

Public Invention

Robert L. Read

August 6, 2021

Public Invention, a US public charity

If you want to build a ship, don't drum up the men to gather wood, divide the work, and give orders. Instead, teach them to yearn for the vast and endless sea.

– Antoine de Saint-Exupéry

Preface

This is a draft work whose purpose is explain and promote Public Invention as a movement and philosophy. My hope is to create a coherent and convincing work. This work will likely be published electronically by Public Invention (the organization), but we will also seek a print-publisher who is willing to keep the work open access.

– Robert L. Read

Contents

Contents	iv
THE JOY OF PUBLIC INVENTION	1
1 “Invent in the public, for the Public.”	2
2 The Joy of Public Invention	4
3 Why it makes more sense than in the past	6
4 Social Inventions	8
5 Imagining what it will be like	10
6 Universal Salvation	11
7 The Christian Point of View	12
8 Building a Public Invention Commons	13
9 Public Invention as an Organization	14
HOW TO BE A PUBLIC INVENTOR	15
10 How to be a Public Inventor	16
11 The Emotional Intelligence of the Public Inventor	17
12 What if you cannot be a Public Inventor?	18
12.1 How to Start a Public Invention and Humanitarian Engineering Club at your University . .	18
Humanitarian Engineering	18
Starting a PIHE Club	18
What a PIHE Club Should Do	19
What the Students Should Get Out of a PIHE Club	20
PUBLIC INVENTION IN THE 2020s	21
13 Public Invention 201: Essential Skills	22
14 The Technological Landscape	23
15 Selected Invention Ideas	24
HOW PUBLIC INVENTION OPERATES	25
16 The Invention Team Model	26

17 Sharing Immediately and Broadly	27
18 The Public Invention Licensing Policy	28
19 Why Public Invention is the best teacher, but is not an educational organization	29
20 Supporting Material Costs	30
21 You Can Help	31
Bibliography	33

List of Figures

1.1 The Rise of Public Invention as a Third Pole of Progress	2
--	---

List of Tables

THE JOY OF PUBLIC INVENTION

“Invent in the public, for the Public.”

1

Benjamin Franklin (1705-1790) did not patent the Franklin stove because he believed it to be too useful an invention to legally encumber. Benjamin Franklin has been called “The First American”[1], but I think of him as the first Public Inventor. If you read the autobiography of Nikola Tesla (1856-1943) “My Inventions”[2], you discover a devout public servant (in a non-denominational sense), who certainly wanted to make money but whose deepest motivation was to see human progress. R. Buckminster Fuller (1895-1983) wrote extensively on the act of invention as a moral act: nerve gas is bad, vaccines are good[3]. Richard Stallman (1953-) articulated the principles of free software and in so doing indirectly increased the wealth and well-being of the planet tremendously[4]. This book is my attempt to extend and promote the work of those inventors to create a stronger movement which we could call Public Invention.

Invention is the most spectacular way to advance human progress. It is odd that our politicians mostly ignore it. The story of human history is largely a story of technological advance careening forward from the stone age with a speed which is inexorably, and frighteningly, building, perhaps to a climax. Those who believe it will end in a dark and terrible destruction are not fools; but that fate is not certain. We as a planet can choose instead to build a bright future in which humanity explores the universe together in peace. This will happen only if we understand technology as the powerful moral force that it is.

For the last 100 years, technological advance has been driven by two engines: profit and academic research. The modern emphasis of Universities of patenting research and the governmental practice of subsidizing research which is monopolized by for-profit firms has blurred the distinction. Nations have long recognized the value of technology for competing with other nations via war or mercantilism. Public Invention hopes to be a movement that does not replace for-profit research and academic research, but becomes a third engine. The motto of Public Invention is “Invent in the public, for the Public.”

This means the Public Inventor does not seek monopolies in the form of patents or other intellectual property but gives an invention freely to the whole world without prejudice. Anyone is free to use the invention, including for the purpose of making a profit, but nobody is giving the privilege of exclusive rights to it.

Buckminster Fuller made a clear distinction between what he called “killingry”, or weapons, and “livingry”—that which increase the good in the world. The Public Inventor must not build weapons. This is impossible to do perfectly. Even a pillow can be used as a weapon. Nonetheless, technologists are not relieved of the duty to invent good things instead of bad things just because it is intellectually difficult to decide what is good and what is bad. The Public Inventor accepts this burden as does the best they can.

