

WHY COMPANIES AREN'T JUMPING ON THE 'AGILE' BANDWAGON

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Agile product development – already proven for software products – promises competitive advantages in today’s turbulent business environment. But outside of software, companies have been slow to adopt agile ideas: They may be clinging to outdated beliefs about project planning and mid-project change.

The “*Best of Visions*” 2010 award-winning article¹ makes a strong case for the value of agile development for large, complex software projects. The need for product development agility is evident in interviews with global CEOs, one of whom stated, “You can be good at everything, but if you can’t adapt, you’re dead.”²

Although agile software practices can’t be translated verbatim into other types of product development, two schools of thought – Flexible Product Development (FPD) and Lean Product Development (LPD) – offer ways to adapt agile principles more broadly.

But outside of software, companies seem slow to heed the agile message. Katherine Radeka notes in the December 2010 issue of *Visions*³ that lack of management support is a barrier to adopting LPD, and recent interviews with NPD leaders⁴ indicate that practitioners and managers often misunderstand the cost of mid-project changes.

Altogether, it seems that traditional beliefs about project planning and the costs of mid-project changes are holding back adoption of agile practices by many companies.

CONFLICTING APPROACHES TO PLANNING

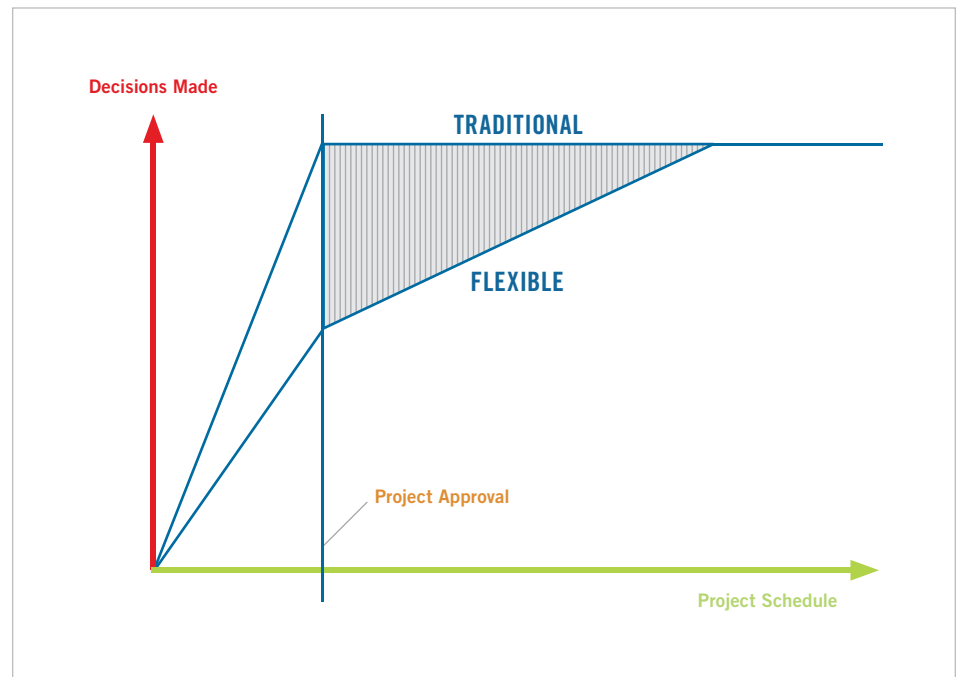
Agile development requires a new planning approach that conflicts with traditional “best practice” beliefs that are deeply ingrained in management culture and practices. Figure 1 (see page 38) illustrates how traditional processes call for making all project decisions early and freezing plans during development, while flexible planning keeps specific decisions open until later in the project. In many companies, beliefs in frozen plans are so deeply ingrained that managers and developers alike are reluctant to adopt the new approach.

Traditional planning beliefs were developed for incremental innovations in stable markets where agility was not needed. But the biggest opportunities today require rapid innovation in emerging markets. Here, frozen planning is not only ineffective – it is counter effective.

The idea behind flexible planning is that some decisions should not be made prematurely but rather later in the project when

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Figure 1: Conflicting Approaches to Planning



This diagram illustrates when planning decisions are made. With traditional planning, all decisions are to be made before project approval. With flexible planning, uncertain decisions are left open until later in the project. The shaded area indicates opportunity to learn and adapt.

better information is available. For example, customers in emerging markets are learning about their needs at the same time that suppliers are developing solutions. If developers decide prematurely about product requirements, they will probably have to deal with costly changes in the middle of their project.

AN EXAMPLE OF CHANGE

In one example from the NPD leader interviews, a wireless telecom terminal company sought to expand into an adjacent market. Developers would use their technical know-how to build mobile data collection terminals for taxicabs, and a partner would provide the base stations. It was important to keep their plans under wraps to avoid tipping off competitors.

The completed system looked good in the lab, but in field trials, the in-cab terminals experienced a high failure rate because the drivers washed their cab's interior with a pressure washer.

Although the system was ready for market launch in every other respect, designing a water-proof enclosure and necessary changes in the electronics delayed launch by four months. It also drove expenses \$100,000 over budget.

