Chapter 1

Introduction to Agile Project Management

OVER THE PAST 10 TO 15 YEARS, there has been a rapid and dramatic adoption of agile methodologies:

1. Project Management Institute (PMI)® studies concluded that from 2008 to 2013, the use of agile practices tripled.[1]
2. According to a 2013 survey conducted by VersionOne:[2]
   - 88% of the respondents say that their organizations are practicing agile development, up from 84% in 2012 and 80% in 2011.
   - Over half of the respondents (52%) are using agile software to manage the majority of their projects.
   - 88% say that they are at least “knowledgeable” about agile software development techniques, up 7% from the previous year.
3. This trend has been going on for some time. As early as 2007, a Forrester survey reported:[3]
   - “26% are already using agile and an additional 42% are aware.”
   - “Adoption of agile increased 56% from 17% in 2006, to 26% in 2007.”
   - “Awareness increased 45% from 29% in 2006, to 42% in 2007.”

These statistics indicate that agile is not a fad, it is having a significant impact on the way projects are managed, and it's definitely here to stay. This trend has a significant impact on the career direction of project managers who have come from a traditional, plan-driven project management background since there is no formal role for a project manager at the team level in an agile project.

The Chasm in Project Management Philosophies

In spite of this rapid and sustained proliferation of agile, there is still a fairly large chasm between the agile and traditional project management communities:

- There has been only a limited amount of progress on developing a more integrated approach to project management that embraces both agile and traditional plan-driven project management principles and practices.
- Many people seem to see agile and project management principles and practices as competitive approaches that are in conflict with each other, and they are essentially treated as two separate and independent domains of knowledge.
- Considerable polarization between these two communities is based in some part on myths, stereotypes, and misconceptions about what *agile* and *project management* is.

A major goal of this book is to help project managers understand the impact of agile on the project management profession and to broaden and expand their project management skills as needed to develop a more integrated approach to adapt to this new environment.

This isn't just a matter of getting another certification—it can require a major shift in thinking for many traditional project managers that will take time and experience to develop. PMI has created a new PMI-ACP® (Agile Certified Practitioner) certification, which has been very successful and is a great step in the right direction—but it doesn't go far enough, in my opinion. It doesn't test whether a project manager knows how to blend agile and traditional project management principles and practices in the right proportions to fit a given situation, and that is the real challenge that many project managers face.

A lot of the polarization that exists between the agile and traditional project management communities is rooted in some well-established stereotypes of what a *project manager* is that are based on how typical projects have been managed in the past. The role of a project manager has been so strongly associated with someone who plans and manages projects using traditional, plan-driven project management approaches that many people can't conceive of any other image of a project manager. It's time to develop a new vision of what an *agile project manager* is that goes beyond all of those traditional stereotypes and fully integrates *agile* within the overall portfolio of project management principles and practices.

It feels very similar to an evolution that took place when I worked in the quality management profession in the early 1990s. Up until that time, the primary emphasis in quality management had been on *quality control*, and inspection, and the image of a *quality manager* was heavily based on that role:

- The predominant quality management approach was based on final inspection of products prior to shipping them to the customer and rejecting any that didn't meet quality standards. It's easy to see how that approach was inefficient, because it resulted in a lot of unnecessary rework to correct problems after the fact, and it also wasn't that effective because any inspection approach is based on sampling, and it is impractical to do a 100% sample. For that reason, it can result in mediocre quality.
- A far better approach was to go upstream in the process and eliminate defects at the source by designing the process to be inherently more reliable and free of defects and build quality into the inherent design of the products. That didn't mean that the prior emphasis on quality control and inspection was obsolete and eliminated; it was just not the *only* way to manage quality and wasn't the most effective approach in all situations.

