Intaver Institute Inc.
303, 6707, Elbow Drive S.W.
Calgary, AB, T2V0E5, Canada
tel: +1(403)692-2252
fax: +1(403)259-4533
sales@intaver.com
www.intaver.com

Evaluating Project Decisions

Now that you have completed your project, you have reached the point where you need to review and understand any lessons learned from your experiences. When you perform your project evaluation, there are a few major questions that need to be addressed:

- Which choices were correct and incorrect and what are the reasons?
- Did you correctly identify risks and assign their probabilities and outcomes; what about your risk responses, did you plan them properly?
- How do the results of your quantitative analysis compare with the actual data? If they are different, why?

This is one of the most important steps in the decision analysis process, **because it will improve decision-making in the future**. Most organizations perform these assessments either formally or informally where they do a post- mortem review of the project.

Unfortunately, not many organizations analyze how they selected their project plan from among the alternatives and determined the probabilities of the risk events. Moreover, few organizations have mechanisms in place to store this information where it can be easily retrieved. Often, the only record of this analysis is stored in the memories of the participants. Given normal staff turnover and the vagaries of human memories, this is a high-risk strategy in itself.

Before we explain how to set up a post-project evaluation process in your organization, let's examine a number of psychological biases related to project evaluations.

How could we not to foresee it?

Well before Hurricane Katrina struck New Orleans in August, 2005, there were many predictions of how a hurricane would wreak disaster on the city (Wilson, 2001; Fischetti, 2001;

Mooney, 2005). In 2001, the Houston Chronicle published a story that predicted that if a severe hurricane struck New Orleans, it "would strand 250,000 people or more, and probably kill one of 10 left behind as the city drowned under 20 feet of water. Thousands of refugees could land in Houston." (Berger, 2001).

Much of New Orleans sits below sea level and to protect the city from the risk of flooding, the city is defended by an extensive levee system. Parts of the levee system are quite old; construction of the levees began soon after the city was founded. There were concerns regarding the ability of this aging system to withstand the stress that a hurricane would impose upon it. Within two days following Hurricane Katrina's landfall in August 2005, the levees failed in several places. Floodwater from Lake Ponchartrain inundated the city and caused many deaths and billions of dollars in damage.

In the aftermath of Hurricane Katrina, investigations have demonstrated that the levee failures were not caused by natural forces that exceeded the intended design strength. The problem was with the design of the structure, in addition to poor maintenance practices that exacerbated the condition of the levees. It is important to mention that the mechanism of potential levee failure was known long before Hurricane Katrina struck.

The question is, if there were so many warnings about potential problems with levees and risk of hurricanes, why weren't more resources invested to improve the levee system? Now, after the event, these warnings are considered not to be probabilities, but absolute certainties. As we have already learned from many examples, people usually have difficulty judging about probabilities and outcomes, especially when event has not yet occurred. Before hurricane Katrina, federal, state, and municipal governments, and other organizations and interested parties did not believe that major levee system improvements were a main priority. This was due to an underestimation of the probability of the event, even though a number of experts have warned about the risk. Because the cost of protection against such an extreme event must be juggled with other public priorities, only a limited amount of work to improve the levees was done (Hardwerk, 2005).

This phenomenon occurs not only in major calamities, but in project failures as well. Often, as we look back at a failed project, we just cannot understand how we did not foresee a catastrophic event when we were given so many warnings. What caused us to ignore these warnings?

In reality, we are experiencing one of the most common psychological phenomena that occur during the evaluation of the results of project decision analysis: **<u>after the event, we tend to believe that project failures were more readily foreseeable than was in fact the case</u>**.

In most projects, there is a chance of failure or a major risk event that can significantly affect the project. However, if the probability of these failures or risk events is considered to be small, the project will proceed with risk mitigation in place. Risk mitigation does not mean that risk will be completely removed, just that the probability of the risk occurring and the potential impact will be reduced. But let's assume that an event occurred and caused major problems. In the aftermath of this event, management will believe that the wrong decision was made. But this

is not necessarily true, the decision could have been correct as long as decision analysis was performed using the most comprehensive information available at the time.

Situations are much more difficult when an unpredicted risk event occurs. Generally, the reason that these events are not foreseen is due to the use of incomplete or imperfect data to perform the analysis. However, once an event has occurred, it is impossible to erase any knowledge of the event and reconstruct what mental processes occurred prior to the event.

During the decision process, a lot of irrelevant information must be sorted through. (Wohlstetter, 1962). Do you recall the movie "Tora, Tora, Tora" which dramatized the events leading up to and during the Japanese attack on Pearl Harbor? At the start of the move, several scenes describe the "warnings" about an impending attack that the military and political leaders received and the chain of events that led them to underestimating or disregarding the threat. After watching this movie, you might wonder how all of these people missed so many obvious signs of an impending attack and how could so many get it so wrong? In reality, there was a huge number of other irrelevant events that also occurred at the time that were not shown in the movie. Given that we all have 20/20 hindsight, it always becomes clear to us after the fact which information is relevant and which is not. It is because of this phenomenon, after a risk event occurs management tends to believe that it should have been easy to foresee the risk and make the correct decision.

I knew it all along

Did the decision analysis process help us make better decisions for this particular project? How much more did we learn from the analysis than we already knew? These are very common questions raised by the management who approved the decisions.

"I knew It All Along", referred to in psychology as the **<u>Hindsight bias</u>**, is a very common psychological bias. **<u>Management usually underestimates how much they learned from the decision analysis process</u>** and, as a result, management tends to undervalue the decision analysis process. Why bother with decision analysis if we already know the answer.

