

Anatomy of a Failed Project: The First Panama Canal Project

Risk management is never just about looking forward. Heeding the lessons learned on projects of all types—even some distant examples—can help you avoid problems on new projects. One such example, illustrating that people have been making similar mistakes for a long, long time, is the initial effort by the French to construct a canal across Panama.

The building of the Panama Canal was not an infeasible project; it was, after all, ultimately completed. However, the initial undertaking was certainly premature. The first canal project, begun in the late 1800s, was a massive challenge for the technology of the day. That said, lack of project management contributed significantly to the decision to go forward in the first place, the many project problems, and the ultimate failure.

Precise definition for the project was unclear, even years into the work. Planning was not thorough, and changes in the work were frequent and managed informally. Reporting on the project was sporadic and generally inaccurate (or even dishonest). Risks were not identified effectively or were ignored, and the primary risk management strategy seems to have been “hoping for the best.”

Although there was speculation far earlier, the first serious investigation of a canal in Central America was in the mid-1800s. Estimates were that such a canal would provide US\$48 million a year in shipping savings, and might be built for less than US\$100 million. Further study on-site was less optimistic, but in 1850 construction of a railroad across the Isthmus of Panama started. The railroad was ultimately completed, but the US\$1.5 million, two-year project swelled to US\$8 million before it was finished, three years late in 1855. After a slow start, the railroad did prove to be a financial success, but its construction problems foreshadowed the canal efforts to come.

A few years later on the other side of the world, the Suez Canal was completed and opened in 1869. This project was sponsored and led successfully from Paris by Ferdinand de Lesseps. This triumph earned him the nickname "The Great Engineer," although he was actually a diplomat by training, not an engineer at all. He had no technical background and only modest skills as an administrator. However, he had completed a project many thought to be impossible and was now world famous. The Suez project was a huge financial success, and de Lesseps and his backers were eager to take on new challenges.

Examining the world map, de Lesseps decided a canal at Panama would be his next triumph, so in the late 1870s a French syndicate negotiated the necessary agreements in Bogota, Colombia, as Panama was then the northernmost part of Colombia. They were granted rights to build and operate a canal in exchange for a small percentage of the revenue to be generated over ninety-nine years.

Although it might seem curious today that these canal construction projects so far from France originated there, in the late 1800s Paris was the center of the engineering universe. The best schools in the world were there, and many engineering giants of the day lived in Paris, including Gustav Eiffel (then planning his tower). Such technical projects could hardly have arisen anywhere else.

The process of defining the Panama project started promisingly enough. In 1879 Ferdinand de Lesseps sponsored an International Congress to study the feasibility of a canal connecting the Atlantic and Pacific oceans through Central America. Over a hundred delegates gathered in Paris from a large number of nations, though most of the delegates were French. A number of routes were considered, and canals through Nicaragua and Panama both were recommended as possibilities. Construction ideas, including a realistic "lock-and-dam" concept (somewhat similar to the canal in service today), were also proposed. In the end, though, the Congress voted to support a sea-level canal project at Panama, even though nearly all the engineers present thought the idea infeasible and voted against it. Not listening to technical people is a perilous way to start a project. The Panama Canal was neither the first nor the last project to create its own problems through insufficient technical input.

Planning for the project was also a low priority. De Lesseps paid little attention to technical problems. He believed need would result in innovation as it had at Suez, and the future would take care of itself. He valued his own opinions and ignored the views of those who disagreed with him, even recognized authorities. An inveterate optimist, he was convinced, based only on self-confidence, that he could not fail. These attitudes are not conducive to good risk management; there are few things more dangerous to a project than an overly optimistic project leader.

The broad objective de Lesseps set for his *Compagnie Universale du Canal Interoceanique* was to build a sea-level canal in twelve years, to open in 1892. He raised US\$60 million from investors through public offerings—a lot of money, but still less than one-third of the initial engineering cost estimate of more than US\$200 million. In addition to this financial shortfall, there was little detailed planning done before work actually commenced, and most of that was done at the 1879 meeting in Paris. Even on the visits that de Lesseps made to Panama and New York to build support for the project, he failed to involve his technical people.

