

# Introduction to Agile Project Management

Learn How to Apply Project Management Practices in an Agile Environment



Choosing the Right Approach

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## Choosing the Right Approach

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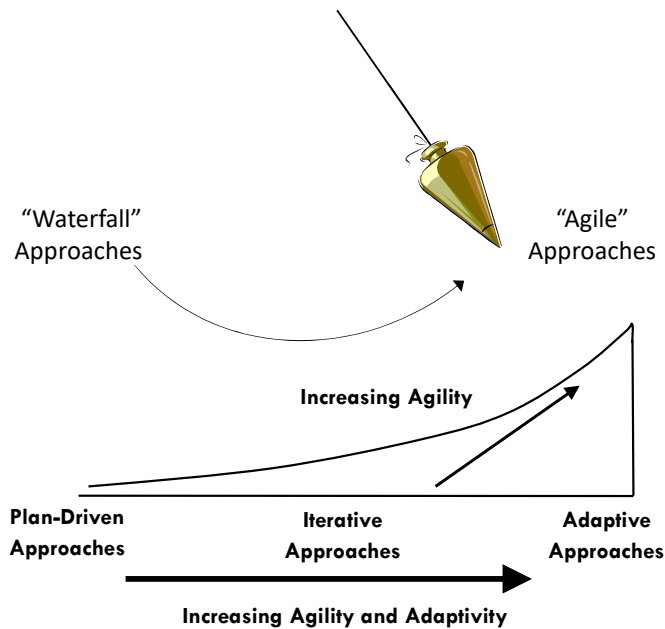
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This lecture is about choosing the right approach to fit a project. Many times this is positioned as a choice between Agile and Waterfall but it's really not a binary choice at all. Instead of force fitting a project to one of those extremes, the right solution is to fit the approach to the project. That requires a lot more skill.

I want to start by reviewing the examples I gave in the Agile versus Waterfall course and then go into some more detail about how to choose the right approach.

# The Pendulum Effect



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Let's first do a quick review of some of the information I talked about in the Agile versus Waterfall course...

There has been a pendulum effect in this area for a number of years...

Agile started out as somewhat of a revolution by developers against project management controls associated with traditional Waterfall methodologies that were perceived to be very cumbersome and bureaucratic.

There is certainly some truth in that; but, in some cases, the pendulum has swung a little too far to the other extreme to the extent that some people in the Agile community feel that imposing any kind of management controls on an Agile project is inconsistent with an Agile development approach.

Over the past few years, as Agile has matured; however, that pendulum has started to swing back towards the middle of those extremes and many people have begun to recognize that it's not a binary, "either or" decision to be Agile or "Waterfall" and it's possible to create a hybrid approach that offers the right balance of a plan-driven approach and an adaptive approach to fit a given situation.

# Agile is Not a Solution to Every Problem

The Level of Uncertainty in a Project is a major factor in choosing the right approach:



Plan-Driven Approach

Projects that have relatively low levels of uncertainty generally call for a more plan-driven approach



Agile Approach

Projects that have a lot of uncertainty call for a more Agile approach

**The right solution is to fit the approach to the nature of the project  
A major factor in choosing the right approach is the level of uncertainty**

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One of the first things we need to recognize is that Agile is not a solution to every problem. One of the major factors in choosing an approach is the level of uncertainty in the requirements for the project.

- Projects that have relatively low levels of uncertainty that make it possible to define requirements prior to the start of the project and require some level of predictability generally call for a more plan-driven approach
- Some things that have a lot of uncertainty call for a more Agile approach

The key point is that you should fit the approach to the nature of the project and a major factor in choosing the right approach is the level of uncertainty associated with the project.

Let's look at an example...

