1 UNDERSTANDING SUCCESS AND FAILURE

1.0 INTRODUCTION

Most people have a relatively poor understanding of what is meant by project success and project failure. As an example, let's assume you purchase a new car that contains a lot of electronic gadgetry. After a few days, some of the electronics fail to work correctly. Was the purchase of the new car a success or a failure? Most people would refer to this as a glitch or small problem that can be corrected. If the problem is corrected, then you would consider the purchase of the new car as a success.

But now let's assume you purchase a $10 million software package for your company. The software fails to work correctly and your company loses $50 million in sales before the software bugs are removed and the system operates as expected. In this example, the literature would abound with stories about the failure of your software package and how much money your company lost in the process. But if the software package is now bug free and your company is generating revenue from use of the package, then why should the literature refer to this as a failure? Was the purchase and eventual use of the software package a success or a failure? Some people might consider this as a success with glitches along the way that had to be overcome. And we all know that software development rarely occurs without glitches.

Defining success and failure is not clear cut. We all seem to understand what is meant by total success or total failure. But the majority of projects fall into the grey area between success and failure where there may not be any clear definition of the meaning of partial success or partial failure.

Project success has traditionally been defined as completing the requirements within the triple constraints of time, cost and scope (or performance). This is the answer that had been expected of students on most exams. In the same breath, project failure had been defined as the inability to meet the requirements within time, cost and scope. Unfortunately, these definitions do not provide a clear picture or understanding of the health of the project and whether or not success has been achieved. And to make matters worse, the definition of success or failure is treated like the definition of beauty; it is in the eyes of the beholder. Today, we are finally beginning to scrutinize the definitions of project success and project failure.

1.1 SUCCESS: HISTORICAL PERSPECTIVE

The complexities with defining project success and failure can be traced back to the early days of project management. The birth and initial growth of project management began with the Department of Defense (DOD) in the United States. With thousands of contractors, the DOD wanted some form of standardization with regard to project performance reporting. The earned value measurement system (EVMS) was created primarily for this purpose.

For the EVMS to be effective, metrics were needed to track performance and measure or predict project success. Everybody knew that measuring success was complicated and that predicting project success correctly required several metrics. Unfortunately, our understanding of metrics and metric measurement techniques was relatively poor at that time. The result was the implementation of the rule of inversion. The rule of inversion states that the metrics with the highest informational value, especially for decision making and measuring success, should be avoided or never measured because of the difficulty in data collection. Metrics like time and cost are the easiest to measure and should therefore be used. The result was that we then spent too much time on these variables that may have had the least impact on decision making and measuring and predicting project success or project failure. The EVMS, for all practical purposes, had two and only two metrics: time and cost. Several formulas were developed as part of the EVMS, and they were all manipulations of time and cost.

The definition of success was now predicated heavily upon the information that came out of the EVMS, namely time and cost. The triple constraints of time, cost and scope were established as the norm for measuring and predicting project success.

Unfortunately, good intentions often go astray. DOD contracts with the aerospace and defense industry were heavily based upon the performance of the engineering community. In the eyes of the typical engineer, each of the triple constraints did not carry equal importance. For many engineers, scope and especially technical achievement were significantly more important than time or cost. The DOD tried to reinforce the importance of time and cost, but as long as the DOD was willing to pay for the cost overruns and allow schedule slippages, project success was measured by how well performance was achieved regardless of the cost overruns, which could exceed several hundred percent. To make matters worse, many of the engineers viewed project success as the ability to exceed rather than just meet specifications, and to do it using DOD funding. Even though the triple constraints were being promoted as the definition of success, performance actually became the single success criterion.

1.2 EARLY MODIFICATIONS TO TRIPLE CONSTRAINTS

The DOD's willingness to tolerate schedule slippages and cost overruns for the sake of performance gave the project management community the opportunity to consider another constraint, namely customer acceptance. Projects, by definition, are most often unique opportunities that you may never have attempted before and may never attempt again. As such, having accurate estimating databases that can be used to predict the time and cost to achieve success was wishful thinking. Projects that required a great deal of innovation were certainly susceptible to these issues as well as significant cost overruns. To make matters worse, the time and cost estimates were being established by people that knew very little about the complexities of project management and had never been involved in innovation activities.

