ONE BANANA, TWO BANANAS…

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By
Dr. Hwa A. Lim, Ph.D., MBA, Silicon Valley, California, USA

Globalization, as defined by rich people like us, is a very nice thing... you are talking about the Internet, you are talking about cell phones, [and] you are talking about computers. This doesn't affect two-thirds of the people of the world.
- Former U.S. president Jimmy Carter.

Nature has a beautiful way to illustrate the growth process. Take the bamboo tree, for instance. The seed/shoot is planted, watered, and fertilized. For the first four years, there is no visible growth. However, during the fifth year, the bamboo grows ninety feet in six weeks. Now did the tree take five years to begin growing? Not at all. Although growth was not visible, the root system experiences tremendous development during the first four years, thereby making it possible for the bamboo to stand sturdy and secure.

This takes us naturally into technology development and growth.

Technology and Economics

Technology in itself is neutral; but technology and economics are a potent blend. We can use them to enrich our lives or let them lose all meaning. What we cannot do is to pretend that nothing has changed and live in the garden of remembrance as if time had stood still.

At the end of the 20th century, six new technologies—microelectronics, computers, telecommunications, new man-made materials, robotics and biotechnology—were interacting to create a new and very different economic world. The old foundations of success are gone. For all of human history, the sources of success have been the control of natural resources—land, gold, and oil. Now added to those is information and knowledge.

Information technology links the processing power of the computer with electromagnetic waves, the satellites, and the fiber optics of telecommunications. It is a technology that has been leaping rather than creeping into the future. It has been said that if the automobile industry had developed as rapidly as the processing

power of the computer, we would now be able to purchase a 400 mile-per-gallon Rolls Royce for a mere £1.

Modern information technology is so ubiquitous that we take it for granted. But early information technology was very crude, slow, clumsy, and could be very risky. In the mid 1970s, industry analysts predicted that the personal computer would soon lead to paperless offices and robotic workplaces. Billions of dollars were invested in making those visions come true, and billions were "wasted." Managers need decades to learn how to best use computer technology and reorganize workplaces for efficient production.

The estimated $2 trillion invested in computer and communications technology since 1973 eventually started to produce faster economic growth and more rapidly rising living standards about a quarter of a century later. During that period, businesses and workers have stumbled as they tried to use successive generations of computers to improve efficiency; now, they are mastering the new-networked computers and unleash a surge in productivity.[1]

Where Is The Beef?

Productivity experts find it easier to exonerate suspects than to convict them for causing the slowdown. At first, economists blamed the oil shock of the 70s; but oil prices came down, and productivity failed to rebound. Next they blamed the torrid inflation of the 1970s and early 1980s; but productivity did not turn up even after inflation was licked in the 1980s. By the turn of the century, then they accused the flood of inexperienced workers—the booboo [Silicon Valley slang. A booboo is someone just out of college, especially an engineer, placing too much reckless artistic flair or academic emphasis in commercial development. This usually shows the individual is a business novice]—both baby boomers and women returning to the workforce; but the youngest baby boomers were then past 37 years old, and most women in the workforce had been working for a while and had been a significant contributor to the economy. Yet productivity still lagged. Then some economists turned back to the time-worn complaint about the fading work ethic; but that was not any more compelling then than it was in the past.

In fact, manufacturing productivity recovered from the slump of the late 1970s and early 1980s in part because factories know how to unleash the power of computers. Manufacturing statistics are straightforward to gauge—for example, the number of tires produced during an hour of work. But because it is harder to estimate gains in the service sector, the government normally undercounts them. Is a doctor more productive if he sees more patients in an hour, or if he sees fewer patients but cure more of them? Is a law firm more productive if it revises a legal brief eight times in the same time that it used to take to revise the document once?[2,3]

The effect of all the early hype was twofold: People believe that computers were some kind of pass to the future, and when computers did not deliver much, they blamed themselves, not the machines.

Nevertheless, the chasm in the last twenty-five years of the 20th century between the technological advances of the computer era and the broad productivity disappointments is not simply a reflection of poor measurement. Even if the measurements were perfect, the mystery would remain. Why has not the computer revolution done more to raise the living standards during those twenty-five years? In good measure, it is because computer systems were so complex, and computer and software designers were so out of touch with computer users, until recently.

Here Comes the Banana

Computers drive people crazy, even smart people. They can be hard to use and they are poorly designed and there are too many BDUs [Silicon Valley slang. BDU stands for brain dead user, and therefore a BDU is a user who does not follow any documentation or manual at all and is calling technical support all the time].

Computer industry doyens love to think of themselves as the sprinters of the economy, bursting past the laggards on their way to prosperity and productivity. In reality, the computer-driven economy moves more like a foxtrot dance—two steps forward and one step sideways. For example, icons, the tiny screen sketches that substitute for typed commands. When Apple computer pioneered the icon, they freed the users from memorizing opaque commands. But now computers are so chockablock with icons that it is impossible to remember what they all mean. Rather than boost efficiency, they stymie it.

The frustration period of education is now near completion. Companies are learning how to use the technology not simply to automate old way of doing business, but to find new ways that make their workers more productive. Figuring how to use computers more wisely will help boost productivity and living standard, but that is not the only reason to be optimistic. Figuring how to use—informate, rather—people will contribute as well. Here we differentiate between automating and informating: automating tends to concentrate on the smart machine and to cut out or reduce people; informating uses smart machines in interaction with smart people. In the short-term automating pays off, but informating wins in the long-run because the organization's thinking and intellectual capacity increases with time.[4]

Beneath all the management fads and buzzwords—and buzzword specialists [Silicon Valley slang. A buzzword specialist is someone who knows and can impress management and customers with an outstanding knowledge of industry buzzwords, but who has no real working knowledge of the technology]—that are so easy to ridicule, successful businesses and workers are changing the organization of workplace, and improving efficiency in the process.