# Agile is Not a Solution to Every Problem – Example



## Building a Bridge Across a River

### Why is an Agile Approach NOT the best choice?

Significant amount of cost and rework if the design were to change significantly in the middle

The integrity and reliability of the bridge design requires a consistent and well-planned approach

Whoever is paying for the bridge probably wants to know the cost and schedule for completing it

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The example I used in the Learning the Truth About Agile versus Waterfall for a plan-driven approach was building a bridge across a river – as I mentioned if we were building a bridge across a river, it would probably be ridiculous to say “We’ll build the first span of the bridge, see how that comes out and then decide how we will build the remaining spans”. It should be very apparent that an Agile approach makes no sense for this situation – let’s look in a little more detail at some of the reasons why that is the case:

First, if the design of the bridge went through a significant change in the middle of the project to build the bridge, the cost and difficulty of the rework required to change the design at that point might be very significant.

Second, the integrity and reliability of the bridge design depends on using a well-thought-out, well-planned, and consistent approach for the whole bridge. It would probably make no sense to build half of the bridge one way and build the other half another way.

Finally, whoever is paying for the construction of the bridge is probably going to want a somewhat reliable estimate of the costs and schedule for completing it before committing to the construction. No one is going to sign a blank check to build a bridge without some idea of what its going to cost.

## But What If There Were Some Uncertainty Involved?



Even the most obvious examples are not always totally black-and-white.

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However, even this situation is not always necessarily this clear and black-and-white. If there is some level of uncertainty or risk associated with building the bridge, you might have to develop somewhat of an adaptive approach. Suppose, for example, that the bridge required some new technology that had never been used before...you probably would want to try out that technology on a smaller scale before committing to the construction of the whole bridge.

The key thing to recognize is that even the most obvious examples are not always totally black-and-white and even the most predictable situations have some level of uncertainty associated with them that shouldn't be overlooked.

# Plan-driven is Not a Solution to Every Problem Either

Developing a Cure  
for Cancer



## Why is a Plan-driven Approach NOT the best choice?

The level of uncertainty in the project makes it impossible to develop a detailed plan

The project would get hopelessly bogged down in the startup phase and never get started

The need to control the costs and schedules is far less important than finding a solution

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A plan-driven approach is also not a solution to every problem. The example I used in the Learning the Truth About Agile versus Waterfall course was finding a cure for cancer. Lets examine a few reasons why using a plan-driven approach for that kind of project would probably make no sense:

First, the level of uncertainty in the project would make it impossible to develop a detailed plan. No one really knows what it will take to find a cure for cancer and it would take a lot of research as well as a lot of trial-and-error to find a solution with no guarantee of finding a solution at all in any reasonable amount of time. Attempting to develop a plan for that kind of effort would be futile.

If we did try to develop a plan, we would probably waste an enormous amount of time trying to plan something that is impossible to plan when the best way to get started is to lay out a general plan based on whatever we do know and some possible assumptions and just start taking an iterative, trial-and-error approach to finding a solution.

Finally, the need in this situation to control the costs and schedules of the effort is insignificant in proportion to the value and importance of finding a cure. So there is not much value in developing a detailed plan. Everyone knows that the effort is not going to be easy and is likely to require a significant amount of money and time and there is also a risk that it may not be successful at all for a long time. The important thing is that all of the stakeholders that are sponsoring the effort have a common understanding of that so that their expectations are properly set.

## But Shouldn't We Take Advantage of What We Already Know?



Even in the most extreme case, we're rarely starting from scratch knowing absolutely nothing

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But even in the extreme case of finding a cure for cancer, there is a lot of knowledge that has already been developed that we certainly should take advantage of – it wouldn't make sense to start from scratch and ignore whatever work had already been done in this area even if it isn't totally conclusive.

