Using "The Flight of the Phoenix" to teach the fundamentals of project management

James Schaefer
University of Evansville

Katherine L. Kleindorfer
University of Evansville

ABSTRACT

This paper demonstrates how the motion picture The Flight of the Phoenix can be used to teach the fundamentals of project management and inspire insight into concepts of progressive elaboration and teamwork. By providing a brief overview of project management to students before screening the film in class, educators and trainers can guide students to identify and apply effective project management techniques.

Keywords: progressive elaboration, project charter, project manager, scarcity of resources, training methodology

INTRODUCTION

The Flight of the Phoenix, based on the Trevor Dudley-Smith (1964) novel of the same name, is a 143-minute motion picture (Aldrich & Blake, 1965) that tells the tale of a cargo plane that crashed in the Sahara Desert. With no working radio or access to potable water, the survivors ultimately overcome numerous obstacles to construct a smaller airplane from the wreckage and fly it to safety. The film and its participants received multiple award nominations in the United States. It was remade as a 113-minute film with a fresh cast of characters and changes to the script and setting in 2004 (Aldrich, Blum, Davis, & Godfrey, 2004). The 2004 version is entertaining but excludes several scenes, such as Dorfman's use of progressive elaboration, and the general human conflict is portrayed more realistically in the original version. This paper describes how the original motion picture (Aldrich & Blake, 1965) can be used to introduce students to project management and provide insights on enhanced project management skills to aspiring and current project managers.

A project is a temporary endeavor undertaken to create a unique product, service, or result. Temporary conveys a definite beginning and a definite end. Uniqueness involves doing something that has not been done before (Project Management Institute, 2008). The Project Management Institute (PMI) is the most widely recognized professional organization dedicated to the advancement of the field of project management through instruction and testing for certification (Heldman, 2004). Its published body of knowledge, A Guide to the Project Management Body of Knowledge ([PMBOK] PMI, 2000) is considered the gold standard of project management processes and procedures.

PMBOK defines project management as the application of knowledge, skills, tools, and techniques to a broad range of activities to meet the requirements of a particular project (PMI, 2008). Project management is comprised of five process groups: initiating, planning, executing, controlling, and closing. There are also nine knowledge areas that address management expertise of integration, scope, time, cost, quality, human resources, communications, risk, and procurement (PMI, 2000).

Successful project management requires application of specific management techniques. For example, competencies of available staffing must be assessed. Team integration and management can be the difference between buy-in and apathy to project success. Team members just believe their input is important and valued so that their contributions to success become a collective pull together, not a push apart (Pappas, 2005).

BACKGROUND

The Flight of the Phoenix (Aldrich & Blake, 1965; Aldrich et al., 2004; Dudley-Smith, 1964) is based on a real-life event from World War II in which a twin-engine cargo plane crashed in the desert. In the actual incident, the flight mechanic was able to construct a one-engine plane that was flown with six men strapped to a wing to an allied base (Bart, 1965).

The film (Aldrich & Blake, 1965) begins with the takeoff of a twin-engine aircraft that has been tasked to ferry oil workers to Benghazi. Aging pilot Frank Towns, portrayed by Jimmy Stewart, is nearing the end of his flying career. The only other crew member is the alcoholic navigator Lou Moran (portrayed by Richard Attenborough). Due in part to inattention to detail, the flight takes off with an inoperative radio and a faulty voltage regulator.

En route, the plane flies through a sandstorm and is forced to make a crash landing. Having been pushed off course and with no means of contacting help, the survivors are stranded in the desert. They have a limited supply of water and their only food is pressed dates. Having incorrectly assumed they would be rescued, the survivors slowly recognize the precariousness of their situation. One of the passengers, British Army officer Cpt. Harris, proposes taking an inventory of available resources while Pilot Towns remains curiously disengaged (perhaps due to the death of two passengers in the crash), allowing the military man to bring order to their situation, even asking Harris to work out the details of rationing water with Navigator Moran.

After being stranded for five days and enduring two sandstorms and a passenger's mental collapse, two passengers realize action is warranted. Cpt. Harris proposes a march to safety and, although the others realize a 10-mile hike through the desert is not a viable solution, he is not dissuaded. Harris and another passenger march away from the wreckage and Harris soon returns alone and defeated. The hike resulted in the death of a third passenger.