Eventually the engineers did travel to Panama, and digging started in 1882. Quickly, estimates of the volume of excavation required started to rise, to 120 million cubic meters—almost triple the estimates that were used for the decisions in 1879. As the magnitude of the effort rose, de Lesseps made no public changes to his cost estimates or to the completion date.

Management of risks on the project, inadequate at the start, improved little in the early stages of execution. There were many problems. Panama is in the tropics, and torrential rains for much of the year created floods that impeded the digging and made the work dangerous. The frequent rains turned Panama's clay into a flowing, sticky sludge that bogged down work, and the moist, tropical salt air combined with the viscous mud to destroy the machinery. There was also the issue of elevation. The continental divide in Panama is not too high by North or South American standards, but it does rise to more than 130 meters. For a canal to cross Central America, it would be necessary to dig a trench more than fifteen kilometers long to this depth, an unprecedented amount of excavation. Digging the remainder of the eighty-kilometer transit across the isthmus was nearly as daunting.

Adequate funding for the work was also a problem, as only a portion of the money that was raised was allocated to construction (most of the money went for publicity, including a impressive periodic *Canal Bulletin*, used to build interest and support). Worst of all, diseases, especially malaria and yellow fever, were lethal to many workers not native to the tropics, who died by the hundreds. As work progressed, the engineers, already dubious, increasingly believed the plan to dig a sea-level canal was doomed.

Intense interest in the project and a steady stream of new workers kept work going, and the *Canal Bulletin* reported good progress (regardless of what was actually happening). As the project progressed there were changes. Several years into the project, in 1885, the cost estimates were finally raised, and investors provided new funds that quadrupled the project budget to US\$240 million. The expected opening of the canal was delayed "somewhat," but no specific date was offered. Claims

were made at this time that the canal was half dug, but the truth was probably less than 15 percent. Information on the project was far from trustworthy.

In 1887, costs were again revised upward, exceeding US\$330 million. The additional money was borrowed, as de Lesseps could find no new investors. Following years of struggle and frustration, the engineers finally won the debate over construction of a canal at sea level. Plans were shifted to construct dams on the rivers near each coast to create large lakes that would serve as much of the transit. Sets of locks would be needed to bring ships up to, and down from, these man-made lakes. Although this would slow the transit of ships somewhat, it significantly reduced the necessary excavation.

Even with these changes, problems continued to mount, and by 1889 more revisions and even more money were needed. After repeated failures to raise funding, de Lesseps liquidated the *Compagnie Universel du Canal Interoceanique*, and the project ended. This collapse caused complete financial losses for all the investors. By 1892 scandals were rampant, and the bad press and blame spread far and wide. Soon the lawyers and courts of France were busy dealing with the project's aftermath.

The French do not seem to have done a formal postproject analysis, but looking at the project in retrospect reveals over a decade of work, more than US\$300 million spent, lots of digging, and no canal. Following the years of effort, the site was ugly and an ecological mess. The cost of this project also included at least 20,000 lives lost (many workers who came to Panama died so soon after their arrival that their deaths were never recorded; some estimates of the death toll run as high as 25,000). Directly as a result of this project failure, the French government fell in 1892, ending one of the messiest and most costly project failures in history.

The leader of this project did not fare well in the wake of this disaster. Ferdinand de Lesseps was not technical, and he was misguided in his beliefs that equipment and medicines would appear when needed. He also chronically reported more progress than was real (through either poor analysis or deception; the records are not clear enough to tell). He died a broken man, in poverty. Had he never undertaken the project at Panama, he would have been remembered as the heroic builder of the Suez Canal. Instead, his name is primarily linked to the failure at Panama.

Perhaps the one positive outcome from all this was clear evidence that building a sea-level canal at Panama was all but impossible because of rains, flooding, geology, and other challenges. These are problems that probably could not be surmounted even with current technology.

Although it is not possible ever to know whether a canal at Panama could have been constructed in the 1880s, better project and risk management practices, widely available at the time, would have helped

substantially. Setting a more appropriate initial objective, or at least modifying it sooner, would have improved the likelihood of success. Honest, more frequent communication—the foundation of well-run projects—would almost certainly have either forced these changes or led to earlier abandonment of the work, saving thousands of lives and a great deal of money.