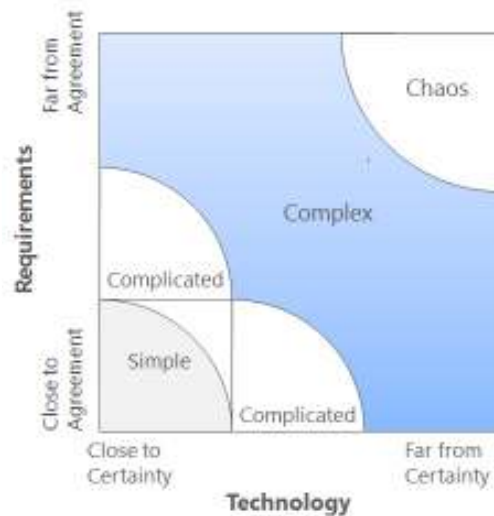
Rather than blindly starting to look for a cure for cancer, you would first take stock of what is already known and perhaps develop some hypotheses to prove or disprove. You could develop a rough plan of direction based on that information. It certainly wouldn't be a totally rigid plan but it would provide some general direction to the effort rather than wandering aimlessly looking for a cure without any direction at all.

Again, the key thing to note is that even in an extreme case like this, this is not a totally black-and-white choice between two extremes. You rarely will start a project from scratch where you know absolutely nothing.



# Stacey Complexity Model

How well-understood and well-defined are the project's goals and requirements?



How well-understood is the technology and solution for solving the problem?

<http://www.portlandwebworks.com/blog/which-project-delivery-approach-right-my-project>

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An interesting model that is useful for understanding how to handle different types of projects is what is called the Stacey Complexity Model created by Dr. Ralph Stacey. It provides a model for understanding the level of complexity in a project in two dimensions:

- The first dimension is the level of agreement on the requirements – how well-defined and understood are the project requirements?
- The second dimension is the level of certainty associated with the technology – how well-understood is the technology and the solution for solving the problem?

# Requirements Uncertainty

“For a new software system, the requirements will not be completely known until after the users have used it”

Humphrey's Requirements Uncertainty Principle  
W. S. Humphrey, [A Discipline for Software Engineering](#): Addison-Wesley, 1995

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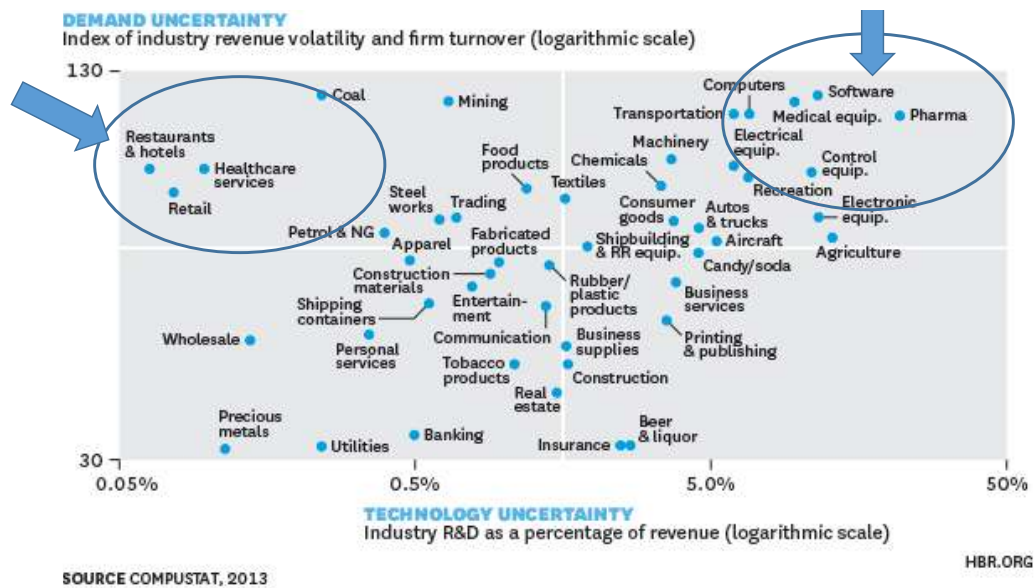
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Of these two dimensions, the one that is probably the most difficult to evaluate is the level of certainty or uncertainty associated with the requirements. There are many situations where the user of the solution may think they know what they want but until you put something in front of them for evaluation you're never really completely sure.