People began to realize that meeting the time and cost constraints precisely would involve some degree of luck. Would the customer still be willing to accept the deliverables if the project was late by one week, two weeks or three weeks? Would the customer still be willing to accept the deliverables if the cost overrun was $10,000, $20,000, or $100,000?

Now it became apparent that success may not appear as just a single point as shown in Figure 1-1. The small circle within the cube in Figure 1-1 represents the budget, schedule and scope requirements defined by the customer. However, given the risks of the project, success may be identified as all points within the cube. In other words, if the schedule were to slip by

Figure 1-1 Project success boundary box.

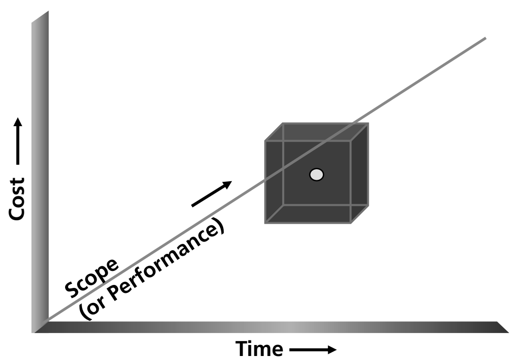
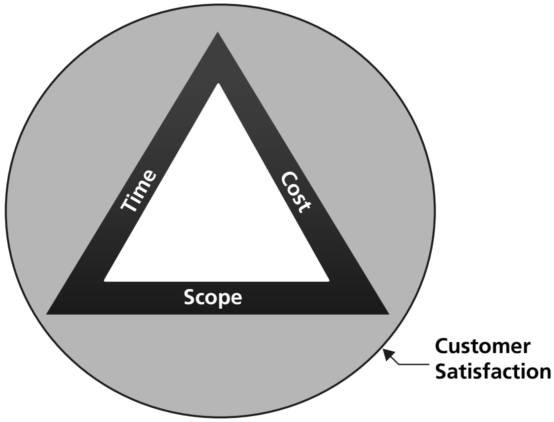


Figure 1-2 Project success defined as customer satisfaction.



up to two weeks, and the budget was exceeded by up to $50,000, and the client was able to receive up to 92% of the initial requirements, then the project might still be regarded as a success. Therefore, success is not just a single point. The hard part is identifying the size and boundaries of the success cube.

Using Figure 1-1, the only definition of success was now customer satisfaction or customer acceptance. For some customers and contractors, time and cost were insignificant compared to customer satisfaction. Having the deliverables late or over budget was certainly better than having no deliverables at all. But customers were not willing to say that success was merely customer acceptance. Time and cost were still important to the customers. As such, the triple constraints were still used but surrounded by a circle of customer satisfaction, as shown in Figure 1-2.

Figure 1-2 made it clear that there may be several definitions of project success because not all constraints carry equal importance. On some projects, customer acceptance may be heavily biased toward cost containment whereas on other projects the scheduled delivery date may be critical.

1.3 PRIMARY AND SECONDARY CONSTRAINTS

As projects became more complex, organizations soon found that the triple constraints were insufficient to clearly define project success even if the constraints were prioritized. There were other constraints that were often more important than time, cost and scope. These "other" constraints were referred to as secondary constraints with time, cost and scope being regarded as the primary constraints. Typical secondary constraints included:

- Using the customer's name as reference at the completion of the project
- Probability of obtaining follow-on work
- Financial success (i.e., profit maximization)
- Achieving technical superiority (i.e., competitive advantage)
- Aesthetic value and usability
- Alignment with strategic planning objectives
- Maintaining regulatory agency requirements
- Abiding by health and safety laws
- Maintaining environmental protection standards
- Enhancing the corporate reputation and image
- Meeting the personal needs of the employees (opportunities for advancement)
- Supporting and maintaining ethical conduct (Sarbannes-Oxley law)

