Managing
System
Development

Practical ideas for improving productivity and quality

The Next Silver Bullet*

by Joseph R. Schofield, Jr.

A 32-bit yawn of apathy for the three to five percent gains realized with each seized opportunity; Technology hopping is restraining us from achieving the very gains we hoped for

The release of each new software technology carries with it promises for increasingly higher levels of productivity. In just the past few decades, "silver bullet" solutions have come in the flavors of fourth generation languages, artificial intelligence, computer-aided software engineering, rapid application development, prototyping, and let's not forget today's current contributions to chaos: client/server, object-oriented programming, and the distributed computing environment (DCE).

Contrary to popular myth, each of these technologies has not brought the leap in productivity so sought by its subscribers. Instead, productivity researchers indicate little more than a 32-bit yawn of apathy for the three to five percent gains realized with each seized "opportunity."

Is it possible, even likely, that technology hopping is restraining us from achieving the very gains we hoped to achieve? The following postulated archetype may lead to such a conclusion; but, in addition, offers potentially powerful insights regarding the nature of software development and the search for the next silver bullet.

Ever since Frederick Brooks popularized the notion of the "silver bullet," technologists have been trying to prove him wrong—without much success! Understanding what happens when a new technology is introduced is essential to comprehending why.

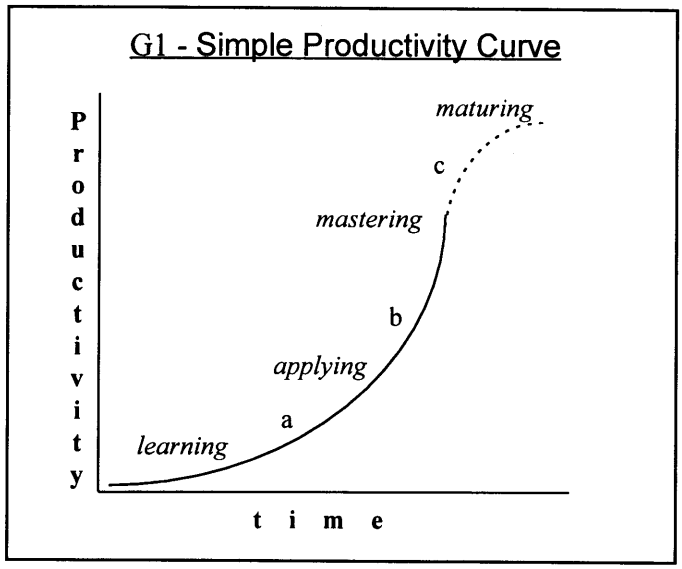
In the "womb" stage, the technology receives all the due pre-arrival hype. Interest and curiosity are high. Upon arrival, those who apply the technology quickly discover its weaknesses, and, more slowly, its power.

We identify this period of understanding as the "learning curve." Productivity is not soaring during this introductory stage. Life cycle-based productivity can be represented in Graph 1 on page 2.

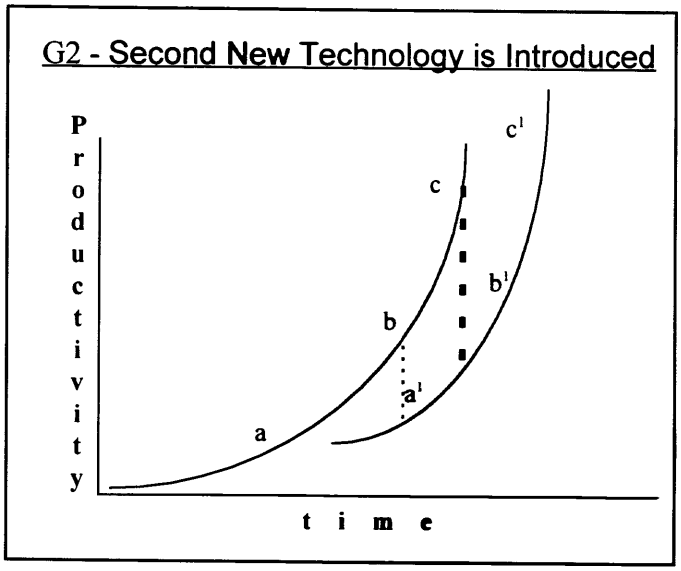
The first graph has a productivity and time axis. In addition, it has three data points; each is significant in constructing and understanding the archetype. A four-phase technology life cycle parallels the discussion of these data points. The four phases are identified as learning, application, mastery, and maturing.

Data point "a" represents the point on the curve where "learning" shifts to "applying." As such, productivity begins to rise rapidly.