That was a gut-wrenching change for many in the quality management profession—instead of being in control of quality and being the gatekeeper with the inspection process, a good quality manager needed to become more of a coach and a consultant to influence others to build quality into the way they did their work. This changed the nature of the work dramatically for many in the quality management profession and eliminated a number of traditional quality management roles that were based on the old quality control and inspection approach. The similarity to the changes going on in the project management profession should be apparent:

- To be successful in more uncertain environments, project managers need to be able to take an adaptive approach that is appropriate to the level of uncertainty in the project and integrate quality into the process rather than relying on final acceptance testing at the end of the project to validate the product that is being produced.
- They also need to give up some of the control that has become associated with the project management profession—in some cases, they may need to become more of a coach and a consultant to influence others rather than being in absolute control of a project.

This can dramatically change the role of a project manager. In some situations, the role of a project manager as we've known it may no longer exist. For example, at a team level in an agile project, you probably won't find anyone with a title of *project manager* because the project management functions have been absorbed into other roles and are done very differently. That

doesn't mean that *project management* is no longer important, but it may cause us to dramatically rethink what project management is in a much broader context than the way we might have thought about it in the past.

The Evolution of Agile and Waterfall

You will often hear people make a comparison between agile and waterfall. Many of those discussions are polarized and position them as competitive approaches. Here's an example:[4]

> According to the 2012 CHAOS report, Agile succeeds three times more often than Waterfall. Because the use of Agile methodologies helps companies work more efficiently and deliver winning results, Agile adoption is constantly increasing.

While that statement is generally true, it's an oversimplification. There are at least two problems with that kind of statement:a

1. It makes it sound like there are only two binary, mutually exclusive choices, agile and waterfall.
2. The meaning of the words *agile* and *waterfall* are typically not well-defined and are used very loosely.

For those reasons, I prefer to avoid comparing agile to waterfall because it tends to be a very polarized discussion—I prefer to take a more objective approach that is based on a comparison between a plan-driven and an adaptive approach to project management. So let's first define both *agile* and *waterfall*, and then compare the two approaches.

Definition of waterfall

The word *waterfall* actually has a very specific meaning, but that's often not how the word is really used:

> The waterfall model is a popular version of the systems development life cycle model for software engineering. Often considered the classic approach to the systems development life cycle, the waterfall model describes a development method that is linear and sequential. Waterfall development has distinct goals for each phase of development. Imagine a waterfall on the cliff of a steep mountain. Once the water has flowed over the edge of the cliff and has begun its journey down the side of the mountain, it cannot turn back. It is the same with waterfall development. Once a phase of development is completed, the development proceeds to the next phase and there is no turning back.[5]

Another aspect to the waterfall model is that it is plan-driven; it attempts to define and document detailed requirements and a plan for the entire project prior to starting the project. When someone makes a statement comparing waterfall to agile, the word *waterfall* is often used very loosely to refer to any kind of plan-driven methodology, and that's not really a very accurate and meaningful comparison. In some other comparisons like this, the word *waterfall* refers to a general style of project management that obsessively emphasizes predictability and control over agility, and that's just bad project management.

Definition of agile

The meaning of the word *agile* in this kind of comparison is also somewhat elusive because it has taken on some very strong connotations in actual usage. At a project level, at least in the United States, the word *agile* has taken on a specific connotation associated with using the Scrum methodology on software development projects:

> Scrum is an agile software development model based on multiple small teams working in an intensive and interdependent manner. The term is named for the scrum (or scrummage) formation in rugby, which is used to restart the game after an event that causes play to stop, such as an infringement. Scrum employs real-time decision-making processes based on actual events and information.[6]

That definition has evolved over recent years as Scrum has become somewhat of a de-facto standard for agile projects; however, the original definition of *agile* conceived in the *Manifesto*

for Agile Software Development, published in 2001, was much broader than that. Better known as the Agile Manifesto, it laid out some simple and general principles and values that can apply to any kind of project (not just software development) (See Chapter 2).

Comparison of plan-driven and adaptive approaches

Traditional, plan-driven project management is a style of project management that is applied to projects where the requirements and plan for completing the project can be defined to some extent prior to implementing the project. However, *plan-driven* is a relative term, and you won't find many projects that start out with an absolutely rigid plan that is not expected to change at all.

In contrast, an adaptive style of project management starts the implementation of a project with a less well-defined plan of how the project will be implemented and recognizes that the requirements and plan for the project are expected to evolve as the project progresses. *Adaptive* is also a relative term; you won't find many projects that have no plan whatsoever of how the project will be done.