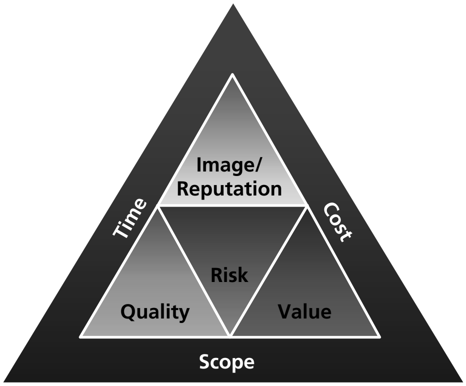
The secondary constraints created challenges for many companies. The EVMS was created to track and report only the primary constraints. To solve the tracking problem, companies created enterprise project management methodologies (EPMs) that incorporated the EVMS and also tracked and reported many of the secondary constraints. This was of critical importance for some companies because the secondary constraints could be more important than the primary constraints. As an example, consider the following situation:

Situation: A vendor was awarded a contract from a new client. The vendor had won the contract because they underbid the job by approximately 40%. When asked why they had grossly underbid the contract, the vendor stated that their definition of success on this contract was the ability to use the client's name as a reference when bidding on other contracts for other clients. Completing the contract at a loss was not as important as using the client's name as a reference in the future.

LESSON LEARNED It is important to have a clear definition of success (and failure) at the beginning of the project.

Even though we now had both primary and secondary constraints, companies still felt compelled to use the traditional triple constraints of time, cost and scope as the primary means for defining success. As shown in Figure 1-3, all of the secondary constraints were inserted within the triangle representing the triple constraints. In this example, shown in Figure 1-3, image/reputation, quality, risk and value were treated as secondary constraints. Discussions over the secondary constraints were made by analyzing the impact they had on the primary constraints, namely whether the secondary constraints elongated or compressed any of the primary constraints.

Figure 1-3 Competing constraints.



1.4 PRIORITIZATION OF CONSTRAINTS

As the number of constraints on a project began to grow, it became important to prioritize the constraints. Not all constraints carry the same weight. As an example, many years ago I had the opportunity to work with some of Disney's project managers at Disneyland and Disneyworld. These were the project managers responsible for creating new attractions. At Disney, there were six constraints on most projects:

- Time
- Cost
- Scope
- Safety
- Quality
- Aesthetic value

At Disney, safety was considered as the single most important constraint, followed by quality and aesthetic value. These three were considered as the high-priority constraints never to undergo any tradeoffs. If tradeoffs were to be made, then the tradeoffs must be made on time, cost or scope. The need for prioritization of the success criteria was now quite clear.

1.5 FROM TRIPLE CONSTRAINTS TO COMPETING CONSTRAINTS

When the Project Management Institute (PMI) released the fourth edition of the *PMBOK® Guide*, the use of the term triple constraints was replaced with the term "competing constraints." Defining project success was now becoming significantly more complicated because of the increasing number of constraints and their importance in defining project success. Everybody knows and understands that "what gets measured, gets done." Therefore, there were three challenges that soon appeared:

- Each new constraint has to be tracked the same way that we traditionally tracked time and cost.
- In order to track the new constraints, we need to establish metrics for each of the constraints. You cannot have a constraint without having a metric to confirm that the constraint is being met.
- Metrics are measurements. We must understand the various measurement techniques available for tracking the new metrics that will be used to predict and report success.

Project success, metrics and measurement techniques were now interrelated. Historically, success was measured using only two knowledge areas of the *PMBOK® Guide*, namely time management and cost management. Today, success metrics can come from any of the 10 knowledge areas in the fifth edition of the *PMBOK® Guide*. It is entirely possibly that, in the future, we will modify the inputs, tools and outputs discussed in the *PMBOK® Guide* to include a metric library as shown in Figure 1-4. In future editions of the *PMBOK® Guide* we may even have supplemental handouts for each knowledge area describing the metrics that are available and how they can be used to track and predict project success. This is shown in Figure 1-5.

Figure 1-4 Future *PMBOK® Guide* and metrics.

