

4 strange places to find open source

<http://www.itworld.com/software/221653/4-strange-places-find-open-source>

November 07, 2011, 8:00 AM

By Carla Schroder, ITworld

Open source is about more than code: it's about unlocking all possibilities. Here are four unusual projects made possible by open source.

Prosthetics

Years ago I hung out with a friend who had a prosthetic hand. It was a stiff plastic hand, like a store mannequin hand, that could open and close in a simple grip. It didn't have much functionality, but it had a bit of fun factor -- my friend liked to remove it to scratch his back. In public, of course, with a freaked-out audience. Americans seem to have a hard time looking at these sorts of things.

[\[8 strange places to find USB ports \]](#)



A prosthetic eye is nice to view, but it

cannot see.

Source: Wikimedia Commons

Prosthetics have advanced since those days, especially in cost. It's amazing how labeling an item as medical equipment makes it cost 10 to 100 times more, even ordinary parts like nuts, bolts, batteries, and power supplies. A prosthetic limb starts at five figures, and in these here kindly times good luck getting insurance to pay, because it's become a one-way flow -- we're supposed to pay our premiums without desiring to collect any benefits.

And so, once again, open source has made it possible for one person to step up and try to change an unsatisfactory state of affairs, and that person is Jon Kuniholm. Mr. Kuniholm is a war veteran who lost part of his right arm in Iraq. He was given an assortment of prosthetic arms to use, from an old-fashioned hook to a shiny new myoelectric arm. None of them were completely satisfactory. The fancy myoelectric arm was fragile and heavy, and had to be protected from moisture and dirt. The most popular upper-body prosthesis is the oldest, the body-powered hook. This is fastened to your torso with a harness that transfers movements, such as a shrug, to control the elbow, hook, or hand. Hook-type prostheses have been around for decades, and are rugged and relatively inexpensive, which is not to say they're cheap, just less costly than newer technologies.

Mr. Kuniholm is a biomedical engineer, and after leaving the Marines he returned to his job at [Tackle Design, Inc.](#), an industrial design and research company. He and his co-workers took the arms apart and studied them, and looked for ways to improve them. Then they founded [The Open Prosthetics Project](#) (OPP). The Open Prosthetics Project focuses on helping people with missing limbs. (If you have an interest in bringing open source to ears and eyes, the field is wide open.) OPP collects information and data, does design research, and freely shares plans, specifications, and information.

Building a good prosthetic foot or leg is moderately difficult. Building a hand that works anything like a human hand is incredibly difficult. But remember playing with Legos as a little kid? Legos are not just kid toys -- they are also [articulated hand prototypes](#). (It looks like a Terminator hand.) Motors and batteries keep getting smaller and better, so someday this will be a reality.

You can learn more about Mr. Kuniholm in this [interview and book excerpt](#) on National Public Radio.

Affordable, practical small-scale manufacturing

Way back in the last millennium, in the 1970s, there was a brief "back to the land" movement. Idealistic city folk threw off their corporate shackles, bought land, and had this idea they could be self-sufficient. Of course there is a whole lot more to living off the land than bib overalls and good intentions. It's a lot of work, requires a lot of tools and machines, and a lot of skills and knowledge. Practical manual skills are in short supply in these modern times and tools are expensive, so the learning curve, costs, and hard physical labor defeated a lot of wannabe hardy pioneers. The concept was sound: to take control of the production of life's essentials such as food, energy, and shelter, to live more harmoniously and leave a less-destructive footprint on the planet, to live in a healthier way, and to control technology for the benefit of the people using it. It all sounds good, but making it work was the beastly part.

Fast-forward to now, and open source and the Internet have changed everything. [Marcin Jakubowski](#) is a physicist who tried farming, and quickly learned that he had no practical skills or knowledge. So he began his education anew, and came up with the concept of affordable, practical small-scale manufacturing to build and maintain a small, sustainable civilization with modern comforts. He figured that it would take a set of 50 different industrial machines to do this, and this is the [Global Village Construction Set](#) (GVCS).

