

Driving Decisions with Project Management

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Abstract

Decisions are an everyday occurrence in projects; driving the processes to make good decisions falls largely on project management. As the key decision maker, a role we refer to as the KDM, the project manager provides the necessary leadership to enable the project team, its sponsors, and executive steering committee to evaluate facts and make judgments necessary for rational decisions.

Rational decisions are those whose outcomes are consistent with facts and are made in a policy framework applicable to all. Rational decisions have a certain appeal to those governed. Enforcement does not drain non-value-add resources from the project.

Leadership comes in many styles, and leadership applied to decision-making is no different. We describe the styles of leaders in four situations: directing, coaching, supporting, and delegating.

Many tools are available to assist the project team develop the information and supporting data for decision-making. Two popular tools that have practical application are formula-based models and decision trees. Both are useful when there is history to support forecasting and calculation of likely outcomes.

Introduction: If Making a Decision Was Easy

If it were easy to make decisions, we would all do it well. Making decisions well means making “good” decisions; decisions that others would see as wise and thoughtful, decisions that project members can readily follow. Good decisions are decisions with rational outcomes. Rational outcomes are consequences of a consistent process applied to decision-making, as shown in Figure 1, The Decision Process. Rational decisions have a natural appeal to those governed by them. By contrast, decisions that seem disconnected from the facts, seem at variance to established policy, or seem counter to the project strategy are not only not rational, they are not easily enforceable. Decisions like these have the practical effect of being decisions not made at all.

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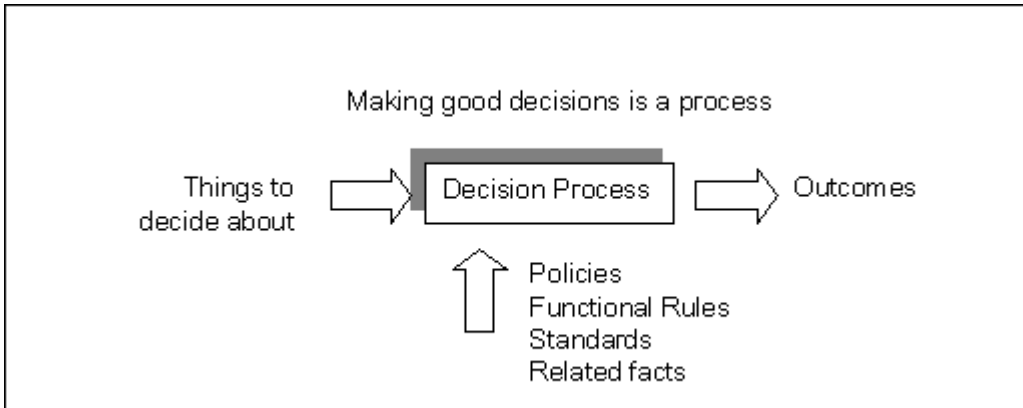


Figure 1 The Decision Process

Bad decisions absorb more project energy than decisions made rationally. Bad decisions almost always cause inefficiencies in the on-going project. Trying to enforce a bad decision takes time and energy away from the tasks that really count.

Good decisions pay immediate benefits. Benefits flow from resources committed and risks managed. Decisions that commit resources and accept risk are often hard to make; deciding a hard decision requires thoughtful evaluation of alternatives. But decided on its merits, a good decision enables project deliverables; and it is in the deliverables that benefits are found.

Good decisions, rational decisions, whether made easily or with difficulty, have a certain dependability about them; they remain decided. Indeed, they usually remain firmly decided.

Discussion: Decision Opportunities in Projects

Everyone who has ever worked on a project has experienced the opportunities to make decisions. They abound. Table 1, Decision Opportunities provides a small sample seen in many projects. We see that there are many key decision makers [KDMs], supporting subject matter experts [SMEs], and other affected parties [OAPs].