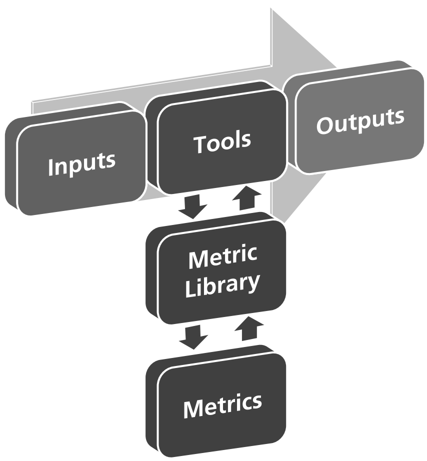
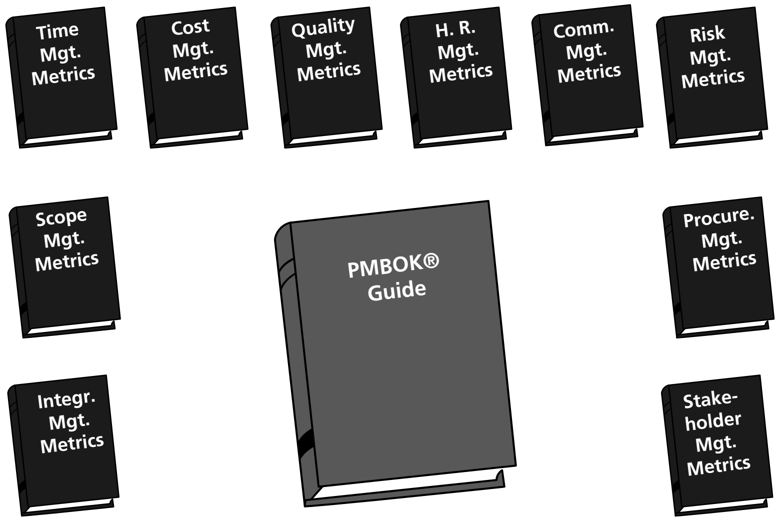


Figure 1-5 Area of knowledge metric handouts.



1.6 FUTURE DEFINITIONS OF PROJECT SUCCESS

Advances in metrics and measurement techniques have allowed us to change our definition of project success and failure. Previously, we stated the importance of customer acceptance as a success criterion. But today, even the term "customer acceptance" is being challenged. According to a study ("Customer Value Management: Gaining Strategic Advantage," The American Productivity and Quality Center [APQC], © 1998, p. 8):

> Although customer satisfaction is still measured and used in decision-making, the majority of partner organizations [used in this study] have shifted their focus from customer satisfaction to customer value.

Advances in measurement techniques have now allowed us to measure such items as value, image reputation and goodwill. Therefore, we can now establish a rather sophisticated and pin-pointed approach to defining project success. Value may become the most important term in defining project success. Having a significant cost overrun and/or schedule slippage may be acceptable as long as business value was created. During the selection of the projects that go into the portfolio of projects, value may become the driver for project selection. After all, why work on a project if the intent is not to create some form of business value? Value may also change the way we define a project. As an example, consider the following:

- *PMBOK® Guide*—**Fifth Edition**, definition of a project: A temporary endeavor undertaken to create a unique product, service or result.
- **Future definition of a project:** A collection of sustainable business value scheduled for realization.

Value can also be used to define project success. As an example:

- **Traditional definition of project success:** Completion of the project within the triple constraints of time, cost and scope.
- **Future definition of project success:** Achieving the desired business value within the competing constraints.

The above definitions make it clear that there is now a business and/or value component added to our definition of project success. Value may very well become the driver for how we measure success or failure in the future. Success or failure is no longer being measured solely by time and cost.

Measuring value by itself is extremely difficult. To overcome the potential problems, it may be easier to define the value success constraint as a composition of other constraints or attributes as shown in Figure 1-6. In other words, constraints from all or part of the six interrelated components in Figure 1-6 will make up the value success constraint.

To illustrate how this might work in the future, let's consider the following scenario. The project manager will meet with the client and possibly the stakeholders at project initiation to come to an agreement as to what is meant by value since value will be perhaps the primary measurement of project success. You show the client the six success constraint categories as listed in Figure 1-6. You and the client must then agree on which constraints will make up the success or value constraint. Let's assume that the client defines project value according to a mixture of the four constraints listed in Table 1-1.