The GVCS includes a tractor and implements, brick press, sawmill, well-drilling rig, induction furnace for melting scrap metals, 3D scanner, 3D printer, welder, solar concentrator, and a CNC circuit mill for printing circuit boards. The idea isn't to scrape out a marginal existence, but to build high-quality essential tools for a fraction of the cost of their commercial cousins, use them to help build a good life, and possibly some income-producing surplus.



Make your own awesome multi-purpose tractor. Yes, you can.
Source: OSE

The stakes are considerably higher for people in poor countries. GVCS offers the potential to put the means of essential production directly into the hands of the people who need it.

The specifications for the GVCS machines are the opposite of mass-produced commercial technology: low-cost, user-serviceable, high performance, durable (no planned obsolescence), and open source. The open source aspect covers designs, instructions, schematics, budgets-- everything anyone needs to know to build their own machines, and it is all freely available and free to share. A single dvd is a civilization starter kit.

The GVCS is in its infancy, and is already attracting a lot of attention and support. Check out this two minute video to see [some of the machines in action.](#)

United States Postal Service

The United States Postal Service's Product Tracking System (PTS) runs on Linux mainframes. In 2009 they migrated from over 1,300 Sun Solaris servers

to HP mainframes running SUSE Linux. As a result costs went down and performance and capacity went up, tracking over 40,000,000 transactions every day.



Tux lounges in a sorting tub
Source: Carla Schroder

The USPS is not new to Linux, and has been using it in key roles for years. In [1997 they migrated their OCR](#) (optical character recognition) mail-sorting from Digital Equipment VAX systems to 900 commodity x86 Linux systems at 250 sorting centers nationwide. The OCR system has to read handwritten addresses, and the Digital Equipment systems were not up to the job. The Linux systems, which are stripped-down with custom kernels, can read both machine print and handwriting, do zip code lookups, and capture grayscale images at high speeds. They could do this even back in the late 1990s. The Linux PCs are faster, more accurate, cheaper, and considerably more flexible, as both the software and hardware can be upgraded and modified inexpensively.

Alek Komarnitsky's Christmas Lights

Back in 2002, Alek Komarnitsky perpetrated a little Christmas prank. He set up a Web server and claimed that site visitors could watch his Christmas lights in real-time via Webcam, and control his Christmas display by clicking buttons on the Web page. But it wasn't so. In reality, he had set up a simulation with a series of still photos that changed frequently, giving the impression of remote control. There was no Webcam and no remote control. But the news media got wind of the story, and were all over it without bothering to do any

fact-checking, and happily reported it as real. The high point of the hoax was when Alek got a ride in an ABC news helicopter over his house, with his wife inside manipulating the lights.

The story went global, so Alek had to come clean and [confessed the truth](#) to the Wall Street Journal right after Christmas in 2004.

But for 2005, he decided to make the remote controls real, and so he did, using X10 controls, three Webcams, and a LAMP stack. These control tens of thousands of lights and inflatable characters like Homer Simpson, Santa, and the Incredible Hulk. He also set up a live Webcam in his Santa's Workshop. He calls it [Alek's Controllable Christmas Lights for Celiac Disease](#), because it has evolved into a fundraiser for the University of Maryland Center for Celiac Research. To date he has raised over \$60,000.



Merry Christmas from the three wise men, Elmo, SpongeBob, and Homer Simpson

The site is active from post-Thanksgiving to Christmas, and for fans who can't get enough there is also [Alek's Controllable Halloween Decorations for Celiac](#)

[Disease](#). This has a fun cast of characters like a herd of Grim Reapers, Sponge Bob Squarepants, pumpkins, ghosts, skeletons, and more Incredible Hulks. For Halloween, Santa's Workshop is transformed into the Haunted Office. It is all about having some fun, and raising money for medical research.

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