Heinrich Dorfman, another passenger on the unfortunate adventure, proposes another solution. After studying the situation in detail, Dorfman announces they have everything necessary to build another plane and fly it to safety. Town's immediate reaction is skepticism and ridicule, which sets the stage for a conflict that continues for the rest of the movie. Later, Towns and Moran realize that Dorfman is an aircraft designer by trade.

Construction of the new, smaller plane is a project (PMI, 2008) in many respects. It is temporary in that it has a beginning and it will have an end when the plane is flown to safety. Building the new plane is unique in this situation because the new plane will be built from scraps of the old, crashed plane; it had not been done before. The objective—building the new plane and flying it to safety—is apparent. The work will be performed by a team comprised of survivors. Given the time constraints and scarcity of resources, the scope of the project is stable and challenging.

One disadvantage to using the film as a talking point for project management techniques is the absence of a charter. Per PMI (2008), the charter is an output of a strong initiation process. A charter documents the need for the project, identifies a project manager, and clearly notes who has the authority to apply organizational resources to achieve project objectives (PMI, 2008).

Many real-life projects are initiated in response to disasters or near disasters. In these situations, charters are, at best, prepared quickly and assumed to be subject to modification as needed. Although construction of the new plane does not strictly follow sound project planning processes, it reflects a hastily conceived project with a tacitly understood, if not actually documented, charter. Crashing in the desert was not planned or foreseen, and no one holds the innate position of authority.

Leadership should be evident and strong, but on some projects, it is neither. In The Flight of the Phoenix (Aldrich & Blake, 1965), the survivors did not initially agree to attempt to construct the new plane from the remnants of the old plane; there was no buy-in. This behavior is sometimes reflected in real life. Even when a project charter is issued, the project may not always be universally endorsed; there may be reluctant participants. In the film, most of the passengers look to Pilot Towns for leadership; they do not believe Dorfman's plan will succeed. It is another passenger, Dr. Renad (a physician), who convinces Towns that attempting to build the new plane will afford some hope in the form of constructive activity. This situation reflects the concepts that describe how quickly groups and individuals adapt to change. Some are eager to seize new ideas, some follow shortly thereafter, and others may never buy in, even after the change has proven effective.

In The Flight of the Phoenix, the project revolves around one man's (Dorfman's) idea, which is not universally endorsed. The pilot was in command when the group was airborne but there are no clearly defined lines of authority for the stranded group. The group seems to defer to the pilot who, for reasons left to interpretation, eschews the responsibility. Tension in the group is exacerbated by Dorfman's personality (arrogant and abrasive), which limits his ability to persuade others to buy into the project. Because the project has no charter, Dorfman has no legitimate power, even though the project is his idea. Additional challenges to Dorfman's authority are reviewed in the discussion.

METHODOLOGY

Class, typically an undergraduate management course, begins with a basic overview of quality terminology (one good source is http://www.asq.org) and a brief presentation of supplemental material to enhance the standard classroom text. The objective of presenting the overview is to introduce the concepts of project management and orient the students to the definitions of project versus operations, role of the charter, role of project manager, and progressive elaboration. Following this orientation to project management, the class views a video presentation of the film, often in a series of three 50-minute sessions, after which a question-and-answer session is conducted (see DISCUSSION). Some professors and professional trainers may not wish to nearly 3 hours of class time to showing the film. Viewing the film can be assigned as homework before the instruction or training begins.

The approach to introducing these concepts to novice project managers and sophisticated audiences is slightly different, although the lack of clarity of goal and conflict in teams is fairly common. Linking the lesson and the film to actual work projects partnered with information about moving forward effectively when involved in challenging projects has the potential for powerful learning.