The important point is that the terms *plan-driven* and *adaptive* are relative—they are not discrete, binary, mutually exclusive alternatives. They should imply a continuous range of approaches with different levels of upfront planning.

Saying “Agile is better than waterfall,” is like saying, “A car is better than a boat.” Agile and waterfall are different kinds of methodologies designed for different kinds of projects. The problem is not so much that waterfall or agile are inherently good or bad; the problem comes about when those methodologies are misused and people try to use a single methodology (whatever it might be) for all projects. Using a “one size fits all” strategy to applying either waterfall (plan-driven) or agile (adaptive) approaches to all projects is not likely to yield optimum results.

In my opinion, being able to objectively understand the difference between a plan-driven approach and a more adaptive approach—as well as the principles behind those approaches at a deeper level—is probably one of the most important skills an agile project manager needs to have. An agile project manager needs to recognize the following:

- *There is a broad range of alternative approaches between being plan-driven and being adaptive*. The agile project manager must choose the right level of upfront planning to be applied to a project, based on the level of uncertainty and other factors in the project.

- *It takes some skill to make the right choice*. There is nothing inherently wrong with either of those approaches (adaptive or plan-driven). The problem comes about when people try to force-fit a project into one of these approaches rather than selecting and tailoring the approach to fit the project. For example, if I were to set out to try to find a cure for cancer and I attempted to apply a highly plan-driven approach to that project, the results would probably be dismal.

The important point is that a heavily plan-driven approach (what some loosely refer to as *waterfall*) is not the only way to successfully manage a project. In many projects, a good approach is to use an adaptive approach to start the design effort without fully-defined and detailed requirements and perhaps prototype something quickly. Then user feedback can be added to further refine the design as the project progresses. With a more adaptive approach:

- *The elements of the approach are much more concurrent than sequential*. Instead of doing the entire design and then turning it over to quality assurance (QA) for testing, the design is done in small chunks called *iterations* or *sprints* that are typically two to four weeks long. During that time, developers and testers work collaboratively to design and test the software during each sprint.
- *The customer also provides detailed inputs on the design during each sprint*. The customer accepts the results of each sprint at the end of each two- to four-week period rather than waiting for user acceptance testing (UAT) at the end of the project. That has the advantage of finding and resolving any problems quickly and early in the project.

One primary advantage of a more adaptive approach is that the project startup is accelerated because less time is spent upfront in attempting to define detailed requirements. In addition, engaging the user more directly in the design process is more likely to produce an outcome that provides the necessary business value and really meets the user needs.

An adaptive approach maximizes the business value to the customer because the customer is directly engaged with the design team as the project progresses, but it is worse for predictability and control because the customer can make changes as the project progresses. In an agile project, change is the norm rather than the exception. However, this is not an “all-or-nothing” proposition to have total control or no control at all. There are many ways to achieve the right balance of

control versus agility. For example, prior to the start of a project, the high-level requirements might be defined and stabilized, and then only the more detailed requirements need to be further elaborated as the project progresses.

The Evolution of the Project Management Profession

Many of the techniques associated with project management that are in use today haven't changed significantly since the 1950s and 1960s. I believe that we are on the verge of a major transformation of the project management profession that will cause us to redefine project management in a much broader context that includes both agile and traditional, plan-driven project management.

The early history of project management

In order to understand this transition and to put it in perspective, it is useful to understand how the project management profession has evolved over the years and how we got to where we are today. Project management has been practiced for many years in one way or another—I'm sure that there was some kind of “project management” approach for building the great pyramids of Egypt or the Great Wall of China or other similar large efforts many years ago, but it probably wasn't even thought of as project management in those days. They didn't have Gantt charts and Pert charts and other sophisticated project planning and management tools, because those things weren't even invented until the twentieth century.