Once the client's value factors are known, you and the client jointly determine which constraints can be used for measurement purposes, the metrics that will be used and how points will be assigned for staying within each constraint. You and the client must then agree on the weighting factor importance of each of the constraints.

Using this method, success is being measured by the ability to meet the value constraint even though the value constraint is composed of four other constraints. It is entirely possible that you are not maintaining performance within one of the constraints, such as the time constraint, but your performance within the other three constraints more than makes up for it to the point where the client perceives that value is still being accomplished and the project is a success.

Figure 1-6 Components of value success constraint.

TABLE 1-1 Components of Client's Value/Success Constraint

CLIENT'S VALUE FACTORS	SUCCESS CONSTRAINT	WEIGHTING FACTOR, %
Quality	Quality	20
Delivery date	Time	30
Usability	Performance	35
Risk minimization	Risk	15

You will also notice in this example that cost was not selected as a component of the success criteria or the value constraint. This does not mean that cost is not important. Cost is still being tracked and reported as part of the project management activities but the client does not consider cost as that critical and as part of the success criteria.

As our projects become larger and more complex, the number of constraints used to define success can grow. And to make matters worse, our definition of success can change over the life of the project. Therefore, our definition of success may be organic. Companies will need to establish metrics for tracking the number of success constraints.

The importance of a project success criterion that includes a value component is critical. All too often, projects are completed just to find out that no business value was created. You can end up creating products that nobody will buy. As an example, consider the following example:

Situation: The Iridium Project[1] was designed to create a worldwide wireless handheld mobile phone system with the ability to communicate anywhere in the world at any time. Executives at both Motorola and Iridium LLP regarded the project as the eighth wonder of the world. But more than a decade later and after investors put up billions of dollars, Iridium had solved a problem that very few customers needed solved.

The Iridium Project was both a success and a failure at the same time. As a success, the 11-year project was completed just 1 month late and more than 1000 patents were created. As a failure, investors lost more than $4 billion because the marketplace for the product had changed significantly over the life of the project. In retrospect, it appears that project success was measured solely by technical performance and the schedule. Had there been a more complete definition of success, including value constraints based upon a valid business case, the project would have been cancelled due to eroding business value well before billions of dollars were wasted.

LESSON LEARNED Revalidation of the business case is a necessity especially on long-term projects.

1.7 DIFFERENT DEFINITIONS OF PROJECT SUCCESS

The use of a value constraint to define success can work well as long as everyone agrees on the definition of success. But on large complex projects involving a governance committee made up of several stakeholders, there can be many definitions of success. There can also be more than one definition of success being used for team members working on the same project. As an example:

Situation: During a project management training program for the R&D group of a paint manufacturer, the question was asked: "How does the R&D group define project success?" The answer was simple and concise: "The commercialization of the product." When asked what happens if nobody purchases the product, the R&D personnel responded, "That's not our problem. That headache belongs to marketing and sales. We did our job and were highly successful."

LESSON LEARNED The business case for a project must have a clearly understood definition of success and hopefully be agreed to by all participants.

1. For information on the Iridium Project, see Harold Kerzner, "The Rise, Fall and Resurrection of Iridium: A Project Management Perspective," *Project Management Case Studies*, Wiley, Hoboken, NJ, 2013, pp. 327–366. A modified version of the case study appears in Section 3.6.

1.8 UNDERSTANDING PROJECT FAILURE

Most companies seem to have a relatively poor understanding of what is meant by project failure. Project failure is not necessarily the opposite of project success. Simply because we could not meet the project's success criteria is not an indication that the project was a total failure. Consider the following example:

Situation: During an internal meeting to discuss the health of various projects undertaken to create new products, a vice president complained that less than 20% of the R&D projects were successful and reached the product commercialization stage. He then blamed poor project management for the failures of the other 80% of the projects. The director of the Project Management Office then spoke up asserting that most of the other 80% of the projects were not failures. They had in fact created intellectual property that was later used on other R&D projects (i.e., spinoffs) to create commercially successful products.