Table 1 Decision Opportunities				
Area of Opportunity	Nature of the Decision	Key Decision Maker	Subject Matter Experts	Other Affected Parties

Area of Opportunity	Nature of the Decision	Key Decision Maker	Subject Matter Experts	Other Affected Parties
Project Charter	What strategy and goals of the business are the project to support?	Project Sponsor ²	-Business Unit managers ³ -Customer focus groups	-Project Team -End-users or customers -Lifecycle support team ⁴
Business ⁵ Case	What Key Performance Indicators [KPIs] make up the business case?	Senior Executive	-Project Sponsor -Business Unit Managers	-Internal users -Lifecycle support team
Business Requirements	What requirements are addressable by the project?	Business Unit Manager	-Project Sponsor -Project Manager	Project Team -End-users or customers -Lifecycle support team
Scope Definition	How is the scope to be organized into a Work Breakdown Structure [WBS]?	Project Manager	Project Team	Project Sponsor
Resources	How are resources to be deployed in the project?	Project Manager	Cost Account Managers ⁶	-Work Package Managers -Team Members
Time & Schedule	How is the project phased in time and aligned with the calendar?	Project Manager	Cost Account Managers	-Project Team -Lifecycle support team
Benefits Realization	How are the benefits of the project specified in the business case and expressed in the KPIs to be tracked for achievement?	Project Sponsor	Business Unit Managers	-Project Team -Lifecycle support team

² The project sponsor is the single business executive charged with the success of the project. Typically the project sponsor is not the project manager and does not have day-to-day management responsibility for the project work.

³ Business Unit Managers are the leaders of the organization's units, like sales, marketing, manufacturing, R&D, product service, human resources, training, finance and accounting, treasury, purchasing and receiving, customer support, information technology, and others that may have a stake in the project outcomes. They typically state requirements but not solutions [what, but not how].

⁴ Lifecycle support team refers to those individuals in the business, or contracted to the business, who care for the project deliverables after the project ends and the operational life of the deliverables begin.

⁵ In this paper, the word 'business' stands in place of business, government, schools, churches, hospitals, and all organizations and institutions in general that would do projects

⁶ This paper assumes that the WBS has a hierarchy in which the project is decomposed into cost accounts and the cost accounts are decomposed into work packages. Work packages are the lowest level of the WBS. Cost accounts nearly always have managers; typically work packages have managers or team leaders. Cost account managers report to the project manager in the WBS hierarchy.

From Table 1 notice every decision has a KDM. Someone has to be the decider. Although decision-by-committee or decision-by-consensus is a substitute for an individual KDM, if the committee or consensus never converge on a course of action, someone will have to step up and make the decision. That individual is the KDM.

Discussion: Leadership in Decision-Making

Leadership is a prerequisite to good decision-making. The KDM is the person most charged with exercising leadership at the moment of decision.

Table 2, Leaders in the Decision Process summarizes participants typically evolved with projects in the decision process.

Leader	Leadership Task	What They Decide
Executive Manager	Provide the vision and direction, resources, and incentives. Set the risk tolerance of the organization	What are the goals & strategies, winners and losers among project proposals, and top level resource deployment
Project Sponsor	Act to charter a project to support goal achievement	Who will lead the project and the project plans brought forward by the project manager
Project Manager	Motivate the project team to perform to expectations. See ahead to the decisions necessary to be made by the KDM to meet project objectives	Tactical questions that arise as a consequence of project execution
Key Decision Maker [KDM]	Set expectations for achievement and compliance to task objectives	"The buck stops here". The KDM is the decider, and can be anyone in the process charged with making the decision
Task Managers	Motivate their task teams to perform to expectations	Lower level tactical questions that arise as a consequence of project execution

Leadership Styles that Affect Deciding

Leadership has styles. And those styles affect decision-making in projects. Most leaders have more than one style, though perhaps there is a style that is dominant.

When describing leadership styles, a model is useful. Ken Blanchard and Paul Hersey created perhaps the most familiar and widely known model of leadership styles in the 1960's known as Situational Leadership. In their model, there are four leadership styles, designated:

S1, Directing, wherein the leader defines the tasks of their subordinates and manages the task execution very closely, leaving really no latitude to the subordinate. Obviously, the leader has to have all the knowledge of how to do the task, and correspondingly, the follower is not expected to be a SME.