The Industrial Revolution created the need for a more disciplined approach to project management, and a well-defined body of knowledge associated with project management began to evolve:

In the late 19th century, in the United States, large-scale government projects were the impetus for making important decisions that became the basis for project management methodology such as the transcontinental railroad, which began construction in the 1860s. Suddenly, business leaders found themselves faced with the daunting task of organizing the manual labor of thousands of workers and the processing and assembly of unprecedented quantities of raw material.

Near the turn of the century, Frederick Taylor began his detailed studies of work. He applied scientific reasoning to work by showing that labor can be analyzed and improved by focusing on its elementary parts that introduced the concept of working more efficiently, rather than working harder and longer.

Taylor's associate, Henry Gantt, studied in great detail the order of operations in work and is most famous for developing the Gantt [c]hart in the 1910s.[7]

World War II brought about the need for more large-scale project management for organizing very large projects like the Manhattan project; however, it wasn't until the 1950s and 1960s, that it became apparent that a much more well-defined body of knowledge and a disciplined approach were needed to successfully manage some of the large and complex projects that were evolving at that time, which led to the following:

- The Program Evaluation and Review Technique or PERT was developed by Booz-Allen & Hamilton as part of the US Navy's (in conjunction with the Lockheed Corporation) Polaris missile submarine program."
- The Critical Path Method (CPM) was developed in a joint venture between DuPont Corporation and Remington Rand Corporation for managing plant maintenance projects.
- The Project Management Institute (PMI) was founded in 1969.[8]

Many people probably assume that the project management profession is now reaching a stage of maturity and stabilizing, but I believe that we have only seen the beginning, and project management, as we've known it, will continue to grow in entirely new directions.

Transformation of the project management profession

Sometimes we get so immersed in day-to-day activities that we don't take time to step back and see some fundamental changes that are going on around us. It seems clear to me that the project management profession, as we know it, is going to go through such a major transformation. The exact nature of that transformation isn't completely clear as it is still evolving; however, it does seem likely that it will cause us to rethink many of the things we have taken for granted in the project management profession for a long time in a much broader perspective. It feels very similar to the evolution that has taken place in other technology areas and disciplines. For example, there is a strong similarity to the evolution from classical physics to modern physics.

> "By the close of the 19th century, the study of physics was widely thought to be essentially complete, with the exception of only a few 'loose ends'—minor unsolved problems to be dealt with."[9]

Up until that time, the study of physics had been heavily dominated by Newtonian physics, which defines some fundamental laws of how the universe behaves such as Newton's laws of motion. These fundamental laws have been taken for granted in the world of physics for many years, even though we didn't fully understand why things in the universe behaved as they did. As modern physics has evolved in the twentieth century based on quantum mechanics and relativity, we began to develop a deeper understanding of the real dynamics behind these laws and we began to understand that the universe is not as simple and deterministic as we might have thought it was.

The transition from classical, Newtonian physics to a more complete and more dynamic model based on quantum mechanics provided a deeper understanding of the forces and principles behind those laws as well as the limitations in those laws and when and where they are really applicable. That deeper understanding didn't invalidate the laws of Newtonian physics in most situations—"on an 'everyday' scale; that is, situations in which energies are large enough to permit one to neglect quantum effects, but small enough to neglect relativistic effects."[10]

The similarity to the transition in the project management profession should be apparent—we're moving from a world in which we had the impression that the behavior of the universe was highly predictable and controllable and totally subject to some well-defined rules to a world that is much more dynamic, much more probabilistic, and much less predictable.

What's driving this change, and why now?

You might ask, “Why is it becoming so essential for the project management profession to make a change at this particular point in time? There are several major factors that will force us to rethink the concept of project management:

1. *The nature of projects is changing*. The modern concepts of project management were developed as result of big projects like the transcontinental railroad…Today, we have new industries and a much broader range of projects such as web development, e-commerce, large IT projects, etc., which weren't common before the mid-nineties. It is becoming increasingly apparent that applying a “one size fits all” approach to such a broad range of projects will not have optimum results.
2. *Technology is rapidly changing*. Figure 1.1 shows how the adoption rate of new technologies has changed over the past century. Project management approaches that worked in the 1950s and 1960s must be reexamined to adapt to the current fast pace of technology adoption.

