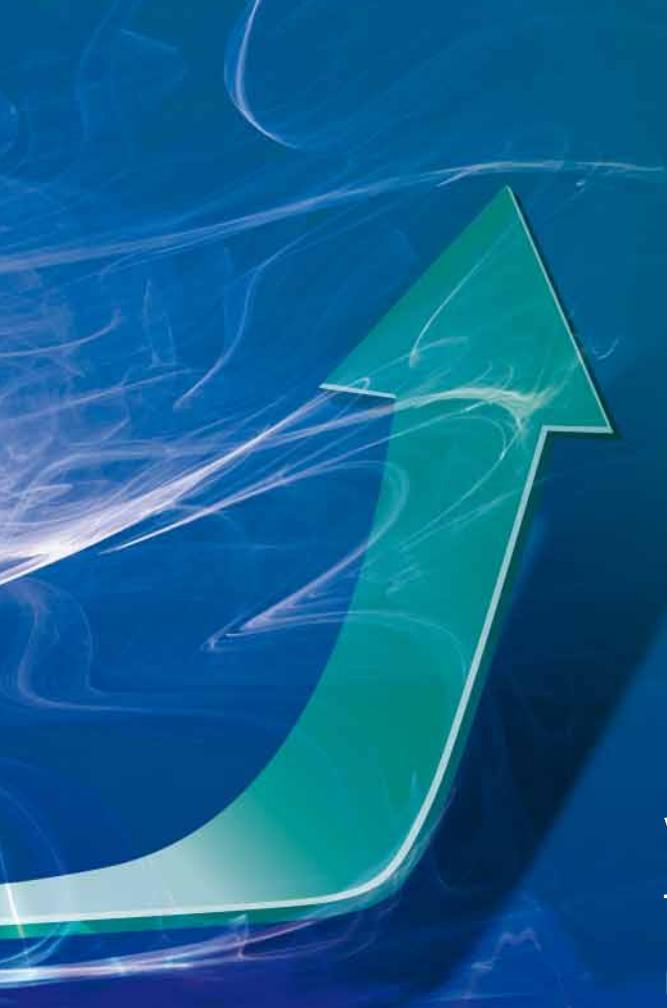


# Two Sides of Reinventing the Wheel

Wayne Turk





In project management, we've heard it before in some form or another. "Don't reinvent the wheel." "Let's not reinvent the wheel." "We're not reinventing the wheel here, are we?" It is usually spoken with a cynical, derisive, exasperated, or condescending tone.

Many times, we in DoD just recycle and repackage things, and we don't really change. In project management, there's the problem of whether or not to reinvent the wheel. Is it worthwhile to start over and make big changes, or is it better to reuse part or all of what works and move on from there?

Most people involved with project management don't want to reinvent the wheel because the wheel works well enough; and it would waste precious time, dollars, and effort doing the reinvention. On the other hand, some say we do need to reinvent the wheel, at least occasionally. If we didn't, we would still be using wooden rollers. Some kinds of wheels have to be reinvented many times before you get them right. Reinvention can be innovative and involve major breakthroughs, or it can be as simple as providing an improvement.

Who is right? Well both, of course. There are specific times and situations in which one perspective or the other can apply. The details of when and why will be provided later in the article. First, I want to start with some definitions so that we are all speaking the same language.

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## The wheel isn't perfect. What product, process, application, or tool is perfect?

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### Some Definitions

My paper dictionary is not up to date on clichés and jargon, so I had to go online to find current definitions. The following are a couple of definitions of “reinventing the wheel.” They are similar in meaning, but each has some little differences.

Wikipedia states, “Reinventing the wheel is a phrase that means a generally accepted technique or solution is ignored in favor of a locally invented solution. To ‘reinvent the wheel’ is to duplicate a basic method that has long since been accepted and even taken for granted.” Wikipedia does go on to say that the phrase is occasionally used by a person to explain what they did. In that case, it is said like, “I didn’t just reinvent the wheel.”

The Online Dictionary defines it as “to do something again, from the beginning, especially in a needless or inefficient effort; to recast something familiar or old into a different form.”

Finally, die.com explains it as “to design or implement a tool equivalent to an existing one or part of one, with the implication that doing so is silly or a waste of time.”

As you can see, even the definitions are somewhat derivative in tone. There are some other common phrases that are related or associated, which should sound familiar to many readers. I have added my own brief definition to each of them.

- “Not built here” or “not invented here”—The organization or company, for the most part, doesn’t want to use or accept things (tools, concepts, products, code, processes, etc.) not created in-house.
- “If it ain’t broke, don’t fix it”—If it works, why are we looking at changing it? An extremely common phrase that sounds good but isn’t always right.
- “Design in a vacuum”—Starting from scratch on each project or application. Frequently used in software development.
- “Leveraging on previously developed work”—Reusing work, architecture, designs, code, processes, documents, etc., to save time, effort and money. One of my favorites because it can really help save resources.

### The Cons of Reinventing the Wheel

The biggest and most compelling argument in favor of not reinventing the wheel is that it saves time, money, and effort. It is hard to argue against that in today’s economy. We can’t afford to waste anything. Someone else has already expended the resources to develop, test, and implement something, so why not take advantage of the work and the associated savings? Are the improvements, if any, worth it? Can the project team do a better job? How much would it cost, and how much time would it take? Usually the answer boils down to “we can’t afford to do it.”