S2, Coaching, in which the leader modifies their S1 style to allow for some input from the subordinate and some latitude for self-direction. S2 requires some two-way communication that is largely missing in the S1 relationship

S3, Supporting, which further widens the latitude of maneuver and control of the follower. The overall task or task objective comes top-down in true S1 style, but implementation details are largely left to the subordinate.

S4, Delegating, which is almost a role-reversal from S1. The leader recognizes the expertise of the subordinate. The leader likely possesses little or no operational knowledge, and beyond a very strategic level of participative deciding, leaves everything else to the subordinate.

Leaders lead followers. Good leaders apply leadership style according to the situation with their followers. In Hersey and Blanchard's model, followers have four 'development' levels that describe commitment and competence. D4 is high commitment and high competence. There are three other combinations of high and low commitment and competence. D1 is low commitment and low competence.

Leadership styles align with the development levels. For example, a S1 directing style is appropriate when the follower is at D1, low commitment and competence level.

Applying Styles to the Process of Making Decisions

Knowledgeable, confident leaders are likely to be S1, S2 or S3 in their decision-making style. They expect all disagreement to be voiced before the decision is made; they expect and demand obedience to the decision once made.

At the other end of the spectrum is the S4 style. Leaders with S4 style pretty much delegate the KDM role de facto to followers. Leading with the S4 style may require developing consensus among followers, and S4-style leaders may find it hard to enforce delegated decisions. Decisions made by delegation may become irrelevant if the project or business conditions change and followers change direction also.

Deciding Not to Decide

A variant of the S4 style is 'deciding not to decide'. The leader decides for his or her own purposes to 'let the best person win'. Sometimes not deciding is effective for revealing hidden factors that only come to light with the competitive activity that ensues. In effect, this approach usually surfaces the most passionate or most committed

follower. But followers consume much energy in a non-value effort to win the competition.

Table 3, Leadership Styles applied to Decision-Making summarizes the style impacts on the project.

Table 3 Leadership Styles applied to Decision-Making		
KDM Style	When is it applied?	Impact on Followers
S1 Directing	When the KDM is supremely confident or in command of all the knowledge	Subordinates have a clear mandate to follow. They apply their energy toward implementing the decision. However, they may feel that their input or opinion was not heard or not sought Too much application of S1 is micro-management. Subordinates are given little operational latitude. The leader makes most decisions.
S2 Coaching	When the KDM is willing to hear some input about the decision and has some confidence in subordinates	Subordinates have a clear mandate to follow, but they are more comfortable with the outcome because their input was considered
S3 Supporting	When the KDM actively seeks input from subordinates but clearly retains the decision-making responsibility	Subordinates feel empowered that their input has a material impact on the decision.
S4 Delegating	When the KDM has little knowledge or experience in the matter being decided and has confidence in subordinates to make the decision, or to be the de facto decision maker	If a clear leader emerges among subordinates who endorse the decision outcome, the decision may be viewed as a mandate. But if no clear leader emerges, or if subordinates disagree with the decision outcome, then the decision outcome may well be of little practical value.

Discussion: Decisions with Facts, Estimates, and Judgments

In business generally and in projects specifically, managers seek facts to guide decision-making. Facts fit with projects very well. Facts are certainties that have been observed or measured, or provided in rules, standards, regulations, statutes, and other governing documents. Within narrow bounds, facts need little interpretation. They are what they seem to be.

Not all decisions can be fact-based. In some cases the facts are missing or not possible to gather. Other times a decision calls for a judgment or an estimate not grounded objectively. Project managers making decisions without facts have these tools to work with:

- a. Experience with similar situations. Managers look back to their experiences and try to adjust for the present situation.
- b. Experience with the people involved even if there is no experience with the situation. Managers make judgments about how people will respond to a situation or assignment.
- c. Input from an outsider who evaluates results. In effect, answer the question: how will the decision play on 'main street' if evaluated by an objective observer?

Decisions Based on Facts

Fact-based decision-making is often favored, if only because fact-based decisions are rational. Facts are very useful when there is a model to apply them to. Most models are formula driven, providing results that are repeatable and consequential. That is, the output is a predictable consequence of the process, its inputs, and its controlling parameters.