Many times, the solutions are achingly obvious—software designers should talk to end-users before they design new programs.

Programming attracts twice the proportion of introverts and three times the number of intuitive thinkers as is in the general public. They rely on their own thoughts and imaginations to solve problems—an admirable quality, but a potentially disastrous one in designing useful products.[5]

This can create a many-banana problem. A banana problem refers to something or a situation in which it is not expected to require a lot of effort for the less technically knowledgeable types to grasp. The problem at hand is so simple that even a big dumb gorilla can handle. In Silicon Valley, a problem is rated by the number of bananas. Thus a one-banana problem is very easy to solve. A two-banana problem is a little harder than a one-banana problem, but is typically still simple. A three-banana problem is harder and so forth…

Some software managers reinforce keep-your-distance attitude. No testing on anyone who might actually use the software later for it may delay the project. We thus see a lot of borgware [Silicon Valley slang. A borgware is a piece of software that when installed, requires the use of other products by the same company. Microsoft is known to produce such software].

So long as software is complicated, those who write and oversee it can command higher salaries. So they purposefully make the software difficult or incomprehensible. We thus see a lot of bit-busting [Silicon Valley slang. To bit-bust is to write very low level, machine-specific software. Most often in assembly language] on the part of the developers, and many bloatware [Silicon Valley slang. A bloatware can be 1) a software package that has excessive features that a minority of users access, usually happens on the third major release of the package, 2) a software package that comes with demos of other software packages making the installation process longer] in computer software packages.

It is not only the programmers' fault. Sometimes companies have outlandish expectations. Manufacturers in developed countries thought they could computerize and automate their way out of trouble in the 1970s and 1980s when they were being battered by competition from overseas. But this is only minor part of the equation in globalization, which eventually leads to a lot of outsourcing.

Today, much of the simplifying technology comes from those working with the physically challenged and from the military, where the machinery must be designed so that it can be used by ordinary young people. Text scanners, for instance, were created so that books can be entered into computer databanks and read to the blind and those with sight impairment; voice recognition technology was designed, in part, as a way for those without the use of their hands or eyes to run computers by eliminating the keyboard. Army tanks designers have been pioneering ways to simplify software so that high school graduates can operate increasingly sophisticated computer-controlled devices. Civilian computer designers, at least successful ones, now think and work the same way.

What Has Bamboo Got To Do With It?

A bamboo tree spends the first four years to develop its root system, with no visible growth. However, during the fifth year, the bamboo grows ninety feet in six weeks.

Information technology went through root development stage for a quarter of a century. It is now paying off big time. Now we can only watch with amazement when a three-year-old child sits in front of a computer multitasking, performing instant messaging, blogging, flashing website concurrently while sipping energy drinks…; the older generation is content with being able to use the computer as an expensive typewriter, while chewing on a banana maybe.

Now the next challenge—the interface of natural resources and technology—has begun. Alternative and renewable resources are now developing their bamboo root systems. Many scientists say the only real long-term prospect for significantly substituting for fossil fuels is a breakthrough in harvesting solar power. This has been understood since the days of Thomas Edison. In a conversation with Henry Ford and the tire tycoon Harvey Firestone in 1931, shortly before Edison died, he said: "I'd put my money on the sun and solar energy. What a source of power! I hope we don't have to wait until oil and coal run out before we tackle that."

Had biotechnology been around then, Edison would have added biofuels to his list.

In the Internet boom, the mantra was to change the world and get rich quick. This time, given the size and scope of the energy market, the idea is to change the world and get even richer—but somewhat more slowly. Alternative and renewable resources are now developing their root systems. When the time comes, the energy resources bamboo trees will suddenly grow ninety feet, and taller than the Internet bamboo trees.

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About the Author

Hal in his office in Kuala Lumpur.

Dr. Hwa A. Lim obtained his Ph.D. (science), M.A. (science), and MBA (strategy and business laws) from United States, his B.Sc. (Hons.), ARCS from Imperial College of Science, Technology & Medicine, London. He is also known as "The Father of Bioinformatics." Most of his early work on bioinformatics was performed at a U.S. Department of Energy (DoE) supported supercomputer institute, where he was program director, and tenured state-line faculty. Hal has served as a bioinformatics expert for the United Nations, a review panelist for U.S. National Cancer Institute, and as an expert consultant for McKinsey, Prudential, VAXA, Eli Lilly and Company, Monsanto and Company, Dupont CR&D, and Robertson Stephens.

His career started with a short stint at the Strong Memorial Hospital, New York, and later computational work using computers at the John von Newmann Center at Princeton University. In 1995, he advanced his career to California after having been at Florida State University for eight years. In May, 1996, he was on the BioMass Panel organized by the American Association Advancement of Science (AAAS) at Stanford University.

Hal has published over 100 scientific papers in peer-reviewed journals, and has written/edited more than fifteen books on diverse topics in English. Currently, he is affiliated with the academic and private sectors. Hal resides in Silicon Valley, California, USA, and may be reached at hal_lim@yahoo.com; hal@dtrends.com.