Data point "b" represents a point along



Graph 1.



Graph 2.

the curve where the new technology is being applied, restoring productivity to a level prior to the introduction of the new technology.

This second data point, like the other two, is not fixed; that is, it may move along the curve depending upon other factors in the environment. Some groups may report that point "b" actually occurs when technology is introduced. These groups would serve as interesting case studies, and it is likely that several nontechnical productivity constraints exist in their former environments.

Between data points "b" and "c" the technology becomes mastered, meaning that it is repeatable and predictable. Beyond data point "c" the technology becomes mature. While it may still be used with a high degree of productivity, its well-entrenched proponents may also begin to restrain movement toward newer technologies and higher productivity curves.

The "in-flight magazine syndrome" describes this talent for prognosticating that which ain't yet but that someday will be

While it appears that achieving mastery with a technology is the precedent to sustained high levels of productivity by exploiting and leveraging a technology, the unexpected (or is it the expected?) occurs. It's at this very point of breakthrough when someone else in the corporate food chain discovers the "next silver bullet." While it is ill timed, ill fated, and unfortunate, it is nonetheless reality.

The "in-flight magazine syndrome" has been used to describe this unusual talent for prognosticating that which ain't yet but that someday will be. Most of us are all too familiar with this syndrome. We have seen it in action many times, but were unaware of its cause or its name.

Its manifestations may be vocalized as, "This is where the industry is headed," or, "Everybody's doing this—why aren't we?" or, "The competition is getting a leg up on us in this area and we cannot afford to be left behind." One advantage of being a visionary is that you do not need any facts to support your claims; besides, the technology is so new that the rigorous data isn't there yet.

Adding a second curve to represent a second technology to the earlier graph can help explain these events. The *maturing* stage is eliminated from this and subsequent graphs to simplify the model.

The second curve should be familiar in two respects. First, it has the same three data points as Graph 1; designated as a1, b1, and c1. Second, the curve has a similar slope to the first.

But the curve is also noticeably different from the first. It begins higher along the productivity axis, implying that its mere adoption improves productivity. This phenomenon could be attributed to the Hawthorne effect and the anticipation that accompanies the introduction of a technology.

Another difference is that the second curve extends beyond the first on the productivity scale, implying a higher productivity boundary (even prior to maturing). As part of the "in-flight magazine syndrome," the extended curve is consistent with early technology hype and promotions of prolific productivity.

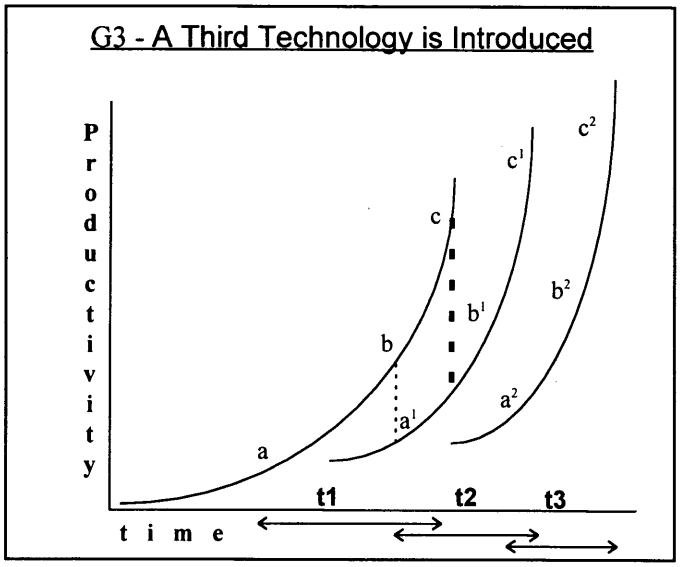
The dashed lines, however, begin to explain the importance of this archetype. The leftmost dashed line between data point "b" and a1 depicts the reduction in productivity, as an organization migrates from an "applied" technology to the "learning" stage of a more advanced technology.

The phrase "one step forward, two steps back" is demonstrated here. The thicker rightmost dashed line indicates the difference between the earlier technology in the "mastering" stage, and the later technology, now in the early part of the "applying" stage.