Students and Novice Project Managers

For novices to project management, a break from lecture and note-taking is welcomed. Viewing the film is perceived as a fun and unusual approach to instruction. Undergraduate students and novices to project management are assumed to have limited or no knowledge about project management. Using the PMBOK (PMI, 2000), the following information is presented in brief format as background for viewing the film:

- Definition of a project
- Characteristics of a project (temporary, unique, progressive elaboration)
- Difference between project work and operations
- Role of project management
- Typical project phases

Following this overview, the class is instructed to view the film from the perspective of project management. The film is assigned to be viewed on students' own time as homework or is shown over a series of class sessions.

After watching the video, students form small groups of eight or fewer participants to engage in discussion of the following questions:

1. In what ways is The Flight of the Phoenix an example of a project? What examples can you give of ways in which the film is similar to projects that might be conducted in a work setting?
2. In what ways is The Flight of the Phoenix not like a typical work project? How do these differences make the project easier or more complex?
3. Given the overview provided, how might the team in the film have benefited from thinking about survival and construction of a new plane from the old as a project?
4. What would you have done if you were a member of the stranded team?
5. Consider the experiences of the team in The Flight of the Phoenix in the context of experiences you have had working on teams. What are some commonalities in most team situations?

These open-ended questions provide the opportunity for rich, almost unlimited discussion. Minimally, the group would be expected to integrate the introductory material with the video, thus enhancing the potential for retention of the material. Ideally, the group would engage in robust dialogue that enhances understanding of projects, project management, and teams with key learning objectives to apply to future team or project situations.

Sophisticated Audiences (Including Graduate Students)

Aspects of basic project management are quickly deduced by more sophisticated audiences, including graduate students. With these audiences, the focus of the introduction can be on developing teams, team leadership, and stages of team development (theoretically avoiding many of the problems demonstrated in the film). This group is assumed to have basic project management skills, knowledge, and ability. The PMBOK (PMI, 2000) is offered in introduction to provide a quick review for the group and allow them to use common terminology. As with the group of novice project managers, sophisticated audiences are typically offered the option of viewing the film on their own time or in a series of 50-minute classroom sessions.

After the audience has viewed the film, questions similar to those posed to the novice group are presented, with the expectation of receiving more sophisticated analysis and responses. This group is encouraged to consider similarities between the film and work teams on which they have participated, as well as lessons learned from the film that could be applied to these teams. Two additional questions are posed to this group:

1. If you were parachuted in as the project manager on the third day, what would you do to improve the management of the project?
2. What obstacles would you expect to encounter in managing the project?

Often, sophisticated groups have sound basic project management skills, but remain challenged by group dynamics and team leadership. This film presents an opportunity to discuss both concepts in depth. The first concept warranting discussion is formation of the team. In the film, circumstances limit both human and life-sustaining resources, as well as materials with which to fabricate an escape. The crash caused an extreme and dangerous situation not unlike certain critical projects. Success is achieved—the new plane is actually completed and does fly the remaining survivors to safety—but, given the approach used, safety and quality of the project

are called into question. Survivors of that first crash might well have succumbed in the desert if the new plane had also crashed.

Discussions can be steered to how a group of "inherited" people, a situation not that uncommon in companies, can be turned into a team that can accomplish a difficult task with limited resources in a short period of time. Additional discussion can be encouraged on how skills at forming a team might have led to better, faster results with less loss of life. Einstein is quoted as saying that if he had 60 minutes to solve a complex problem, he would spend the first 55 understanding it. Time spent on the front end learning about the scope of the task, other possible creative solutions for rescue, and team member skills might have expedited the process of rebuilding the plane and flying it to safety. It might also have allowed the development of a work plan that took best advantage of each person's strength. As it was, the plan was simply allowed to evolve, and not all that effectively. Good project managers can learn from the film how to not manage projects.

A second discussion topic for the sophisticated group relates to team leadership and uses of power. As the film begins, Pilot Towns is the formal leader; he is captain of the ship. Following the crash in the desert, Towns might have used his legitimate power to assume leadership. The group seems to expect Towns to assume leadership but he does not rise to the challenge. Various members of the group move in and out of the leadership role seemingly based on the needs of the moment. Cpt. Harris, the British Army officer, occasionally uses referent power by asserting himself as leader, with varying degrees of success. Dorfman, with his knowledge of the process of building a plane, exercises expert power. Dr. Renad gains the power of goodwill by caring for the wounded and understanding the emotional impact of not acting, even if the act seemed futile.

