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## Flexible Project Management: Creating a Flexible Environment

Third of four articles in a series on flexible project management

*By Preston G. Smith and Jeff Oltmann*

### Broadening Agile

**A**gile software development—and agile project management—is a popular topic among project managers today, as it allows them to deal with the inevitable changes that occur in the middle of a project. But how do agile techniques apply to non-software projects? This is the third article in a series that explores that question.

Agile techniques are ideally suited to software development projects. But if your project is in another domain, agile is likely to be frustrating, because agile software techniques exploit characteristics, such as object technologies, that are unique to the software medium. Agile software techniques do not translate directly to other domains. Instead, people who lead non-software projects must understand how agile creates the flexibility to accommodate mid-project change, and then build a new system employing these principles.

In this article, we look at how to create a project environment that supports flexibility. Other articles in this series address more aspects of building a flexible project management system:

- “Agile Isn’t Just for Software” - the importance of using iteration, rather than strictly sequential processes, to maintain flexibility in a turbulent project environment
- “Enabling a Flexible Team” – the impact of getting the right people on the project team, and then giving them authority and suitable space to work in
- “Building a Flexibility Toolbox” – how project managers can flexibly plan projects and manage risks management

### Apply Flexibility Selectively

Flexibility is not a universal blessing. It is a set of tools and techniques that can be applied to projects selectively to deal with uncertainty or the anticipated changes in a certain part of the project. The reason for this is that flexibility has its price, as we will

discuss below. Consequently, development processes must be adapted to the kind, location, and timing of anticipated changes.

## Flexibility Pays Off When Change is Frequent

Many managers are anxious about flexibility because it leaves loose ends, which seem to be open invitations for budget overruns and slipping schedules. We believe that flexibility, when properly applied, actually reduces the range of likely outcomes in a project when uncertainty is involved.

Here is an example. Suppose your firm markets bicycle components and currently you are working on a new wheel hub. There are two styles of hubs for spoked wheels: the so-called “narrow flange,” where the hub’s overall diameter is about 45 mm (1.8 inches), and the “wide flange” style, which is about 75 mm (3 inches). Popular belief is that wide flanges improve torsional stiffness (beneficial) but, in fact, engineering calculations demonstrate that narrow flanges provide plenty of torsional stiffness, so the extra flange simply adds weight and manufacturing cost. After some initial discussion, the team decides to proceed on this controversial point by applying good engineering judgment and developing a narrow-flange version. This is what the project looks like at this point and this is how it is budgeted and planned:

	<b>Cost</b>	<b>Time</b>
Develop and test narrow flange	\$100,000	3 months
<b>Total</b>	<u>\$100,000</u>	<u>3 months</u>

About two months into the project, after visiting some bike distributors, marketing decides that wide-flange hubs will sell better so they redirect the project from the narrow-flange plans (which are now sunk costs) so that it now looks like this:

	<b>Cost</b>	<b>Time</b>
Develop and test narrow flange (sunk)	\$70,000	2 months
Develop and test wide flange	\$100,000	3 months
<b>Total</b>	<u>\$170,000</u>	<u>5 months</u>

Now, the project is two months late and \$70,000 over budget. However, when the team encountered this uncertainty, they could have operated more flexibly to avoid most of the project disruption.

In the planning stage, when the uncertainty about the flange arose, the team instead could have flagged it as an uncertainty and kept it open until it was resolved. In this

case, the team could have built prototypes of the two configurations, or simply bought competitive samples of them, and showed them to an assortment of customers, including the distributors. Then, when the market preference became clear, they could have proceeded with one design that would have been final. By delaying the decision on this uncertainty, the project picture now looks like this:

	<b>Cost</b>	<b>Time</b>
Prototype and exhibit both options	\$20,000	0.5 month
Develop and test the preferred one	\$100,000	3 months
<b>Total</b>	<b>\$120,000</b>	<b>3.5 months</b>

This approach costs a little more than the first one if the team happens to be lucky and pick the correct option, but is much cheaper than picking the wrong option. This approach also has the advantage of greatly reducing the \$70,000 and 2-month variance in outcomes between the first two pictures. In addition, the project would finish on budget and on schedule, because the prototyping would have been planned into it.

A relatively small upfront investment in prototyping and market research resolved an uncertainty that could have been very expensive later on. The value of this extra upfront insurance premium depends on how likely the uncertainty is. Therefore, the likelihood of uncertainty in your project should influence how and where you apply flexibility tools.

## Keep Critical Options Open

Sometimes making decisions early in a project is a good thing, because it increases the number of stable anchor points that the project team can use to make sense out of chaos. Clearly, having many loose ends leads to blown budgets and schedule slippage; however, making decisions early in a rapidly changing environment has an insidious consequence because it may unnecessarily position the project in a tight corner when things inevitably change. An important part of building and maintaining flexibility is to keep open options that might change, which tends to run counter to the way project managers think and are expected to act. Project managers are usually paid to make decisions and to prune unnecessary paths, which seems to lead to greater certainty in their projects. Fortunately, there is a middle ground, called the “last responsible moment,” which allows project managers to establish sufficient stable anchor points by making early decisions, while deferring other decisions to retain maximum flexibility.

## The Last Responsible Moment

This is a technique for identifying and keeping options open on critical decisions that might change later, such as the decision on hub flange-width, as discussed earlier. To use the last responsible moment technique, a project manager follows four steps:

1. Identify a decision that is uncertain at the moment and that might change later as new information arises
2. Determine when this decision will have to be made to avoid incurring great consequences
3. Schedule this point as the last responsible moment for this decision
4. Start collecting information to help make a better decision by the time its last responsible moment arrives

Several conditions can determine when the last responsible moment occurs, such as an important option expiring or project cost rising abruptly at a certain point if the decision is not made (see Smith below, p 155); usually, the last responsible moment is the earliest time out of all of these conditions.

The last bullet above is critical for distinguishing the last responsible moment from procrastination. Procrastination is simply being lazy about making a decision—putting it off because this is the easiest thing to do. In contrast, the last responsible moment is an active process in which you are busy collecting information so that you will be as ready as you can be when decision time arrives.

Making decisions in this way has two benefits. The first is flexibility. By definition, carrying a decision until its last responsible moment is not expensive, and it provides you with opportunities to change direction as late as possible without incurring unreasonable costs. Second, delaying a decision in this way allows you to make a better decision when the time comes, because when you make the decision, you will be working with the freshest, most complete information available for making it.

## Endpoint

Here are the essential points to remember:

- Flexibility has costs as well as benefits, so apply it only on projects—or parts of projects—where you anticipate change.
- The cost of flexibility is much lower than the cost of an 11<sup>th</sup>-hour project change.
- Actively open, maintain, and close options as you reassess your project's areas of uncertainty.
- In areas of uncertainty, make decisions at the last responsible moment.

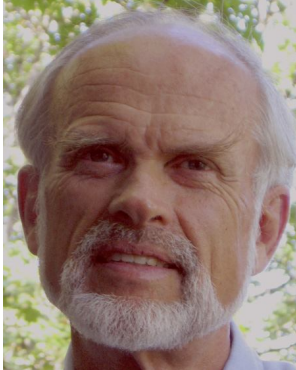
The upcoming final article in this series will address areas of project management that must be handled differently in a turbulent environment: project planning and project risk management.

## **Further Information**

Brandt, Jobst. *The Bicycle Wheel* (Third Edition). Palo Alto: Avocet. 2002. pp. 61–62.

Smith, Preston. G. (2007). *Flexible Product Development*. San Francisco: Jossey-Bass.

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