Perhaps no better example of a fact-based decision model is earned value analysis. As applied during project execution, the project manager is often asked to decide whether or not there are adequate resources to finish the project. The project manager seeks two estimates based upon facts: the estimate-at-completion [EAC] and the estimate-to-completion [ETC]. To determine the two estimates, the following information is needed:

- a. The actual expenditures to-date. These facts are the project experience. They take into account all the project factors such as staff experience and availability, clarity of scope, adequacy of tools, leadership effectiveness, and many others.
- b. A measure of the efficiency of the expenditures to-date. Efficiency is also a fact. Efficiency is defined as the actual expenditure normalized by the planned expenditure. Efficiency is a comparison of the quality of planning with the reality of the project experience.
- c. The remaining work to be done and the planned expenditure, or earnable value, for that work. We adjust the planned expenditure by the efficiency of past performance.

The formulas for EAC and ETC simply use the data described above to forecast the future. The forecast is an extension of history. The data needed by the project manager to make a decision about the adequacy of resources for future expenditures is an outcome of the model process.

But can we always base our decisions on the premise that the future will repeat the past?

Let's continue with the example of the project manager who must decide if there are sufficient resources to finish the project. There is another approach to estimating EAC and ETC. It depends on root-cause analysis, mitigations to correct past faults, and a new estimate of the remaining work. It is likely that this different approach will give a different answer than the earned value formula-based approach.

Here are the two approaches side by side:

- a. The earned value formula approach: facts are applied to earned value formulas to forecast the outcomes. In effect, this is trend-line forecasting; the future is forecast by extending past performance to the end of the project
- b. The root-cause and re-estimate approach: Earned value is not used to forecast the EAC and ETC. Instead, root-cause analysis is applied to past performance. Factors contributing to poor past performance are corrected. New bottoms-up⁷ estimates are made of the ETC. The estimates developed by each approach will not likely be the same.

Although deciding among the calculations for the ETC and EAC appears on the surface to be fact based, there is now a judgment to be made. Which ETC and EAC is to be believed and budgeted? The difference between them represents a risk or uncertainty. The project manager is charged with the responsibility to deal with this risk.

The Consequences of Estimates and Judgments

All decision tasks require a considering a certain amount of risk and all require applying a certain amount of judgment, if for no other reason than decisions have consequences. Therefore, evaluating the risks and the consequences assists in making estimates and judgments.

In making a decision there are two ways to look at the impact of consequences.

- a. The false positive or the false negative. This concept comes from hypothesis testing in which we hypothesize that one thing is true when in fact it is not, and therefore something else is true.

Usually, the “cost” of making a mistake is not equal between the two hypotheses. Sometimes a false positive is much more consequential. Other times it could be the other way around: the false negative could be the most consequential. The

⁷ Bottoms-up refers to an estimating procedure whereby all the remaining work on the WBS is estimated beginning with the lowest level of the WBS, the work package, and then adding up all the estimates from the lowest level to the highest level to obtain the total. In contrast, a top-down estimate begins with the total and allocates the available resources to all the cost accounts and work packages. Usually, the former is larger than the latter, creating a risk between the two estimates.

important point is that rare is the case when they are equal. The decider will err on the side of least overall costs, seeking at all times to maximize an advantage for the project at large.

- b. The successor reaction. Evaluating the successor reaction means playing the game a step or two ahead. Put yourself in the successor spot as the respondent to the decision. What will you do? What are the unintended consequences? What are the behaviors that are likely to be set-off?

Discussion: Decision Policy for Deciding

In Figure 1, we illustrate the decision-making process for rational decisions. One of the control elements is a decision policy.⁸ Simply stated, a decision policy is a set of managerial rules that regulate the boundaries of decision-making and assist the KDM in choosing among alternative outcomes.