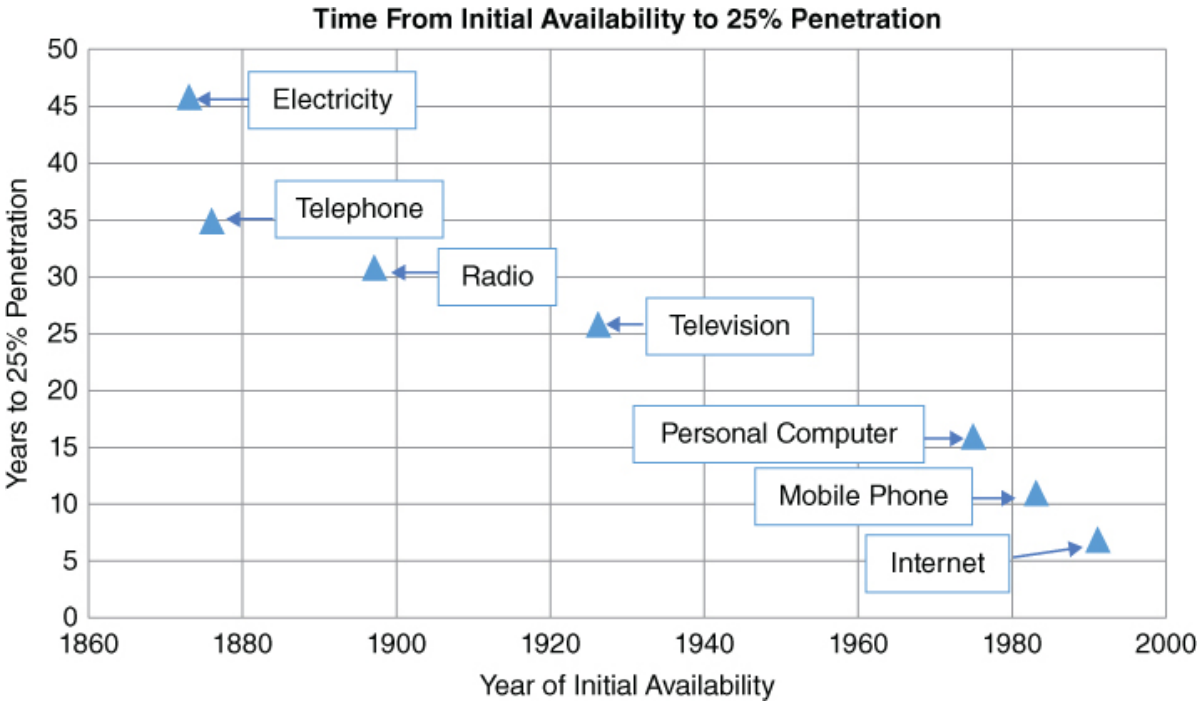

Figure 1.1 Adoption rates of new technologies

Created with data from singularity.com

A similar transformation took place in the quality management profession in the 1980s and early 1990s. At that time, the Japanese auto industry was demonstrating huge improvements in quality of products that made conventional quality management methods based primarily on quality

control and inspection very inadequate. They forced people to rethink the whole strategy and approach for doing quality management. Without the leadership of people like W. Edwards Deming and the significant improvements in quality that were demonstrated in the automotive industry, the transformation of quality management might never have happened. What started primarily in the automotive industry has now become a more modern approach to quality management that is widely used in all industries. A similar thing is happening with agile and traditional project management today:

- The leadership of W. Edwards Deming in establishing a total quality management (TQM) philosophy can be compared to the thought leadership behind the Agile Manifesto in 2001.
- The broad-based adoption of TQM starting in the automotive industry and eventually spreading to many other industries can be compared to how agile has started out in software development today and is now beginning to spread to other areas.

