



Sharing Free Knowledge to Save Humanity

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HOW TO SAVE HUMANITY

Essays and answers from the desks of futurists,
economists, biologists, humanitarians,
entrepreneurs, activists and other people
who spend a lot of time caring about, improving,
and supporting the future of humanity.

HELLO FRIEND

This book is an effort to highlight the most pressing issues facing humanity today and present potential solutions to these challenges in the near future.

In it you will find the knowledge, thoughts, fears, and hopes of scientist, humanitarians, economists, social entrepreneurs, futurists, and many others who spend a lot of time and efforts towards improving our future.

I hope this book lets you find new ways you can take action on supporting the future of humanity.

With kindness,
Janet Alexandersson

Facilitator of [How To Save Humanity](#)
Founder of [Basics.Is](#)

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Sharing Free Knowledge to Save Humanity

Anyone paying attention to global conditions knows humanity has severely under-invested in both social justice and sustainable development. A quick review of global environmental conditions and extreme wealth concentration results in a rather bleak outlook for the sustainability of the world's major ecological and democratic political systems. A few lucky individuals amass unprecedented fortunes by hijacking ideas and knowledge itself as “intellectual property” and the concomitant productivity gains. This not only slows technological progress in the scientific fields of the future like nanotechnology, but it also encourages rent seeking for the resultant monopolies that bleed wealth and political power from the middle class. Worst of all it keeps knowledge out of the hands of the people that need it the most: billions of people are mired in abject poverty. Even the majority of people in the rich countries find their economic situations uncomfortably precarious. Everyone suffers the consequences of our current system of knowledge distribution in the forms of environmental degradation and climate destabilization. There is a clear need to do a better job of caring for our common home.

The future, however, is not entirely bleak. People that genuinely care about the future of humanity like the authors of this book and even those in positions of great wealth and power, have

begun to make the transition to more resilient and sustainable technologies and equitable means of knowledge sharing. Billionaire Elon Musk, the CEO of Tesla, freed his company's intellectual property related to electric vehicles attempting to accelerate more rational use of technology. Others have started to aggressively free knowledge and start ambitious projects to move civilization itself towards an open source ecology. As our whole society begins to make the slow turn toward sustainability, swarms of individuals, families, NGOs, entrepreneurs, and small businesses have already rounded the corner. Until recently, they had to develop the sustainability knowledge alone in their own community – essentially reinventing the sustainable wheel again and again. This is hard work and frustratingly slow in the face of looming catastrophes.

Fortunately, global communication technologies have matured and the Internet now provides a way around this lack of collaboration and access to critical information for sustainable development for all. The solution is found in the rapid innovation created with the use of open source appropriate technology (OSAT).

Here, “open source” refers to the methods created by the vibrant and burgeoning free and open source software movement. This movement gave us thousands of free programs and Linux, which essentially runs the Internet itself - providing the foundation for

the massive companies you use every day (I.e. Google, Amazon, etc.).

“Appropriate technologies”, on the other hand, are easily and economically utilized from readily available resources by local communities to meet their needs. What is appropriate varies by where you live as these technologies must satisfy the boundary conditions set by environmental, cultural, economic, and educational resource constraints of the local community. Often, and particularly in the developing world, these technologies are small scale, elegant, and simple yet provide for people's needs without destroying the capacity of the Earth to support life.

OSAT harnesses the power of distributed peer review and transparency of process. All of us are smarter than any of us and when we get together to share knowledge the results are impressive. Appropedia is an excellent example of OSAT development. Appropedia is a wiki-based website, like Wikipedia, where a large number of participants create and modify the content directly from their web browsers. All the information (e.g. designs, plans, how tos, instructions, advice and journal experiences, etc.) developed is free for others to use to solve their own sustainability problems. Wikipedia grew exponentially, and is now one of the top ten sites on the Internet with content created by thousands of volunteers objectively beating the efforts of multi-billion dollar international companies. In the same way,

OSAT shared on Appropedia and other sites hosting peer to peer (P2P) libre knowledge is becoming a true rival to the paradigms of the development of technology that have dominated civilization since the industrial revolution. A new revolution, built on a dispersed network of innovators, inventors, researchers and “makers” working together to create a just sustainable world is being created.

