

## Innovation Sails Free

The open-source idea is moving beyond guerrilla software

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Oct. 18 issue - Extreme windsurfers in Hawaii might not seem to have much in common with the community of geeks who tinker with Linux software as part of the open-source movement. But in the late 1970s pioneers of the sport freely swapped ideas on how to redesign their equipment right on the beach, and sporting-goods makers were quick to pick up on innovations like foot straps for leaping giant waves without falling off. Indeed, the basic idea of open-source design has been practiced for centuries—for example, by farmers who have crossbred crops, says Eric von Hippel, MIT's head of innovation and entrepreneurship. In the 19th century, once the patent for the steam engine expired, other inventors quickly made, and shared, long-awaited improvements.

The radical success of Linux is making such freely revealed innovation (the term "open source" really applies only to software) a hot idea again. After decades in which patents closed off the innovation process, open source has caught the attention of businesses because "it so violated accepted wisdom and [has] so clearly worked," says Yochai Benkler, a Yale scholar writing a book on the economics of peer production. Giants like IBM and HP, and newcomers like Red Hat, have made lots of money on Linux-based services and equipment, and open source is now seen as a viable business model. Benkler believes the concept will even guide the information economy away from a lingering industrial mind-set, based on returns from high capital investments protected by patents, to one where firms can make money by selling the tools for a shared production system (IBM servers running Linux, for example).

Freely shared innovation is already seeping into pharmaceuticals, a field where most profits are gained from expensive patented drugs. The BioBricks project at MIT, for example, is trying to establish standardized tools and processes for basic DNA work. This is largely done by computer, so researchers from all over can contribute chunks of the work. It also makes sense in areas where patents are not useful, or where expensive lab tests aren't necessary, such as finding new uses for existing drugs. Von Hippel is studying all the FDA applications made since 1998 for these so-called off-label uses of patented drugs to see whether, as he suspects, they come mostly from independent researchers rather than the big drugmakers that hold the original patents.

An open system also makes sense when the payback is too small to entice Big Pharma, as in the case of tropical diseases like malaria. The solution doesn't have to be charity. University of California, Berkeley, law professor Stephen Maurer has coauthored a proposal called the Tropical Disease Initiative, which would need some kind of government or charity backing to get started, and is negotiating funding at the moment. It would give scientists a chance to work on finding drugs to help fight the likes of malaria, dengue fever or river blindness. Because discoveries would not be patented, the development contracts could be awarded to the lowest bidder. Manufacturing prices could be kept down, too, because generic-drug makers could compete as soon as the drug was ready for production.

The main point of open innovation is to unlock creativity from as many sources as possible. The contentious field of plant genetics, which pits activists opposed to genetically modified food against scientists who argue that it is the only way to fight world hunger, offers a clear example of how that can work. The basic tools for manipulating plant genes are protected by a thicket of patents largely controlled by multinationals, which means that farmers in developing countries don't have access to the techniques they need to create robust crops that suit their soil. The BIOS Initiative, recently launched by Cambia, an Australian nonprofit, aims to make publicly available an alternative technology to the patented method of inserting a gene into a plant. (People are free to patent any resulting discoveries.) A Web site called BioForge.net, modeled after SourceForge.net in software, will be a clearinghouse for open biology projects. BIOS director Richard Jefferson says the aim is not teach people to fish, but to "figure out what is preventing people from inventing their own better way to fish." One early aim is to help farmers find a way to breed their own maize, so they don't need to buy expensive hybrid seeds each year. It's not yet clear just how far this kind of research can be democratized. But in many areas, the open option is quickly becoming a serious one.

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