A very famous principle in this area is Humphrey's Requirements Uncertainty Principle that says “For a new software system, the requirements will not be completely known until after the users have used it”

The risk and uncertainty is particularly high for new products that are new to the market or new application areas that haven't been implemented before. And new technologies are enabling many new applications that have never been done before. That is where the interaction of technology uncertainty and requirements uncertainty is at its highest level.

# Demand and Technological Uncertainty by Industry

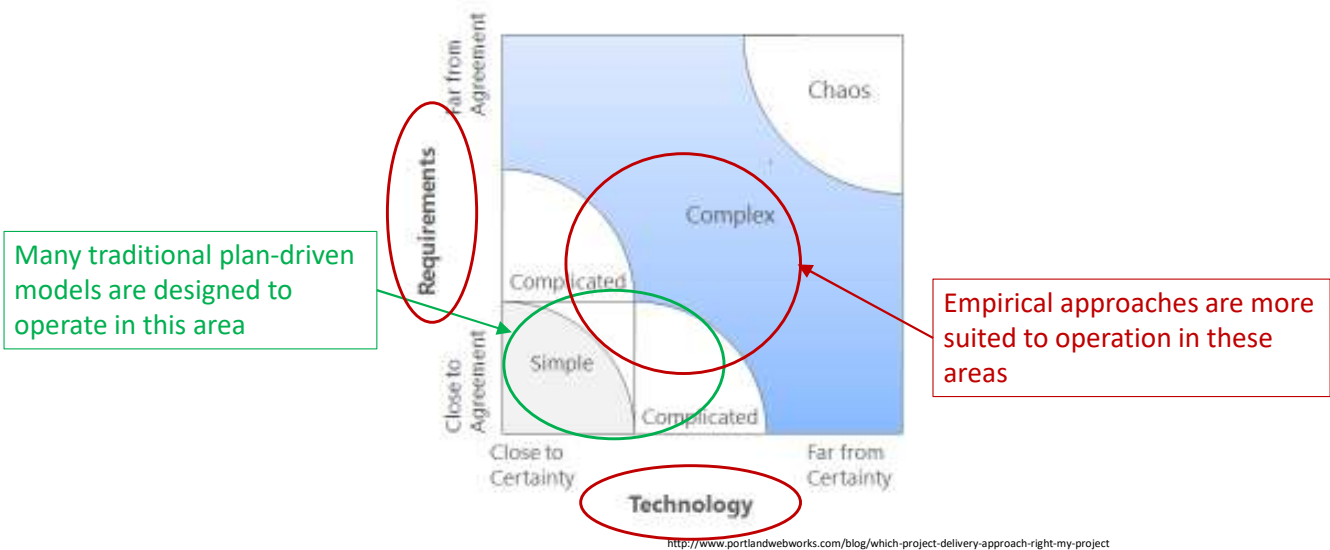


This diagram shows how requirements uncertainty (or what is sometimes known as demand uncertainty) and technology uncertainty can vary by industry.

Let's look at the demand uncertainty axis as an example – notice at the top of this axis are restaurants and hotels which can be very volatile and subject to elusive consumer preferences. How many restaurants have you known that tried to implement a new concept and lasted less than a year? There are many of them. Retail is another area that is very volatile – think of all the retail chains such as Radio Shack, Circuit City, Linens and Things, and many others that have closed huge numbers of stores in response to low consumer demand and competition from other stores who did a better job of identifying and understanding consumer preferences.

Now let's look at technology uncertainty. Notice that areas that have a high level of technology uncertainty many times also have a high level of demand uncertainty. They go hand-in-hand – whenever new technology is introduced that enables new applications and new ways of doing things, there is naturally some uncertainty about how consumers will adopt the new technology and that is where the overall uncertainty is the highest.

