.8%
Total					**53.4**	100%

- Regulatory/Compliance—Will the project affect any of these issues, positively or negatively? If so, what value does the organization place on each project's effect?
- SWOT Analyses results—What projects support the organization's strengths or mitigate its weaknesses? Is there an opportunity that supports the organization's goals and objectives? Does this project reduce a threat? And finally, what value does the organization place on each project's effect in these areas?
- Lifecycle costs—A truly socially responsible organization will view the project's ongoing costs as something that must be annuitized today. Which of the projects under consideration either has lower on-going costs or higher "Pay-it-Forward" potential? See Figure 8.

An example Priorities Matrix is included in Table 1 to clarify how this might be used in project selection.

In Summary

Organizations seeking to improve the quality of the projects they undertake can benefit from treating project selection as seriously as they treat the projects themselves. By using the three stages of the CAN-MAY-SHOULD approach, the organization will increase the odds of the project selection process being successful.

- CAN the project be done? As a first look at any new project, does the organization have the resources to be able to successfully complete it?
- MAY the project be done? What obstacles need to be overcome? Is the project not sanctioned by one means or another?
- SHOULD the project be done? Is it the right thing to do? Ultimately, this is the real wisdom in the project selection process.

The CAN-MAY-SHOULD approach also yields all the information necessary to build a strong business case. By thoroughly researching the alternatives, filtering potential projects down step- by-step, and gathering all the estimates and other data, the final selection will become more obvious. It will be the projects that meet the CAN-MAY-SHOULD criteria most completely. The projects selected are then more assured of acceptance and success.

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