At the project initialization phase, you presented a risk management plan to your manager. One of the risks was a major delay in the delivery of a component. Based on the analysis, you believed it was a critical risk, and in response, you created a mitigation plan for this risk: purchase the component from another vendor. Your manager was not so sure, but agreed to include it in the project plan. Sure enough, this risk event occurs. Fortunately for the project, you have lined up another vendor in advance, and the project is completed as planned. Now when you have your project review, your manager is now absolutely sure that the component delivery risk was critical before the project started. He goes further to question the value of your quantitative analysis, as this was something that he always intuitively knew. And next time the manager may not give you an opportunity to do another analysis.

Often, once an event occurs, people, not just decision-makers, tend to exaggerate how much probability they lent to the event occurring. Before the event occurred, they might have

thought the probability was15%, but afterwards they will probably confess that they were 99% sure that the event would occur.

Overestimating the Accuracy of Past Judgments

Project managers or analysts tend to overestimate the accuracy of past judgments. This is one type of the **Overconfidence bias**.

Here is a small psychological experiment you can perform in your organization. Ask a project manager to recreate from memory a risk list or risk breakdown structure he or she defined during a project initialization phase about a year ago. Now compare it with the original risk list. You will most likely find that in the new list the probability for risks that actually occurred are much higher than they were in the original list.

The knowledge of outcomes affects our memory of previous analyses. When an analyst knows the outcome, he or she will believe that they properly identify the event and assigned the correct probability. The more time that has passed since the original decision analysis was conducted, the greater is effect of this bias.

Peak-End Rule

Peak-End Rule is a heuristic in which we judge our past experiences almost entirely on how they were at their peak (pleasant or unpleasant) and how they ended (Kahneman, 1999). Other information appears to be discarded, including net pleasantness or unpleasantness and how long the experience lasted. This heuristic affects project reviews and evaluations: project stakeholders may not remember all the necessary project details. You may remember a product launch (final stage of the project) and highlight of the project (CEO visit and subsequent dinner in a good restaurant). You probably don't remember why, how, and by whom certain choices were made.

"A Guide to the Project Management Body of Knowledge" (PMBOK) (Project Management Institute, 2009) recommends identifying lessons learned **at any point** of the project. In other words, it recommends that you collect and record information about all major project decisions and events at all stages of the project. It helps to mitigate memory errors associated with the Peak-End Rule.

Decision Evaluation Process

Actual project evaluations are usually performed as part of other business processes. The PMBOK recommends creating an "Organizational corporate knowledge base" which should include "historical information and lessons learned knowledge base". This information is collected during project execution. The Closing Project process includes the Updates of Organizational Process Assets procedure where "Historical information and lessons learned information are transferred to the **lessons learned knowledge base** for use by future projects". In practical terms, this means that the results of project evaluations should be saved in an organization's knowledge base, so it can be referenced when planning future projects.

In software development processes, such as Rational Unified Process (RUP) (Kruchten, 2000), evaluations help to determine whether the established goal was achieved. Such evaluations include people, processes, and tools and can be performed after each project iteration.

Here is what is required to assess project decision-making:

1. Assess input information which was created at the project planning stage:
   - Project schedules;
   - Risk management plans including risk breakdown structures with assigned probabilities of certain events;
   - Strategy tables with list of alternatives; and,
   - Results of quantitative analysis.

2. Compare input information with actual data:
   - Was the selected alternative correct;
   - Which events occurred, which did not; and,
   - Were duration and cost estimates accurate?

3. Briefly document the conclusions and store it in a corporate knowledge base

Corporate Knowledge Base

We discussed the importance of an organizational knowledge base where historical information about decisions, as well as lessons learned would reside. But how would this knowledge base work in reality?

In one engineering company, we met with a very interesting person. He was about 75 years old and had worked his entire life in the same organization. He probably had been working there for 50 years. He had served in many different positions: fresh out of university he initially had a position as a junior engineer and eventually became head of his department. For the last 20 years, he has worked as a full-time internal consultant to the various divisions in the company. Primarily, he was valued as the corporate "knowledge base". Although his was not able to generate new engineering ideas, his long-term memory was excellent. He analyzed each project to see if there were any historical precedents that could be applicable to their new projects. He looked to see if somebody had been faced with similar issues and what were the results of their decisions. By doing this, he was able to make some fairly accurate judgments about the actual probability of certain events.

While our human knowledge base seemed to be working fine for this organization, human expertise always has some limitations. First of all, it is hard to find a person or a group of people who remember and understand all relevant previous projects. Secondly, everybody has cognitive and motivational biases, which can affect our judgment about previous decisions.

There are a number of computerized tools, which can help to establish a company's knowledge base. Some of them are specifically designed for organizational knowledge bases and many portfolio management software products have document management functionalities.

Not all companies have corporate portfolio management software and not all companies would store documents related to decision analysis there. Here is a simple and effective way to establish corporate knowledge base: save all your documents on a corporate Intranet in such way that can be searched using search tools like Google. These tools can be used effectively in internal sites where you can search your internal archives. Just make sure you use proper keywords for your documents so that the search tool can return the most relevant documents.

Summary

- Evaluation of project decisions is a very important step in the process as it will improve future decision-making.

- After an event, management will believe that project failures were more readily foreseeable than they were in reality.

- After a project is completed, management will tend to underestimate the value of decision analysis.

- Project managers or analysts who performed the decision analysis tend to overestimate the accuracy of past judgments.

- Evaluation of project decisions can be integrated into established business processes.

- The simplest way to establish a corporate knowledge base is to save documents related to completed projects on a searchable corporate Intranet.

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