# How Do Most Projects Fit in This Model?



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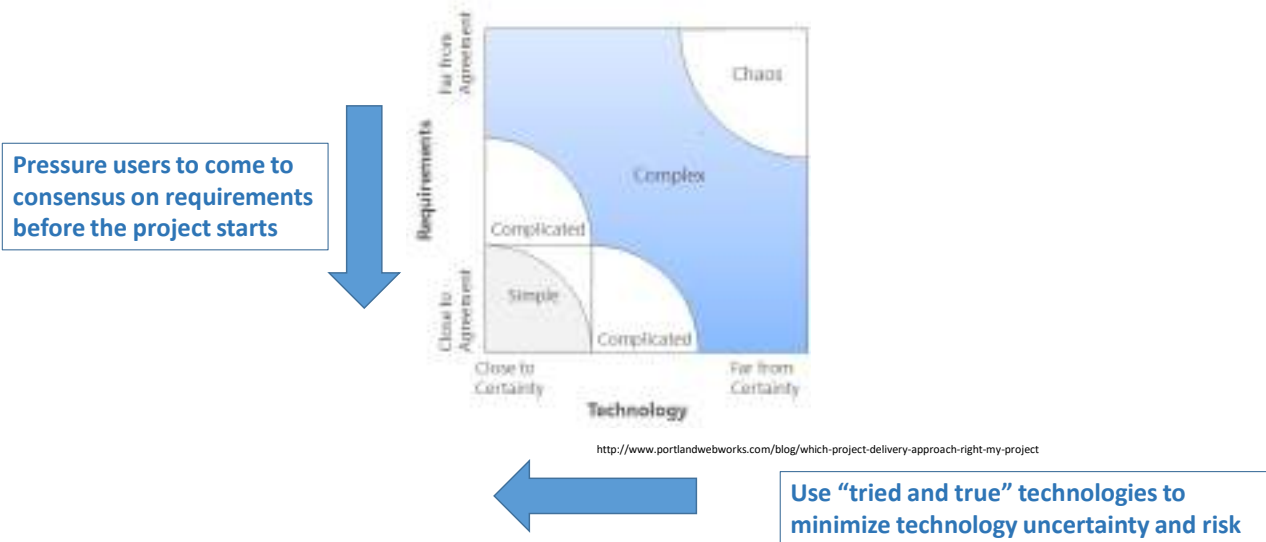
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Most plan-driven models are designed to operate in a relatively small area. You have agreement on what the desired outcome is and you are relatively certain of how to get there. In a plan driven project a key part of the initial planning is to attempt to reduce the level of uncertainty in the project to operate in this area. However, there are some significant potential problems with that approach:

- By forcing the users and stakeholders to come to agreement on what the requirements should be prematurely, it may be overlooking a level of uncertainty in the requirements that should take more time to resolve and come to consensus on in order to reach a more optimum solution.
- By selecting a low-risk technology approach that has a higher level of certainty for implementation, it may be avoiding taking a risk on other approaches that could potentially provide a much more significant benefit.

Empirical approaches, on the other hand, are more adaptable to both uncertain requirements and uncertain technology and, for that reason, are more suited to more complex projects.

# Forcing a Project into a Plan-driven Model



Management of uncertainty should be a key area of focus in any project.

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Because a plan-driven approach is not well-designed to deal with high levels of uncertainty, there are two problems that commonly take place in order to fit a project into a plan-driven model.

- First, there may be a lot of pressure on users to come to consensus on the requirements before the project starts and before they have even seen the solution.
- Second, from a technology perspective, there may be a tendency to use "tried and true" technologies that have been well-proven and have lower risks associated with them

It should be easy to see how both of those tendencies could lead to a less than optimum solution

- Pressuring users to come to consensus prematurely on requirements is likely to hide major areas of uncertainty that should be best to acknowledge and recognize in order to optimize the solution
- Limiting the project to using "tried and true" technologies may be very limiting and might result in producing a solution that is obsolete relatively quickly after it is introduced

Management of uncertainty should be a key area of focus in any project. Rather than attempting to artificially force the level of uncertainty to a very low level, it is many times better to openly acknowledge the uncertainty in a project and use a project model that is more optimized for dealing with uncertainty.