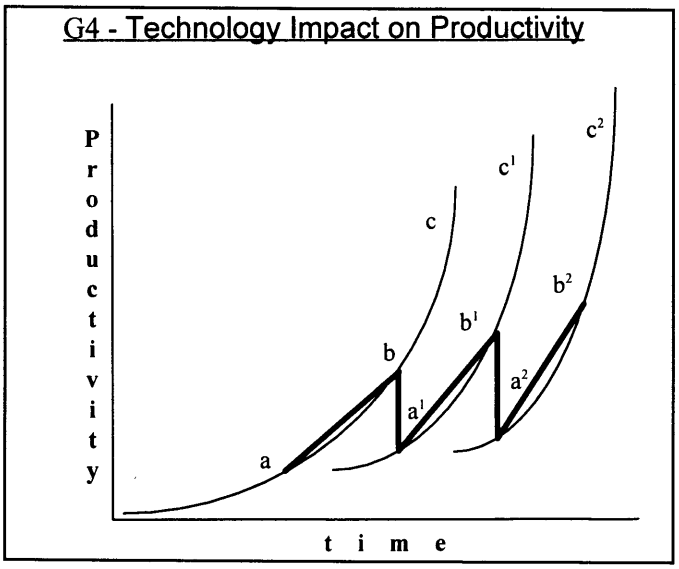
The difference in both dashed lines also indicates why software teams under pressure to produce are frustrated by emerging technologies that seem to surface about the time they get what they might describe as a "handle on" or "arms around" the last silver bullet. This frustration is then exacerbated by being sometimes encouraged (but feeling coerced) in the direction of the next silver bullet.

The third graph adds a final technology curve. Again, patterns similar to those identified with the introduction of the second curve exist. The potential ceiling for productivity is raised, and a return to productivity is accelerated.

Elapsed time lines are added along the horizontal axis to illustrate the shrinking window of time for introducing subsequent technologies. An observation is that the time is reduced between the "learning" and the "mature" phases for each successive curve. This reduction confirms the stated desire of



Graph 3.



Graph 4.

many organizations today to "do more with less faster."

With the fourth and final graph the timelines and dashed lines have been removed. Instead, an approximation of the movement of productivity is revealed. The movement in productivity is not what is desired.

Strategic importance of new technologies dwindles as the pace of release is quickened

A preferable impact on productivity would show a greater productivity increase over time. In order to achieve such an increase, more time is needed as the technology is mastered and matures.

In essence, the space along each of the technology curves above the productivity "zigzag" represents foregone leverage. Staying with either of the first two technologies in the short term would provide dramatic increases in productivity. Examples of this are organizations that are two curves "behind" in technology, yet are able to provide all the information support to sustain profitability in their companies.

"In the short term" is the operative phrase because in the "long term" any of these technologies will reach its maximum productivity effectiveness; the earlier the curve, the sooner the productivity "dead end." At some point, old technology must be abandoned as it becomes a nonsupported product and even a morale threat to the internal technologists.

Connecting the apexes along the productivity "line" offers an average productivity growth slope. By avoiding leaps to each new technology, the potential to reap productivity gains during the mastery and maturing phases far exceeds slight increases in regression during the learning stage. In other words, finding someone to time the movement to new technologies is worth a significant productivity gain—one that may be hard to find while evolving through technology releases.

Technology alone is not determinative in the successful deployment of information systems. Another consideration is the desirability of the workplace; opportunities to work with the latest and greatest "bleeding edge" technologies.

As technologies unfold, these desires may be so great as to outweigh a perceived risk-adverse "wait and see" approach; however, the same position may also be described as an attempt to further leverage existing capabilities. "Trace elements" of this same desire can be found at all levels in the organization. The "in-flight magazine syndrome" just happens to portray it as its higher levels.

The strategic importance of employing new technologies for competitive advantage seems to dwindle as the pace of the release of technologies is quickened. Another approach is to "phase in" technologies such that many are employed at any point in time; some on their way in, some being "leveraged," and others on their way to retirement. Training and support costs tend to rise in these situations.

From a business perspective, we probably have several working technologies that could be leveraged well into the future. We could perhaps even skip a technology wave or two and still outperform those organizations that unwillingly and unknowingly "beta test" technologies. The bottom line in information technology has never been who has the most, or the latest, or the greatest; but rather, as elsewhere, who does most with what they have.

One other observation is offered. High-tech corporations often showcase their products and technologies to increase their marketing stature and credibility. When considering which technologies to apply and master, it may not be important in your environment to explore the "bleeding edge." Instead, high quality and reliability may be all the excitement your customer desires.

In summary, this brief look at technology curves is intended to provide some useful insights into gradual increases in software productivity—when far steeper increases are often sought. The archetype accounts for shrinking time frames, apparent decreases in productivity, "creeping" productivity, and the motivational appeal fostered by the "in-flight magazine syndrome." If you feel like I do, you now need to decide with all this equipping information whether this archetype belongs in a two- or three-tier client/server architecture, and then whether to wait for "mature" workflow products before passing it on to the boss!

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