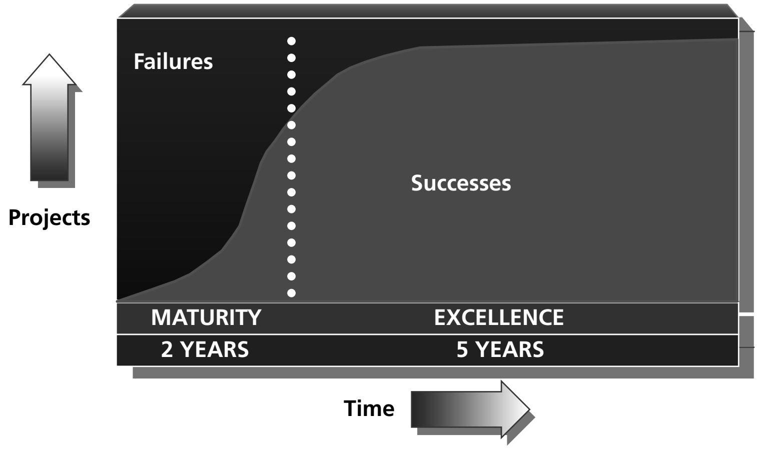
LESSON LEARNED Projects that create intellectual property, perhaps for future use, should not always be regarded as a total failure.

The above example should make it clear that the definition of project failure is more of a grey area than pure black and white. If knowledge and/or intellectual property is gained on the project, then perhaps the project should not be considered as a complete failure. All project managers know that things may not always go according to plan. Replanning is a necessity in project management. We can begin a project with the best of intentions and prepare a plan based upon the least risk. Unfortunately, the least risk plan usually requires more time and more money. If the project must be replanned using least time as the primary success criterion, then we must be willing to incur more risk and perhaps additional costs.

There is no universally accepted diagnosis as to why projects fail because each project has its own set of requirements, its own unique project team and its own success criteria and can succumb to changes in the enterprise environmental factors. Failures can and will happen on some projects regardless of the company's maturity level in project management. As seen in Figure 1-7, it often takes companies two years or longer to become reasonably good at project management and perhaps another five years to reach some degree of excellence. Excellence in project management is defined as a continuous stream of projects that meet the company's project success criteria.

But as seen in Figure 1-7, even with a high degree of project management excellence, some projects can and will fail. There are three reasons for this:

Figure 1-7 Some projects will fail.



- Any executive that always makes the right decision certainly isn't making enough decisions.
- Effective project management practices can increase your chances of project success but cannot guarantee that success will be achieved.
- Business survival is often based upon how well the company is able to accept and manage business risks. Knowing which risks are worth accepting is a difficult process.

1.9 DEGREES OF PROJECT FAILURE

One of the most commonly read reports on why IT projects fail is the Chaos Report prepared by the Standish Group. The Chaos Report identifies three types of IT project outcomes:

- **Success:** A project that gets accolades and corporatewide recognition for having been completed on time, within budget and meeting all specification requirements.
- **Challenged:** A project that finally reaches conclusion, but there were cost overruns and schedule slippages, and perhaps not all of the specifications were met.
- **Failure:** A project that was abandoned or cancelled due to some form of project management failure.

It is interesting to note how quickly IT personnel blame project management as the primary reason for an IT failure. Although these categories may be acceptable for IT projects, it may be better to use the following breakdown for all projects in general:

- **Complete success:** The project met the success criteria, value was created and all constraints were adhered to.
- **Partial success:** The project met the success criteria, the client accepted the deliverables and value was created although one or more of the success constraints were not met.
- **Partial failure:** The project was not completed as expected and may have been cancelled early on in the life cycle. However, knowledge and/or intellectual property was created that may be used on future projects.
- **Complete failure:** The project was abandoned and nothing was learned from the project.

The following situations provide examples of each of these categories.