# Important Guidelines

A pure plan-driven approach can be very limiting

An Agile approach or a hybrid Agile approach has the potential to cover a much broader range of situations

If you're not sure of the level of uncertainty, it's best to use an Agile or hybrid Agile approach

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Here are some important guidelines that we can summarize from this:

1. First, a pure plan-driven approach can be very limiting because it is not very adaptable to higher levels of uncertainty
  - For that reason, use a pure plan-driven approach only for situations where the level of uncertainty is low
  - Be sure to objectively evaluate the level of uncertainty and don't overlook major areas of uncertainty (either requirements or technology)
2. Second, an Agile approach or a hybrid Agile approach has the potential to cover a much broader range of situations because it is much more adaptable to higher levels of uncertainty

Finally, if you're not sure of the level of uncertainty, it's best to use an Agile or hybrid Agile approach to keep your options open

# Questions to Ask

## Requirements

How well-defined are the project's goals and requirements?

Are they really understood and agreed-upon by all the project stakeholders?

What level of confidence is associated with that?

## Technology

How clear is the approach for implementing the solution?

What's the level of risk and uncertainty associated with implementing the solution?

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One of the most common mistakes that is made in project management is to underestimate the complexity of a project. For that reason, it's very important to make a good objective assessment of the level of complexity in a project. Here are some potential questions to ask to determine what kind of approach is most appropriate for a given project:

### 1. Requirements

- How well-defined are the project's goals and requirements?
- Are they really understood and agreed-upon by all the project stakeholders?
- What level of confidence is associated with that and how likely are they to change?

### 2. Technology

- How clear is the approach for implementing the solution?
- What's the level of risk and uncertainty associated with implementing the solution?

# Impact on the Future of Project Management

It can take a lot more skill and judgment to fit the approach to the problem

It Requires:

Skill in objectively assessing the level of complexity in the situation

Knowledge of a broader range of methodologies

A deeper understanding of the principles behind the methodologies

**A hybrid Agile approach can handle a very broad range of situations**

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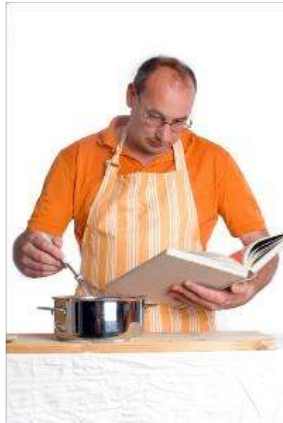
It should be apparent that it can require a lot more skill to fit an approach to a problem as opposed to force-fitting a problem to some kind of canned predefined methodology whatever it might be (Agile or plan-driven) – it requires

- Skill in objectively assessing the level of complexity in the situation
- Knowledge of a broader range of methodologies, as well as
- A deeper understanding of the principles behind the methodologies to know how to blend them together to fit a given situation

To make this a little easier, I'm going to teach you how to use a hybrid approach in this course that can be adapted to a very broad range of situations



## Impact on the Future of Project Management:



**“The agile movement forces project managers to consider a much broader range of ‘recipes’ and ‘ingredients’ to ‘cook’ with and requires a much more customized and tailored approach.”**

*ORIGINAL COOK VS. CHEF ANALOGY FROM BOB WYSOCKI*

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In my book, I use the analogy of a Project Manager as a cook versus a Project Manager as a chef...a “cook” knows how to prepare a limited number of simple recipes by the book. A “chef” knows how to prepare a broader range of more exotic recipes, his/her knowledge is not limited to pre-defined recipes and he/she will often create new and innovative recipes for a given situation. That’s the challenge for project managers today – to become chefs rather than cooks and that’s the challenge this course is designed to help you address.

**NEXT LECTURE...**  
**VALUE-DRIVEN DELIVERY**  
**OVERVIEW**

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In the next lecture, we're going to discuss an overview of "Value-driven Delivery"