Other researchers have come to a similar conclusion regarding this; Manfred Saynish published his findings of a research project in *Project Management Journal*:

> Traditional Project Management. . . is based mainly on a mono-causal, non-dynamic, linear structure and a discrete view of human nature and societies and their perceptions knowledge and actions. It works on the basis of reductionist thinking and on the Cartesian/Newtonian concept of causality (the mechanistic science).[11]

The article proposes a new approach to project management called “PM-2” where traditional project management will play an active and important role but will be “extended to consider dynamic, nonlinear, multi-causal structures and processes as well as the principles of self-organization, evolution, and networking.” The article goes on to say:

> For an effective attainment of project goals at a defined finishing point in time, we need the linear processes and Cartesian causality and the Newtonian logic from Traditional project management. But evolutionary and self-organizational-based management methods are necessary to master complex and uncertain situations on the way to the defined finishing point in time for a project. A well-balanced interaction of traditional project management and the evolutionary and self-organizational principles is the message of the Project Management Second Order.[12]

I agree with that view—we are on the verge of a new generation of project management that will cause us to rethink many of the accepted notions of what "project management is." It requires blending traditional project management principles and practices with a much more empirical and evolutionary approach to deal with the uncertain, dynamic, and fast-paced environment we live in today.

Agile Project Management Benefits

I am a strong believer in agile, and there are some very significant benefits of an agile approach in many situations. However, many proponents of agile oversell the benefits and sometimes position agile as a panacea that should be used for all projects. The real benefit to a typical project manager of developing an agile project management approach is *not* in throwing away any notion of using a plan-driven approach, converting to agile, and using a totally agile approach for all projects. Rather, the benefit results from recognizing that a traditional, plan-driven approach is not the best way to manage *all* projects and thus learning to blend adaptive/agile and plan-driven principles and practices in the right proportions to fit a given situation.

Even if a project manager never uses a *fully* agile approach, I believe that knowledge of agile concepts and principles will make him/her a better project manager. It's really a matter of learning a broader range of approaches (adding more tools to your tool box) and developing a more adaptive project management approach (developing more skill in using those tools). In my previous books, I used the analogy of a project manager as a "cook" and the project manager as a "chef" (with credit to Bob Wysocki):[13]

- A good *cook* might have the ability to create some very good meals, but those dishes might be limited to a repertoire of standard dishes, and his/her knowledge of how to prepare those meals might be primarily based on following some predefined recipes out of a cookbook.
- A *chef*, on the other hand, typically has a far greater ability to prepare a much broader range of more sophisticated dishes using much more exotic ingredients in some cases. The chef's knowledge of how to prepare those meals is not limited to predefined recipes, and in many cases, a chef will create entirely new and innovative recipes for a given situation. The best chefs are not limited to a single cuisine and are capable of combining dishes from entirely different kinds of cuisine.

I think that sums up the transformation that needs to take place—we need to develop more project managers who are “chefs” rather than “cooks.”

Here are five specific benefits of developing an agile project management approach:

1. *Increased focus on business outcomes*. Many people think that the primary benefit of an agile project is just getting it done faster, but that is not always the case. The primary emphasis in an agile project is really to deliver value in the form of very successful business outcomes by taking an adaptive approach to maximize the value that is delivered. That doesn't always result in the fastest delivery times. In some cases, it may require some experimentation and trial-and-error prototyping to find an optimum solution—that may or may not be the quickest way to get it done, but it should result in a better product in the end.
2. *Reduced time to market*. Time to market is, of course, an important consideration, and agile accomplishes that in a couple of ways:
    - By reducing the startup time required for projects as a result of simplifying some of the requirements definition practices
    - By improving the efficiency of the overall project and delivering functionality incrementally as much as possible
    - By focusing on simplicity and eliminating non–value-added work
3. *Higher productivity and lower costs*. Agile can also result in higher productivity and lower costs by eliminating unnecessary overhead and bottlenecks and doing work concurrently rather than sequentially.

4. *Higher quality*. A very important benefit of agile is higher quality. In a traditional waterfall project, *quality* is sequential and is often perceived as a separate effort that is the responsibility of the quality assurance (QA) department. The developers many times develop the software and then "toss it over the wall" to be tested by QA. In an agile project, the team, as a whole (which includes QA testers) jointly owns responsibility for building quality into the design of the products that they produce—it's not someone else's responsibility. The development effort is broken up into short iterations called *sprints* that are typically two to four weeks in length. There is an emphasis on producing a *shippable product* at the end of every sprint, which means that quality testing must be more integrated with development and cannot be put off indefinitely.