Benjamin Franklin said, “We must, indeed, all hang together or, most assuredly, we shall all hang separately.” His wit was poignant because

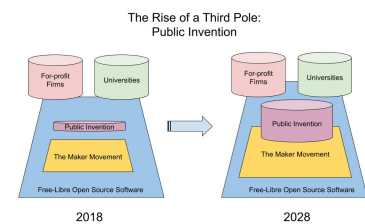


Figure 1.1: The Rise of Public Invention as a Third Pole of Progress

he meant the American revolutionary leaders would indeed have swung from a British rope for treason if the Revolutionary war had been lost. But in 2021 his words still ring true. Buckminster Fuller believed that humanity would either destroy itself or have a bright, Star Trek-like future—there is no middle ground. We cannot continue to muddle along taking weak action on global warming. The COVID-19 pandemic has shown that we are all connected in a most intimate way, whether we like it or not. A disease incubated in my body may kill you, and vice versa. Therefore the Public Inventor must at some level seek the wealth and well-being of the whole world. Narrow national chauvinism is no longer a useful or profitable behavior.

We could define Public Invention simply as invention in the public interest. In that sense, it is closely related to humanitarian engineering. Humanitarian engineering requires a great deal of problem-solving, innovation, and ingenuity. The distinction is that "invention" means something truly novel which has never existed before. Public invention values the truly novel, whereas humanitarian engineering values the truly useful.

In the future, it will be common place for people to move freely between the three engines of for-profit firms, academic research, and public invention. Public invention will not replace the other two engines, but augment them. Public invention is a moral act, but it is not a moral duty. Some people will want to be public inventors some of the time.

The Joy of Public Invention

2

Public invention takes the joy of invention and multiplies it by the joy of helping others. Making something truly new is a roller coaster ride of emotions. The inventor is fraught with doubts. Is the invention even possible? Has someone done this earlier? Am I too stupid to accomplish this? Often a new idea creates innumerable frustrations. The expensive equipment breaks at a critical moment. There may be collaborators, but there are no experts to turn to, because by definition the invention has never been made before. Despite all of the doubts and frustrations, or perhaps because of them, the eventual progress, if it comes, is an intense joy.

Comic books and movies have taken a grain of truth and mythologized out of proportion to create the trope of the lone inventor. Most invention is done by teams. Math, is, in the end, always social. The joy of collaboration is part of the attraction of being a public inventor.

Each of us is unique and has unique gifts to bring to the table. In a sense this is true in any part of life, but it is especially true in the act of invention. Each of us has a different voice, even if we sing the same song. However, by definition, invention is making something not just new in the sense of a variation of something old, however unique, but new in the sense of breaking new ground. An invention is not yet another rose, it is a new kind of flower. Even mediocre inventors such as myself are essential and necessary. The mediocre work makes the great work easier.

Some people have an invention inside them that has to get out. The seed of an idea planted in childhood may mature in the unconscious until the time is right for it emerge. Sometimes this is because of a person's great love of something. We have all seen people enchanting by flying or infatuated with light. Some people can spend years entranced by a math problem. The inventions may be useful, but unprofitable. Some may even be potentially harmful. Certainly many men, including myself, are fascinated by shooting things at high velocity, such as in guns or rockets or bows or catapults or water guns. So long as the invention is not designed to harm, the invention should be allowed to be born. The line between invention and art is sometimes blurred. The public inventor should support whimsical inventions when a person has a strong desire to make it.

The public inventor should not make fakes or toys. That is, the public inventor should make an object whose value is that it is a miniature version of some other object or like some other object which has intrinsic value. Making a model of a beautiful airplane or ship is valuable and fun, but it is not invention. Making a fake starship is not invention.

However, the desire to make something new even if the utility of the invention is hard to define should be respected. This may be because it is artful, or may have nothing to do with art, and its value may lie in some other dimension. Often, an invention that wants to be made that has no clear purpose is a forerunner of something else which cannot be conceived until the first invention is real and can be held in hand.

To me, public invention is really about love—love of humanity, of beauty, of the planet, of math, and of my fellow-inventors. For some of us, the joys of learning, collaboration, invention, and helping the world melded together in public invention is the greatest joy we can imagine. At the end of my life my proudest achievement will be my children, and my second greatest sense of joy will come from the inventions I have given the world, however small they may be.