If you want to help in this effort to save humanity, you can join as you are probably already a maker if you are reading this book. Nearly every family's refrigerator is plastered with our children's wonderful creations. Children relish “making” naturally, but growing up many lose some of this joy of creation as economics has favored purchasing mass-manufactured products over making them ourselves. Thus many of us have become impotent consumers rather than vibrant makers. For a long time, this seemed to be the only way. However, these monetary calculations are changing. As DIY tools for digital fabrication have proliferated over the Internet, you can now make surprisingly sophisticated “products” in the comfort of your own home for yourself and your community.

This open source hardware is becoming mainstream simply because of economics. In the process this knowledge will not only save

us, but change us into more sharing, more creative, happier and wealthier people.

For example, costs of 3-D printers recently plummeted because of the open sourcing of a 3-D printer that could print most of itself called a RepRap (short for self-replicating rapid prototyper). The RepRap's brain is an Arduino, an inexpensive open source electronic prototyping platform developed by another group. Since then hundreds of people have shared their variations of both technologies and the innovation churn has become staggering. \$2,000 RepRaps can out-perform what \$20,000 proprietary commercial 3-D printers could do only a few years ago. There are dozens of companies like RepRapPro and Lulzbot selling pre-assembled open source RepRaps and they can also be built for less than \$500 in parts from free plans. Perhaps most importantly, they can print OSAT as the Field Ready recently demonstrated in Haiti.

In the same way as aggressive mass-scale sharing improved 3-D printers, people are sharing free and open source information and digital designs of everything from inexpensive science learning aides and medical marvels to tools for organic farmers and things for your home. The collections of hundreds of thousands of designs are growing exponentially. Every new design that is shared makes owning a DIY 3-D printer or other form of digital production tool (e.g. a laser cutter) that much more valuable and

drops the costs for everyone.

A recent study showed a typical American family can print 20 common household products from a pound of plastic for \$18 using free information, saving between \$300 and \$2,000 in purchases. There was nothing special about the 20 products (e.g. kitchen gadgets). They were just things university students wanted to solve their problems and an insignificant fraction of the other free designs already swarming the Internet. The 3-D printed products were better than what is available in any store as they can be customized and personalized. These 20 things could be printed in a weekend and literally pays for the 3-D printer in cash savings for the people. This kind of distributed manufacturing (even if it is not a solar-powered 3-D printer) is also good for the environment. They solve sustainability problems the market is ignoring (like glasses for poor kids or inexpensive solar racking), because the people that need them most live in poverty. But that is if you use commercial plastic, which normally costs ~\$16/pound. There is an open source recyclebot, which turns recycled plastic into 3-D printer feedstock for only a nickel per pound in electricity! No modern robber-baron and his sweat shops can compete with that – and it is even really good for the environment. The list of printable materials is expanding rapidly, providing makers with even more flexibility to solve problems in their communities. For example, there is already a sub-\$1,200 RepRap that can print metal. Makers are not stopping there. By combining inexpensive open source electronics from companies

like Sparkfun, 3-D printed mechanical components can be turned into incredibly valuable products: everything from quad-copters for emergency rescues to submersible robots to test water quality. Even expensive lab equipment can be made for pennies. These products are better than anything on the market or they are personalized items that never existed before. This free knowledge helps drive an incredible return on investment for future innovation, while giving humanity a fighting chance at solving problems in any given location. It also puts wealth (perhaps without money) back in the hands of the bulk of humanity.

In the not so distant future, you will run your waste plastic and aluminum cans through the dishwasher, shred and extrude them in a recyclebot to turn them into 3-D printer feedstock. You will power the whole thing with sustainable solar photovoltaic equipment on your roof. The marginal cost will drop to about zero for you to print a lot of the products you need using free designs on your RepRap 3-D printer (including its upgrades!). This will help you solve some of your problems, save you money, and perhaps make you happier. The fun part will, of course, be the making – creating your own designs, automating them with open source electronics, decorating the sad products of one-size-fits-all mass production, developing derivatives and mash ups of other's work, personalizing gifts and getting the joy back from child-like creation. You will share your designs and the knowledge of how to make and use them freely with others for fun and have access to increasingly sophisticated knowledge about everything (again, for

free). Plus, everything you share could help someone else pull themselves out of the misery of scarcity to do the same – perhaps somewhere else in the world where they are less fortunate than you. This feels good too.

I can not wait to see what the refrigerator's of the future look like as an entire global generation of makers are born into households with access to shared and completely free knowledge. Then we will not only save humanity, we allow it to thrive.

