

Learning the Lessons of Apollo 13

IS "disasters" may not be as life-threatening, but the same rules apply.



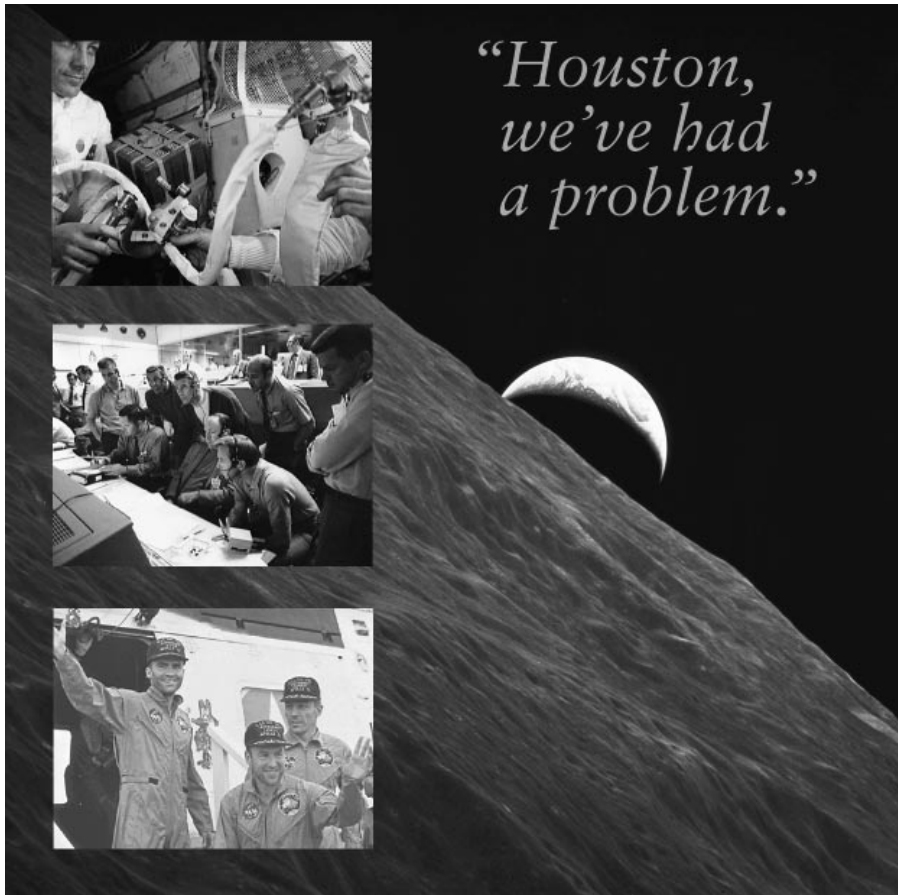
On Howard's epic movie *Apollo 13* recounts the ill-fated Apollo 13 mission to the moon, a mission that came close to causing the first loss of life in space for a U.S. astronaut. They were only a third of the way into the mission when one of the oxygen tanks in the command ship *Odyssey* exploded, crippling the spacecraft and endangering the lives of the crew.

The story of Apollo 13 is one of hope, inspiration and perseverance, and one that holds many useful parallels for those in the field of information system project management. What are these parallels? Consider the factors that contributed to the success of the Apollo program.

Have a Clear Objective. More than anything else, having a clear objective helps to ensure a successful project. With the Apollo program, that objective was to land a man on the moon and return him safely to earth, a goal that was achieved just seven short years after President Kennedy first issued the challenge to the nation and the world.

To be successful, IS projects must also have clear goals and objectives. A complete statement of a project's objectives, milestones and requirements, embodied in a Statement of Work or similar contractual document, helps to ensure that everyone agrees on the purpose and deliverables of the project. This also keeps everyone focused on the business reason for doing the project in the first place.

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Fifty-five hours into the Apollo 13 mission an oxygen tank exploded, severely crippling the ship about 200,000 miles from Earth. Loss of oxygen meant loss of power, and the undamaged, self-contained lunar module became the crew's lifeboat. The emergency measures this forced included cobbling together a higher capacity CO₂ scrubber using on-board materials (top). On the ground, mission control teams worked around the clock to solve new technical challenges (middle). The team's efforts paid off, and the crew of Apollo 13 splashed down safely on April 17, 1970.

Pick the Best People. The Apollo astronauts were the best of the best. Selected from the top test and military pilots, they were the most highly qualified and capable people available. That level of excellence showed when it came to overcoming obstacles and achieving the impossible, as was often required to complete the Apollo missions.

To achieve success in IS projects, we must also seek to employ the best people available, especially for the project manager and lead technical staff. We should seek to hire industry specialists with broad experience drawn from diverse assignments—people who can overcome the unexpected problems that occur in even the best planned project. By hiring the best, you acquire people who have

already been tempered by the fires of adversity and have overcome them.

Support Them With the Best Team. No matter how good the astronauts were, they would never have been successful without the team that supported them and their mission. From the scientists and engineers who built the rockets, to the programmers who wrote the navigation programs, to the seamstress who sewed the spacesuits, the success of the Apollo missions resulted from thousands of people pulling together to achieve something that once seemed impossible.

In IS projects, it's not the project manager but the project team that achieves the project objectives. Team leaders, programmers, testers, tech writers: the typical large IS project needs all

these people and more to pull together diverse technology to meet a customer's business objectives. The project manager melds this diverse group of people into the effective team needed to meet the project objectives.