   In the traditional environment, the developers may pass software over to QA that has not been fully tested, expecting QA to test it and find any bugs. In an agile environment, code is not considered "done" until it has been tested and proven to be working without defects.

5. *Organizational effectiveness*. Finally, a very important benefit of agile is a more effective organization with higher morale:

   - People at all levels are motivated and empowered to do their work and take pride in doing it well because the environment is built on solid values, including respect for people.
   - All parts of the organization work together more collaboratively in a spirit of partnership toward common goals.

Summary of Key Points

1. *Closing the chasm*. There has been a widespread and rapid adoption of agile methodologies over the last 10 to 15 years; however, our progress in developing an integrated approach to project management that embraces agile as well as traditional project management principles and practices has been somewhat limited. To make progress in that direction, we need to get past a number of well-established stereotypes and develop a much broader vision of what project management is.

2. *Comparison of agile versus waterfall*. The typical discussion that compares agile and waterfall as if they were two discrete, mutually exclusive, binary choices oversimplifies what should be more accurately thought of as a range of adaptive and plan-driven approaches. The agile versus waterfall comparison has also created an impression that the approaches are

competitive, and that has created some polarization. In fact, adaptive and plan-driven approaches really should be thought of as much more complementary to each other.

3. *Transformation of the project management profession*. The project management profession is at a major turning point in its history. The project management profession has developed over a number of years into a well-planned and disciplined approach to how projects are managed in reaction to the need for managing very large and complex projects that evolved in the early 1950s and 1960s. That approach has worked well for projects that can be heavily plan-driven; however, it has serious limitations in highly uncertain and rapidly changing environments that are difficult or impractical to plan.
4. *Agile project management benefits*. Developing a more adaptive approach to project management and tailoring the approach to fit the project will generally result in a number of benefits. The benefits come from matching the approach to the project rather than always using a plan-driven approach for all projects. These benefits are not limited only to agile projects—even if a project manager is never involved in an Agile project at all, developing a broader and deeper knowledge of both adaptive and plan-driven principles and practices is likely to significantly improve a project manager's skills for many different projects by developing a more adaptive approach that can be optimized for the nature of the project.

Discussion Topics

1. Closing the Chasm

   Have you observed the “chasm” between the agile and traditional project management communities? How does it manifest itself? What is the impact? What needs to be done to “close the chasm”?

2. Agile versus Waterfall

   Research the usage of the terms *agile* and *waterfall*. Identify and discuss how this comparison is often misleading. Explain the difference between an *adaptive* and *plan-driven* approach and how that helps to provide a more objective frame of reference.

3. Transformation of the Project Management Profession

How do you see the transformation that is going on in the project management profession? Do you think that there is a significant change, and if so, what impact will it have on the project management profession as a whole? What needs to be done to make this transformation happen?

4. Agile Project Management Benefits

   What do you think are the most important benefits of developing a more adaptive/agile approach? How would it affect the way you manage projects?

5. Balancing Agility and Control

   How would you go about determining the appropriate balance of agility and control for a project? What factors would you consider, and why? Provide an example of a real-world project and discuss how you might do it differently based on these factors.

6. Agile Benefits

   What do you think are the most important benefits of an agile approach to some typical projects? Discuss a real-world example of how an organization might have benefited from adopting a more agile approach.

7. Project Management Career Direction

   How do you think agile affects the career direction of project managers? What impact do you think it might have on your own career? What do you think you might have to do differently as a result of agile?

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[8] Ibid.

[9] Physics”, http://www.conservapedia.com/Physics

[10] “Physics”, http://www.conservapedia.com/Physics

[11] Manfred Saynish, “Mastering Complexity and Changes in Projects, Economy, and Society via Project Management Second Order (PM-2),” *Project Management Journal* 41, no. 5 (Dec. 2010).

[12] Ibid.

[13] Cobb, Charles, Making Sense of Agile Project Management, Wiley, 2003, p 96