There is no standard for a decision policy. In many, perhaps most businesses, it is not formally written down in a policy manual. However, there are often are a collection of formal policies having to do with investment sources and amounts, risk hurdles, ROI, EVA, or NPV⁹ measures, ethical practices, make-buy criteria, competitive bidding, minority and small business subcontracting, and other factors that collectively amount to a de facto decision policy.

Decision Policy Elements

A decision policy can have many elements or component parts. Most elements are in the form of a governance statement or directive designed to contain the decision within certain boundaries. Presumably, the project manager or KDM can act as the decider so long as the decision is within the policy boundaries prescribed for the KDM.

Table 4, Decision Policy Elements shows the major policy components that are ordinarily included.

Table 4 Decision Policy Elements	
Policy Element	Purpose and Implementation
Objective	Statement of business purpose served by the policy, behavior to be controlled or regulated, historical motivations for having a policy, and intended result as a consequence of compliance

⁸ The author first described decision policy in his book *Managing Projects for Value* and subsequently expanded the ideas in his book *Quantitative Methods in Project Management*. The material in this section is taken from those original works.

⁹ Risk hurdles, NPV [Net Present Value], ROI [Return On Investment], and EVA [Economic Value Add] are measures of financial risk. Risk hurdle is also known as IRR, Internal Rate of Return. These measures are set up as go/no-go thresholds for deciding whether or not a project is financially risk averse for the business.

Table 4 Decision Policy Elements	
Policy Element	Purpose and Implementation
Governance	Who is governed by the policy, who are the governors, and what is the pathway for escalation of out-of-policy decisions
Directives	Policy substance, stating the policy implementation and steps towards compliance
Effectiveness	Provides the dated beginning and end of the policy, and provides the traceability for any modifications and updates
Owner	Specifies the KDM for making changes to the policy and the KDM that rules over the content of the policy. Often times the owner is an organization, such as Information Technology, and the organization chief is often the signature on the policy

Discussion: Utility Concept In Decision Making

When the project manager begins to apply the decision policy to the project situation, the risk attitudes of the decision makers need to be taken into account. We characterize risk attitudes as being risk-neutral or risk-averse.

If the decision maker is risk-neutral, then the decisions will be based on the risk-adjusted estimates in linear fashion. That is, a dollar of upside potential is just as valuable as a dollar of downside consequence.

As an example of a neutral risk attitude, let us say that a project cost is estimated to have an expected value of 10,000 hours of effort. Expected value is a risk-adjusted average of the possible outcomes.

By analysis, the worst-case outcome on the downside is estimated to be 25,000 hours. Also by analysis, the assessments show there is an opportunity to achieve an upside opportunity that would reduce the cost to only 8,000 hours. If the KDM is risk-neutral, he or she will take the estimates at face value. We call this data “objective”. Objective data has not been influenced by the risk attitude of the decider. The 25,000-hour downside is to be avoided if possible, but it is affordable. The project is not disapproved on account of the downside threat.

The KDM is not disproportionately enthusiastic about the 8,000-hour opportunity on the upside. The project manager will certainly try to obtain this cost, but it is not the reason the project will be approved.

However, decisions are rarely risk neutral if the amount at stake is material to the well being of the organization. Risk-averse decision-making takes into account the absolute affordability of an opportunity.

This concept is embodied in the idea of “utility”. Utility simply means that the decision-maker’s view of risk is either discounted or amplified compared to the objective risk neutral view. Figure 2, Utility Function, shows this concept.

In our example, if the organization or the KDM were not risk averse, then a utility curve or function would be applied to the estimates. Perhaps the expected value would not change because the objective value and the utility value are the same at that point on the curves. However, the utility curve might amplify the 25,000-hour downside as though it were a downside figure like 40,000-hours. And the utility curve might discount the upside opportunity to only 9,000-hours instead of 8,000-hours. If utility-adjusted 40,000-hours is unaffordable, the project will be disapproved.