Support Them With the Best Equipment and Technology. The Apollo program achieved its objective by employing the best technology available at the time. In many cases, that technology was created specifically for the Apollo program and in turn led to advances in commercial industry.

IS projects don't have the luxury of the "blank checkbook" that the managers of the Apollo program did. Nevertheless, technology can be used in numerous ways to boost the productivity of the project team and help to ensure their success. From personal development systems, to CASE and design tools, to project management software and even e-mail to facilitate communication, the improvements in productivity and quality that technology brings are well worth the initial capital costs to the project.

Train Constantly. The Apollo astronauts trained constantly, and kept training until the last moment. A backup crew trained beside them so that someone would be available to carry out the mission if for any reason the primary team was unable to.

For IS project teams, training is also essential. Whether it is training to understand and use the technology being deployed (such as client/server), training in the use of tools, or training in project management or some other facet of project implementation, training is better done beforehand rather than in the heat of project implementation. All too often team members are expected to just "read the manual" to bring themselves up to speed with a new system or tool, and management expresses surprise when the quality and productivity gains expected are not realized. This attitude toward training would have been unacceptable for the Apollo program and should be unacceptable for IS projects as well.

Prepare for the Unexpected. For the astronauts and mission planners, preparing for the unexpected was a crucial part

of the program. They knew they were exploring unknown territory and therefore had to prepare contingencies for situations they might encounter. Their training for the unexpected, along with the redundancies and engineering of their spacecraft for those contingencies, enabled the Apollo 13 astronauts to survive.

For IS projects, preparing for the unknown starts with the initial project planning, where allowances should be built into the plan to account for both known and unknown possibilities. An active risk management program should be in place from the beginning of the project and updated throughout the project life cycle to ensure that the project is as prepared as possible for whatever problems, either technological or otherwise, may arise.

For the Apollo astronauts, these factors were not only instrumental in their success, they were also integral to ensuring their survival. However, even when all precautions are taken and all the planning, training, and engineering has been done to the best of everyone's ability, "Murphy" can still strike.

Never Consider Defeat. When this disaster struck, the mission controllers, mission team and crew of Apollo 13 never allowed themselves to consider the possibility that the crew would not make it back. Whether it was the initial objective of getting to the moon, or the revised objective of bringing the astronauts home safely, they knew they could not fail, and therefore they made sure they didn't.

While human lives are not at stake for most IS projects, the principle remains the same. When disaster strikes on a project, as long as you proceed from the standpoint that the project *can* succeed and *must* succeed, you'll find you have the drive to see that it *will* succeed.

Improvise. When the Apollo 13 ship was crippled, the mission team had to use their ingenuity to solve their problems. Hundreds of thousands of miles from Earth, with no way to replace the failed CO₂ scrubbers, they had to make new ones from what they had available. Likewise, when the oxygen and power on the command ship Odyssey failed, the team improvised and made use of the lunar lander Aquarius.

Art Imitates Life

When he watched *Apollo 13*, PMI member Frank Saladis of Applied Business Technologies in New York heard those cinematic project managers make a lot of familiar statements. He compiled them to share with his organization and *PM Network* readers:

"Work the problem, people. Let's not make things worse by guessing."

"Start replanning—improvise."

"Failure is not an option!"

"Skip things that are not absolutely needed."

"Identify contingencies."

"Here is what you need to make, and here is what you have to work with."

"We are no strangers to emergencies."

"This was a successful failure!"

For Saladis, the movie brought home how the smallest detail can have a major impact on your project. "When they calculated the return trajectory," he notes, "they forgot to compensate for the fact that they did not have the weight of the moon rocks on the capsule. This slight change in the return path almost caused the capsule to burn up."

For further inspiration, Saladis suggests *The Bridge on the River Kwai*. "There is a 30-minute segment in this film that depicts a classic project management planning session, complete with agenda, resource planning, risk management, material requirements, schedule, site planning, etc."

So zip down to the video store for a little project management education!

For IS projects, when disaster strikes—the project is late, over budget or delivering poor quality products—improvising with what you have available can provide a solution. This often means redefining the parameters of the project, whether the schedule, budget or deliverables, so that you can turn certain failure for the entire project back into success for a modified project that still meets the fundamental business objectives.

Take Risks. The crew and mission team of Apollo 13 knew that they had to cut corners and take chances if they were going to survive. From piloting the spacecraft manually to cutting checklists to a minimum, with certain death the alternative, the mission team took calculated risks to ensure their survival.

When an IS project is in trouble, the project manager must also take calculated risks to help ensure its survival—a gamble with new technologies, new people or new processes. When faced with a choice between certain failure or possible success, the project manager must have the guts to take the risks and to face the consequences if failures occur.

Turn Failure into Success. Success can be found even in failure. For the Apollo 13 mission, that success was the achievement of bringing the crew back safely against all odds. The interest this generated revived the flagging public support for the Apollo program (for a time) and helped renew the commitment to safety within the space program (until it flagged again, leading to the Challenger disaster).

In IS projects, even when we fail and the project is canceled, there is always a lesson to be learned. Whatever the reason for the failure or cancellation, it should be looked on as an opportunity to learn and improve so that future failures can be prevented. The adage "Unless we learn from history, we are doomed to repeat it" is as true for IS projects as it is for missions to the moon. ■

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