Situation: A company undertook a 1-year R&D project designed to create a new product. Assuming the product could be developed, the company had hoped to sell 500,000 units over a 2-year period. During the R&D effort, the R&D project team informed management that they could add significant value to the product if they were given more money and if the schedule were allowed to slip by about 6 months. Management agreed to the schedule slippage and the cost overrun despite resistance from sales and marketing. More than 700,000 units were sold over the first 12 months after product release. The increase in sales more than made up for the cost overrun.

LESSON LEARNED In this situation, the project was considered as a complete success even though there was a schedule slippage and a cost overrun. Significant value was added to the business.

Situation: A company won a contract through competitive bidding. The contract stipulated that the final product had to perform within a certain range dictated by the product's specifications. Although there were no cost overruns or schedule slippages, the final product could meet only 90% of the specification's performance requirements. The client reluctantly accepted the product and later gave the contractor a follow-on contract to see if they could reach 100% of the specification's performance requirements.

LESSON LEARNED This situation was considered as a partial success. Had the client not accepted the deliverable, the project may have been classified as a failure.

Situation: A company had a desperate need for software for part of its business. A project was established to determine whether to create the software from scratch or to purchase an off-the-shelf package.

The decision was made to purchase an expensive software package shortly after one of the senior managers in a software company made an excellent presentation on the benefits the company would see after purchasing and using the software as stated. After purchasing the software, the company realized that it could not get the expected benefits unless the software was custom designed to its business model. The software company refused to do any customization and reiterated that the benefits would be there if the software was used as stated. Unfortunately, it could not be used as stated, and the package was shelved.

Situation: A hospital had a policy where physicians and administrators would act as sponsors on large projects even though they had virtually no knowledge about project management. Most of the sponsors also served on the committee that established the portfolio of projects. When time came to purchase software for project management applications, a project team was established to select the package to be procured. The project team was composed entirely of project sponsors that had limited knowledge of project management. Thinking that they were doing a good thing, the committee purchased a $130,000 software package with the expectation that it would be used by all of the project managers. The committee quickly discovered that the organization was reasonably immature in project management and that the software was beyond the capabilities of most project team members. The software was never used.

LESSON LEARNED In the above situation, the company considered the project as a total failure. No value was received for the money spent. Eventually the company committed funds to create its own software package customized for its business applications.

Situation: A company was having difficulty with its projects and hired a consulting company for project management assistance. The decision to hire the company was largely due to a presentation made by one of the partners that had more than 20 years of project management experience.

LESSON LEARNED The above situation, just like the previous situation, was considered as a complete failure.

After the consulting contract was signed, the consulting company assigned a small team of people, most of which were recent college graduates with virtually no project management experience. The consulting team was given offices in the client's company and use of client's computers.

The consulting team acted merely as note-takers in meetings. The quarterly reports they provide to the client were simply a consolidation of the notes they would take during project team meetings. The consulting team was fired since they were providing no value. The client was able to recover from the company's computers several of the e-mails

LESSON LEARNED In the above example, the client eventually sued the consulting company for failure to perform and collected some damages. The client considered the consulting project as a complete failure.

sent from the consultants to their superiors. One of the e-mails that came from the headquarters of the consulting company stated, "We know we didn't give you a qualified team, but do the best you can with what you have." The client never paid the consulting company the balance of the money due on the contract.

Situation: A company worked on an R&D project for more than a year just to discover that what it wanted to do simply would not happen. However, during the research, the company found some interesting results that later could be used in creating other products.

LESSON LEARNED Although this project was a partial failure, it did create intellectual property that could be used later.

1.10 OTHER CATEGORIES OF PROJECT FAILURE

Rather than defining failure as either partial or total failure, some articles define failure as preimplementation failure and postimplementation failure. With preimplementation failure, the project is never completed. This could be the result of a poor business case, inability of the team to deliver, a change in the enterprise environmental factors, changing business needs, higher priority projects or any other factors which mandate that senior management pull the plug. The result could be a partial or total failure.