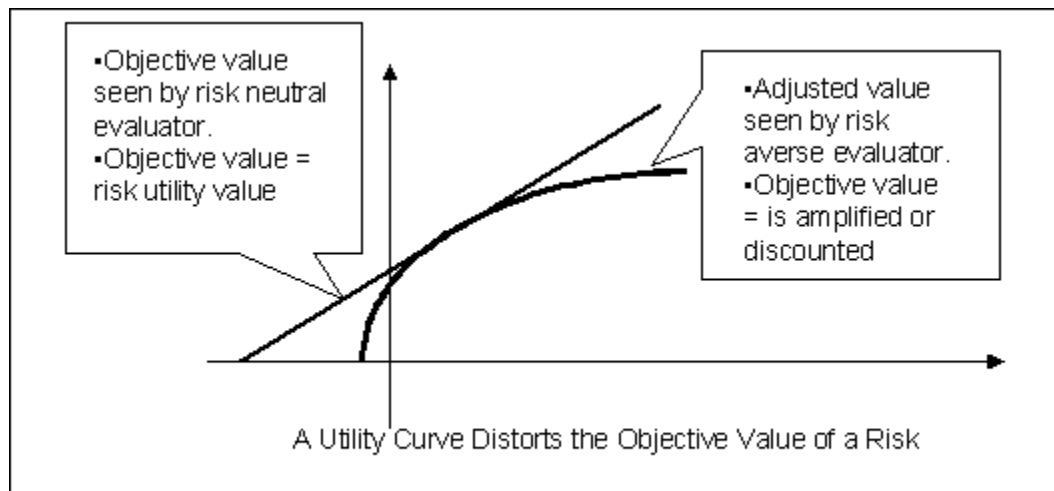


Figure 2 Utility Functions

Discussion: Steering Committees and Executive Teams for Decision-Making

Most large projects involve an executive committee of some type, typically called a steering committee, executive team, or executive committee. The job of these committees in the project situation is governance. They are usually charged with top-level decision-making, often tie breaking, when business managers at lower levels cannot agree or the decision policy mandates governance at the steering committee level.

It is not uncommon that these committees have a staff and a facilitator to prepare materials for decision-making, and to keep the decision process on track and efficient.

Creating an Abstraction for the Steering Committee

Abstraction means hiding detail without changing the meaning of the summary. It also goes by the name ‘headlining’. The purpose of the abstract is to achieve an accurate understanding by executives not steeped in project management.

Signoffs without Signatures

In this era of electronic documents, automated workflow, and electronic conferencing remote distances, the routinely accepted idea that KDMs must literally sign a decision document becomes a bit problematic. In many businesses, the paper document has all but disappeared.

Nonetheless, a lack of paper does not obviate the need for a sign-off, does not put aside the need for approved decisions.

There are solutions to this conundrum: we need a signature, but there is nothing to sign

- a. Minutes of a meeting which is designated as a decision-meeting can be written and distributed by email or other electronic means
- b. Lieutenants can be appointed to review all the detail and provide a go/no-go decision to the KDM. This is the traditional idea of ‘staffing the decision’
- c. Logs, with dates and decision maker inputs, can be kept in various database tools, like spreadsheets, which capture the decision making
- d. Charter documents can be signed if they are reasonable short, like a few pages, in keeping with the ‘paperless’ culture we are evolving to

Discussion: Tools for Decision Makers

Tools help decision makers analyze facts and suppositions. Decision analysis is a critical part of most decision processes applied to projects. John Schuyler, a renowned decision analyst, has written: “decision analysis ...is the discipline for helping decision makers choose wisely under conditions of uncertainty.”

One of the most common decision analysis tools is the decision tree. Decision trees are very applicable to discrete decision problems where there are a finite number of alternatives, and each alternative has a discrete set of parameters.

The Decision Tree

At the root of the decision tree is the question to be decided. Extending out from the root is the branch structure representing various paths from the root [decision] to the choices. For those familiar with the “fishbone” diagram, more formally called the Isakawa

diagram, the decision tree will look very familiar. Along the pathways or branches of the decision tree are quantitative values that are summed along the way at summing nodes.

The Basic Tree For Projects

It is customary to show the tree laying on its side with the root to the left and the branches to the right, as shown in Figure 3, Decision Tree. The decision maker is trying to decide between alternatives, for instance between “A” or “B”. Some of the branches have the “A” values and some have the “B” values. Summing nodes add the values of the branches.