There exists an opportunity for discussion about what better leadership might have looked like in the various trying circumstances depicted in the film. What might the impacts have been if a strong leader emerged who was able to tap into the collective talent of the group and limit some of the posturing? A series of questions can lead to rich dialogue and valuable learning opportunities:

1. What might a great project leader have done in these circumstances?
2. Describe the leadership characteristics that emerged for the key characters.
3. What behaviors impeded progress and how were they handled? How does this behavior relate to your experience on project teams? How might a great team have handled these challenges?
4. What might the group have done collectively about the leadership issue? What did they do? What was the impact of their approach?
5. If you were part of this team, what would you do differently?

Each project and situation in the real world can involve people with varying gifts, talents, and personalities. Great leaders in the 21st century must be able adapt their behaviors to the needs of the situation and the group. In the film, the crew and passengers represented people with varying skills and styles who did not know each other's personalities or skills. If the project requires engaging people of different personalities and skills, the project manager must know how to manage each person to achieve the best possible results. Discussions about applications to support real teams can provide a useful link to the real world.

DISCUSSION

The VHS version of The Flight of the Phoenix (Aldrich & Blake, 1965) can be used to teach fundamentals of project management as a component of the accounting curriculum. The second-semester principles of accounting course taught at the sophomore level uses a textbook by Garrison and Noreen (2012). This textbook offers extensive coverage of basic quality terminology in Chapter 1.

This accounting course met for 50 minutes, three times a week. The curriculum includes the project management material and screening of the film near the end of the semester over three class periods. Day 1 begins with a 10-minute graphic/slide presentation, the contents of which are based on Chapter 1 of the PMBOK (PMI, 2000). A project is defined and distinguished from operations. The roles of the charter and the project manager are described and progressive elaboration is explained. To facilitate students' ability to follow the film over three class meetings, a copy of the cast list is provided (see Figure 1).

On Day 1, the film is screened from the beginning, when it is seen taking off, to the point when becomes apparent the plane is going to crash, then fast-forward to shortly after the crash. This portion of the movie shows Cpt. Harris taking the initiative to inventory the available resources and work out a water rationing plan. Screening for the first day concludes at about the 45-minute mark, with Cpt. Harris and another passenger preparing to march out, while Heinrich Dorfman announces his idea to build a new airplane. Dorfman's idea is rejected immediately by Pilot Towns, and one of the passengers, Trucker Cobb, has a mental breakdown and has to be restrained.

On Day 2, the screening begins with Lou Moran discovering that Dorfman is an aircraft designer. Dorfman outlines his tentative plan to Moran, even using the word "project" twice. Moran convinces Towns to listen to Dorfman's plan.

Dorfman explain his plan to the others. Towns, skeptical throughout the explanation, responds by arguing that starting the engine, which is rated at 2,000 horsepower, would ruin the frame and likely kill the passengers. Moran and Dr. Renad finally convince Towns that building the new airplane is more appealing than the prospect of dying in the desert.

On Day 3, in the interest of time, the next segment of the film in explained rather than shown. The survivors discover that a band of locals traveling by camel has camped nearby. The locals are unaware of the presence of the survivors. Cpt. Harris and Dr. Renad, who speaks Arabic, are chosen to circle around and ask the locals for help. The next day, the survivors discover that the locals have decamped after killing Harris and Renad and leaving their bodies behind. The remainder of the film is then screened.

A critical scene is one in which Towns decides to test the engine by starting it before construction of the new plane is completed. Dorfman explains that there are only enough resources to start the engine once, so the engine cannot be tested. A bitter argument ensues, climaxing in Dorfman stopping his work until the group is almost out of water, and then gets Towns to admit that Dorfman is in authority. They resume construction of the plane, and once the engine is started, Towns resumes command and the plane is flown to safety.

The role of project initiation is highlighted in the film. Usually the first step in project management, initiation (external authorization) in the film is problematic because no one person has formal authority over the others. Dorfman struggles to influence the group and enforce accountability while developing and refining his plan. This struggle can be used to underscore the importance of a project charter.