UNDERSTANDING THE COST OF CHANGE

Understanding the cost of change is important because reducing this cost is a primary driver for managing planning processes.

The NPD leader interviews uncovered an almost universal misperception equating the cost of change to the cost of departing from the plan (four months and \$100,000 in the example). But the enclosure change was necessary to make the product successful. The true cost of change was not the cost of departing from the plan – it was the investment sunk into enclosure decisions that later proved to be wrong.

Misperceptions about the cost of change distort managers' and practitioners' thinking about planning. In companies where the yardstick for project success is sticking to the original plan, mid-project changes are blamed on poor planning, but they may actually be caused by unavoidable mid-project learning. In the example, mid-project learning was unavoidable because an early exploration of the application environment might have tipped off competitors.

The cost of change is amplified by the “ripple effect,” which occurs when a change in one area of a design ripples through to other areas. In the example case, the need for a watertight enclosure rippled into a need for a new display, which in turn required new



display firmware and interface electronics. This ripple effect is even more costly when cascading changes create quality problems.

The cost of change is also amplified when other parts of the organization have sunk investment into supporting plans that change. In the example, production tooling and inventory may have been purchased for the first enclosure, which would then be scrapped when the enclosure design was changed.

FROZEN PLANS INCREASE THE COST OF CHANGE

Traditional beliefs hold that it's necessary make project decisions and freeze plans before starting development in order to avoid costly changes later, so it's counterintuitive that this actually increases the cost of mid-project changes.

When staying ahead of competitors means starting a project before requirements or innovations are completely understood, some planning decisions will be premature. Because premature decisions do not resolve uncertainties but only paper them over, the cost of change increases in three ways. First, when uncertainties are hidden, developers invest in following the design paths defined by the frozen decisions. Later, this investment must be scrapped when the decisions are revised.

Second, premature decisions prolong the shaky investments by delaying the learning that developers need to resolve uncertainties. Presuming that the original decision was correct, developers follow the plan with blinders on until the need for a change becomes undeniable. In the example, developers only questioned their enclosure decisions when field trials proved them wrong.

Finally, freezing plans based on premature decisions compounds the ripple effect. Believing plans to be frozen, developers create integrated product architectures that are tightly focused on the frozen definition and are intolerant of changes. When a change becomes necessary, ripple effects are likely to cascade far into other parts of the design.

FLEXIBLE PLANNING AND REDUCING THE COST OF CHANGE

Although FPD and LPD methods differ in details, both espouse flexible planning—where some decisions are not made at the beginning of the project but consciously delayed until better information is available. Preston G. Smith and Katherine Radeka described some agile planning methods in a recent *Visions* article.⁵

Flexible planners do not leave all decisions open, rather they identify only specific

decisions to be kept open because they have significant uncertainty and potential impact on the project. For these decisions, explicit steps are taken to reduce the cost of changes.

For each identified uncertainty, planners define tasks and responsibilities to resolve it by an appropriate time. Before that time, developers ensure that their designs are robust to any ripple effects when the decision is finalized.

In the example case, developers had incomplete knowledge about the in-cab application environment. But fully exploring this uncertainty might have alerted their competitors, so they papered over the uncertainty by freezing their plans around premature decisions.

Flexible plans would have made the enclosure uncertainty visible so that other parts of the design could be made tolerant of the ultimate enclosure choices. Then, mid-project research with customers could have informed a better decision without delaying the market launch and without alerting competitors too soon.


REMOVING THE BARRIERS

Adopting agile development processes requires changing organizational beliefs about the need for frozen plans and the cost of mid-project changes.

Build support for flexible planning with an objective assessment of the need for agile development (not all companies or all projects will benefit from it). Look for recent cases where mid-project changes were required and apply judgment as to the cause. If the change was caused by mid-project learning not possible during the planning phase, agile development practices would have reduced its cost.

Also, be sure to look for changes that were *not* made. Situations where developers stick to the plan rather than undertaking a worthwhile change often indicate that management systems overemphasize rigid planning and inflexible execution. Agile development tools can make programs more competitive and open to change in fast-moving markets.

Finally, look for evidence that agile development would provide better support for innovation. Discussions with individual innovators often uncover cases where developing an innovation was delayed or discouraged because the innovation and customer requirements were not completely understood. Agile development helps to speed these innovations to market.

With a sound assessment of the need for agile development, it will be possible to build support for new ideas about planning. 

Approaches to Agile Development

There are three main approaches to making product development more agile.

1. Agile software development⁶ has gained wide acceptance. Developers initially plan at a very high level, and detailed decisions about individual features are held open until developers start work on each feature.
2. In "Flexible Product Development,"⁷ Preston G. Smith proposes a set of tools and methods that enable learning and adapting without the usual disruption caused by mid-project changes. Design options for uncertainties are held open until a "last responsible moment" when the cost of holding the option open becomes excessive.
3. Lean Product Development,⁸ pioneered by Donald G. Reinertsen, adapts ideas from lean manufacturing, queuing theory and other sources to product development. Planning decisions are delayed if they will have more economic value when better information is available.

ENDNOTES

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