In the government, and especially in DoD, we have to worry about interoperability. With the Services’ diverse missions and equipment, interoperability is a must. Reinventing the wheel with new equipment, new programming codes, etc., can throw a monkey wrench into the works, making interoperability a problem. Backfilling or making changes to products already in use to maintain or create interoperability can be extremely expensive and time-consuming.

When reinventing something, you also have to consider how to maintain the product. Say that while maintaining a program, you generate new programming codes. That puts the product in a proprietary situation. What if you’re no longer around to fix it when something goes wrong? If someone else has to fix it or change it, he or she has to comb through thousands or even millions of lines of code to figure out what you did and why. Again, that starts becoming very time-consuming and expensive.

There’s also the argument that some tasks are very tricky and hard to do right. To use programming as an example again: If the programmer’s skills aren’t up to the challenge, there is not much choice but to use someone else’s already-working code. If there is even the slightest doubt as to whether the programmer can do a task, or if someone wonders if the programmer is going to have any problems, then the answer is to reuse the code that has been tested and time-proven. That is why architecture, design, module, and code reuse is not only acceptable but is recommended or even required in some cases.

As you can see, the arguments for not reinventing the wheel are strong. So, those of us working for or supporting government and DoD in particular should never do it, right? Well, no; there are arguments on the other side, too.

### The Pros of Reinventing the Wheel

Let’s start with probably the best argument: The wheel isn’t perfect. What product, process, application, or tool is perfect? I can’t think of many, if any.

As an aside, Fran Briggs, an author and motivational speaker, once asked a group of elementary school kids why someone should reinvent the wheel (see <[www.franbriggs.com/wheel.html](http://www.franbriggs.com/wheel.html)> for the full article). Her aim was to chal-

lenge their beliefs and encourage them to think. Here are a few of the thought-provoking reasons as to why they would reinvent the wheels (on their bicycles):

- They only come in one color.
- They don't bounce.
- You can't see inside.
- They need some style.
- They're not made of steel.
- Too many flat tires.
- They're boring.
- They slow down when on grass.
- They don't glow in the dark.

Now, think about any software application that you use. Is it perfect? Does it do everything it should? Is it easy to use? Is it efficient? Does it cost too much? Does it crash or break down? The questions could go on and on. And very few of the answers are "yes" (or "no" if no is the right answer). The same goes for any other product. Even when it is a good one, there is always room for improvement.

There are other arguments for reinvention. One is that you (or your organization or company) might stumble onto something that is really innovative and maybe even profitable. It could happen, especially if the design was made without looking at what else had been already created or tried. In the case of new ideas, just because it hasn't been done before doesn't mean it can't be. Even if it has been done, it doesn't mean it can't be done cheaper, more efficiently, more elegantly, more effectively, or have better uses. Why shouldn't companies and individuals make a buck if they can?

Another very good argument in favor of reinventing the wheel is that individuals, companies, and agencies can learn from reinventing. That is one of the most common, and probably correct, arguments in favor of reinvention, especially in programming. People learn by doing, and they learn from their mistakes. Yes, they can learn theory from a book, but until that theory is put into action, that is all it is—theory.

Now we are getting into the weaker arguments in favor of reinvention. People reinvent because it's much more fun reinventing the wheel than using someone else's wheel. Or, you can reinvent the wheel because you've got nothing else to do, and you want to be busy when your boss walks by. Granted, these are not serious arguments; however, if the resources are available, and if you are not constrained by time or money, then go for it! You just may come up with something altogether new while you're doing it.

### When Should We Reinvent the Wheel?

When should the wheel be reinvented? That is really a tough question. The following are some examples of times when it might be the right move:

- When something obviously needs improvement. Maybe it was great at one time, but it doesn't currently meet

the need or help accomplish the mission in the most efficient and effective manner.

- When someone has an idea that might improve it (whatever "it" is), even if it is working. If the improvement helps make it better, cheaper, easier to use or maintain, or improves the efficiency, why not use the idea?
- When someone has a new and innovative idea. If the idea will lead to a better product or process of some kind that is needed or useful, reinvention may be worthwhile.
- When the dollar and time constraints aren't there. This doesn't happen often, but it is in the realm of possibility.
- When a company can't reuse something that already works because it is patented or copyrighted by another company, and the licensing would be too expensive or the other company won't allow its use.
- When someone needs the experience. As was said earlier, people learn from doing. We have to get people who are new to a field or new to an office some experience so that they can progress and become a more valuable asset.
- When someone is willing to do it on his or her own time. Who knows? It may produce a winner.
- When it is research and development. Research and development isn't always about brand new products. Sometimes it is reinvention for improvement or to meet a new need.

### Making the Decision

In the past, I carried out a number of business process re-engineering projects. When we examined processes and considered changes, we always asked two questions: "Why" and "why not?" Why were the organizations doing something a specific way? Why not change? Sometimes there were good reasons not to change. Other times there weren't. Most of the time, nobody had considered the questions. Considering the whys and why-nots should be part of any process when reinventing the wheel is an option.

Not reinventing the wheel can save time and money—there is no arguing that. However, it can also restrict efficiency, improvement, or innovation. Sometimes the scales tilt one way or the other. Too often, they tilt because people don't think the issue all of the way through. People don't weigh the pros and cons of each side. They jump to a conclusion.

So are you going to reinvent the wheel on your project? That is up to you. It might or might not be the right answer, but don't automatically dismiss reinventing right away. Think it over, weigh the costs and benefits, and decide what is the best solution—and don't let preconceived notions of reinventing the wheel influence your decision.

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