Tension is present throughout the film/project. The stakes in The Flight of the Phoenix are high—literally life and death—but tension is present in all types of group work. In the real world, life and death are represented by career advancement or demise.

Teamwork is critical to project success and every team member must be used effectively. In the film, only Dorfman was capable of building the plane. Only Cpt. Harris demonstrated the capability to recognize the importance of rationing water. Class discussion can be steered to the topic of quickly identifying and leveraging strengths and skills of each team member. Linking the film to work situations puts the lesson in real-life context.

Sample questions that can be used to either facilitate discussion or to test the participants' understanding of project management as it applies to the film. Not all of the questions need to be used but Question 1 is strongly suggested.

1. Would the construction of the new aircraft be considered a project or an operation? Be specific in supporting your answer.
   Answer: A project. The construction of the new plane is temporary and unique. It is built by a team and the goal is clearly defined. Dorfman even uses the word "project" twice.
2. Other than Pilot Towns and Dorfman, name another passenger who played a critical role in the survival of some of the passengers.
   Answer: Early on, Cpt. Harris brought order to a disorganized situation. Navigator Moran convinced Pilot Towns to listen to Dorfman's plan. Dr. Renad also encouraged Pilot Towns to listen to Dorfman's idea.
3. Without regard to your answer to Question 1, which passenger utilized progressive elaboration, and how was it used?
   Answer: Dorfman used progressive elaboration as he refined his planned new airplane.
4. During the semester, a constraint was defined as anything that keeps you from doing something that you want to do. Without regard to your answer to Question 1, list and briefly explain three constraints to the construction of the new aircraft.
   Answer: Food, water, rest, and unsanitary conditions are obvious constraints.
5. Without regard to your answer to Question 1, assume that the construction of the new aircraft was a project. Who was the project manager and who continuously challenged his authority?
   Answer: Dorfman was the de facto project manager and was challenged by Towns several times.

SUMMARY

The Flight of the Phoenix (Aldrich & Blake, 1965) portrays an event that occurred in the 1940s. The film is not intended to be about project management. It is a movie about human tragedy, conflict, perseverance, and survival. Nevertheless, the film can be used to encourage discussion about the field of project management. For examples of how modern project management techniques might be used in a contemporary situation such as that depicted in the film, see Figure 2. Starting with creation of the charter to identify and empower the project manager, through assigning tasks to individual members in the planning phase to encourage buy-in during execution, application of project management processes would have dramatically

increased the likelihood of successful project completion. Project management techniques are applied routinely in fields ranging from aerospace and defense to education and training, as well as government. These skills are widely recognized as adding value in organizations. Students and younger workers are accustomed to visual learning methodology. This article suggests a time- and cost-effective methodology to teach the fundamentals of project management to a wide audience by using the film The Flight of the Phoenix.

Character	Role	Actor
Frank Towns	Pilot	James Stewart
Lou Moran	Navigator	Richard Attenborough
Cpt. Harris	British Army officer	Peter Finch
Heinrich Dorfman	Designer	Hardy Krueger
Trucker Cobb	Oilfield worker	Ernest Borgnine
Crow	Passenger	Ian Bannen
Sgt. Watson	British Army enlisted man	Ronald Frasier
Dr. Renad	Physician	Christian Marquand
Standish	Accountant	Dan Duryea
Bellamy	Passenger	George Kennedy

Figure 1. Cast of characters in The Flight of the Phoenix.

Project Phase	Modern Project Management Technique
Initiation	Per PMI, a project cannot begin without a charter - the charter would identify and empower the project manager
Planning	The people doing the work would estimate the activity durations - this input facilitates team member buy-in A project schedule in a visual format would help team members understand the importance of their work Effective communication techniques should be used to articulate the chain of command and reporting relationships - sound planning dramatically increases the likelihood of a successful project
Execution	A project management information system would be utilized throughout the entire project Quality Assurance would be utilized when the project deviates from the plan - status reports are an effective means to keep team members informed
Control	Monitoring, measurement, and change control processes would be implemented to ensure that the project is *in control*
Closing	All of the above would facilitate successful project completion

Figure 2. Modern project management techniques can be applied to The Flight of the Phoenix.

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