With postimplementation failure, the project is completed and everyone may have high expectations that the deliverables will perform as expected. However, as is the case in IT, postimplementation is when the software bugs appear sometimes causing major systems to be shut down until repairs can be made. The larger and more complex the software package, the less likely it is that sufficient test cases have been made for every possible scenario that could happen in implementation. If daily business operations are predicated upon a system that must be shut down, the failure and resulting losses can run into the hundreds of millions of dollars. Consider the following examples:

- In 2008, the London Stock Exchange's clients were trading more than $17 billion each day. On what was expected to be one of the busiest trading days in months largely due to the U.S. government's takeover of Fannie Mae and Freddie Mac, 352 million shares worth $2.5 billion were traded in the first hour of trading right before the system shut down. For more than 7 hours, investors were unable to buy or sell shares.
- In October 2005, British food retailer Sainsbury scrapped a $528 million investment in an automated supply chain management system that was unable to get merchandise from its warehouses to its retail stores.

Eventually, the company was forced to hire 3000 additional employees to stock the shelves manually.

- In May 2005 Toyota recalled 160,000 Prius hybrid vehicles because warning lights were illuminating unexpectedly and the cars' gasoline engines began stalling. The culprit was a software bug that was in the car's embedded code.
- On April 16, 2013, a glitch in the reservation system at American Airlines grounded all flights leaving thousands stranded for hours. American Airlines has 3500 flights daily on a worldwide basis and an estimated 100,000 passengers were affected by the delays. Approximately 720 flights were cancelled. Although American Airlines rebooked passengers on other flights, American Airlines also warned that delays could continue for several days, thus affecting future flights. A similar situation occurred at Comair Airlines a few years earlier where more than 1000 flights were cancelled. The glitch was also in the reservation system.

Postimplementation failures can become so costly that a company may find itself on the brink of bankruptcy.

1.11 SUMMARY OF LESSONS LEARNED

It is much more difficult than people believe to have a clear understanding of success and failure. Project complexity will force us to better understand those constraints that have a direct bearing upon the project's success criteria. Advances must be made in the use of metrics and metric measurement techniques to assist us with a better understanding of success and failure.

A checklist of techniques that might be used for a better understanding of success and failure includes:

- ☐ Work with the client and the stakeholders to see if an agreement can be reached on the definition of success and failure.
- ☐ Work with the client and the stakeholders to identify the critical success factors.
- ☐ Establish the necessary metrics for each of the critical success factors.
- ☐ Prioritize the critical success factors and the metrics.
- ☐ Throughout the project, revalidate the business case and the accompanying critical success factors.
- ☐ Project failures will happen and it may not be the result of poor project management practices.
- ☐ Project complexity will force us to better understand those constraints that have a direct bearing upon the project's success criteria.
- ☐ Advances must be made in the use of metrics and metric measurement techniques.

TABLE 1-2 ***PMBOK® Guide*** **Alignment to Lessons Learned**

LESSONS LEARNED	*PMBOK® GUIDE* SECTIONS
Defining success and failure is not easy.	1.3, 1.4, 2.2.3
Definitions can change from project to project.	2.2.3
Defining success and failure requires a combination of metrics that can be unique for each project and program.	1.3, 1.4, 2.2.3, 8.1.3.3, 8.2.1.3, 8.3.1.2
Not all success and failure constraints carry the same level of importance.	1.4, 2.2.3, 8.3.3.3
There must be a clear definition of success at the beginning of a project and all parties must agree to it.	1.3, 1.4, 2.2.3, 3.3
A project value success factor, which is a combination of several constraints, may be used rather than reporting on all of the constraints.	1.6, 8.1.3.3, 8.2.1.3, 8.3.1.2
Every project should have a business and/or value constraint.	1.6
Revalidation of the business case must be done periodically to make sure that we are still creating business value.	1.4.3, 1.6
There are degrees of project success and failure.	1.3, 1.4, 2.2.3
Project replanning can change the definitions of project success and failure.	2.2.3
The expectation that all projects will be successful is unrealistic.	2.2.3

Table 1-2 provides a summary of the lessons learned and alignment to various sections of the *PMBOK® Guide* where additional or supporting information can be found. In some cases, these sections of the *PMBOK® Guide* simply provide supporting information related to the lesson learned. There are numerous sections of the *PMBOK® Guide* that could be aligned for each lesson learned. For simplicity sake, only a few are listed.