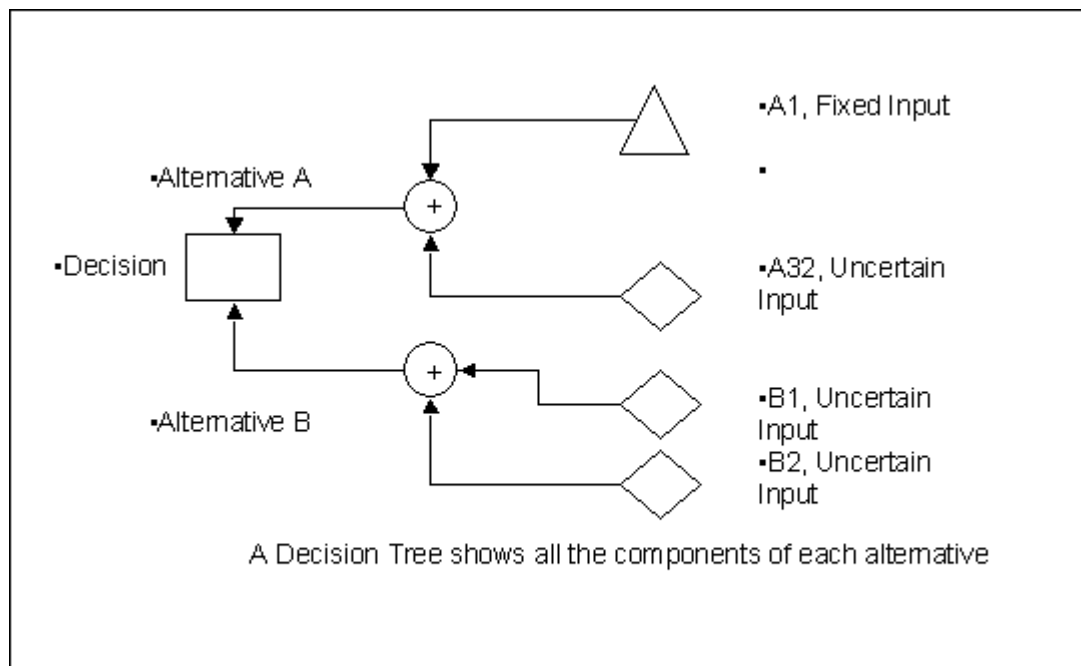


Figure 3 Decision Tree

The project manager makes a decision between “A” and “B” according to which provides the best advantage to the project. Decision analysts apply values to the tree branches in the following way:

- Fixed deterministic values, whether positive or negative, are usually shown on the connectors between summing nodes, or as stand-alone inputs to a summing node.
- Uncertain values are assigned a value and a probability, one such value-probability pair on a connector into the summing node. The summing node then sums the expected value [value x probability] for all its inputs.

The risk tolerance of the business is represented by the way the probabilities and values are assigned to the tree branches. The upside advantages and the downside risk are calculated by simply taking the most optimistic and pessimistic values, one at a time, and calculating the value of each alternative. If the most pessimistic outcomes are not within the risk tolerance of the business, and if there is not a satisfactory plan for mitigating the risks to a tolerable level, then the project may not be approved.

Summary and Conclusions

We end with the beginning in mind: good decisions are driven leaders who abide process and policy, and who consistently apply thoughtful consideration of benefits and risks.

We know that leaders adjust their styles to take advantage of, or compensate for, the capabilities and knowledge of their followers. In some cases the KDM must direct the decision-making with S1 confidence; other times, with other styles, even “deciding not to decide” is a decision. We know that these leaders understand how important it is to avoid the drain of wasteful energy consumed by trying to execute a bad decision.

Good tools make the job easier: the decision tree is one such tool easily applied when there are discreet values and probabilities for the constituents of each alternative. Models are another good tool, capable of developing the data and information necessary for a decision.

In the end, there is a decider. We call that person the Key Decision Maker. KDMs are present in every decision opportunity, even when the decision is made by consensus. KDMs are the drivers of decision-making.