Why it makes more sense than in the past

3

Participation in public invention makes more sense with each passing decade. Although we suffer from inequity, in raw terms the world is more abundant than ever before. Commodities are cheaper. Fewer people live in poverty. The number of people who are financially able to take a few months out of the work force to work on a public invention project without compensation is higher than ever. People are more generous than ever before. The number of people who make a substantial income essentially through patronage and tipping is probably higher than ever before. In a world of abundance, the need to make a profit or to work relentlessly at a career should become less imperative.

In America today, housing in large cities and formal education are exceptions to the general trend of things becoming cheaper and easier to obtain. Participating in public invention is a powerful way to obtain two things provided by a formal education: the learning and reputation.

There are specific technical reasons certain kinds of public invention are far more accessible than ever before. In the first place, the internet has made many tutorials and how-to documents available almost for free, from how to use a soldering iron to very sophisticated academic papers. Secondly, the free software movement has made an ocean of high quality software available. Although it takes effort, almost any computing task can now be accomplished without paying a cent for software. It remains the case that some of the best scientific tools do not yet have free-gratis alternatives of similar quality, but the trend is incontrovertible: the cost of computing is getting cheaper. I'm writing and typesetting this book right now using mostly free software tools. This same software generally also makes it cheaper to build new software. Usually, software that is free as in free-pizza is free as in free-speech—meaning that anyone has the freedom to use it as a starting point for making something new. Software has limitations, but it is extraordinarily versatile. It is the most general-purpose of all technologies. The fact that it is free is a fundamental enabler of public invention, because capital attracted based on expectations of profits is not needed.

Hardware is more expensive, but has gotten dramatically more accessible at a low price. 3D printers that cost USD\$300 can now do astounding things that were not even possible 30 years ago. Similarly, it is now possible to design printed circuit boards on free software and have them fabricated at very low costs, usually in about two weeks. This capability augments the old-fashioned but still useful soldering iron as a means of making sturdy circuits. Of course the reduction in the price of computers, which includes single-chip micro-controllers used in electronic embedded systems is legendary.

Although I am weak on bio-hacking, I believe the same expansion of capability at reasonable cost has occurred in the world of biology and biochemistry. Even optics, in the form of microscopy and telescopy, has seen major improvements.

Batteries and solar power have enabled deployment of electronics portably and to remote off-the-grid locations. Significant improvements in cameras, sonar, and other sensors have also increased the sophistication available at low cost.

(Create Matrix/Infographic of relative acceleration in fields.)

Although hardware cost remain a relative impediment (see Chapter 20 for Public Invention's policy), the combination of cheap hardware, free software, and cheap connectivity has made innovation and invention much easier. Sharing and publication of inventions is a critical part of public invention, and that is also now easier than it has ever been.

Advances in “hard” inventions have made public invention easier, but “soft” inventions also play a role. In particular, practices pioneered by the Free Software movement, such as the way projects can self-organize and use free software and hardware licenses, enable running a project and sharing it freely.

The free and open-source software has developed a set of cultural practices that allow teams to work together. These include:

- ▶ cultural dissuasion of unnecessary splitting or “forking” of a project,
- ▶ using recognition as an incentive for contributions,
- ▶ using version control systems to manage contributions,
- ▶ and using Agile software methods and big visible charts to manager work.

An additional practice is that documenters and maintainers are valued nearly as highly as software coders here. This is a cultural practice which is of paramount importance to public invention as a movement. Often, an invention has a kernel of math or ingenuity that can only be created by someone well-versed in the appropriate science and art. However, public invention is a team sport. Every contribution must be honored and valued. In some sports, some positions naturally have more opportunities for drama—the striker on a football team, the pitcher on a baseball team. But teamwork is essential to winning. Those who manage projects, write documentation, help with quality assurance and provide financing are equally important.

The value of these cultural inventions cannot be overestimated. But the creation of the GNU General Public License (GPL) is of equal importance. The GPL is brilliant in its simplicity: it gives the user the right to modify and distribute a copyrighted work and works derived from that a copyright work so long as the distributor does not attempt to monopolize the works and gives the derived work freely under the same terms. The GPL and related Creative Commons licenses give creators control over how their work is used. In particular, they may choose to enable re-use, which is the point of public invention.

There are also reciprocal licenses for hardware. Hardware designs are not covered by copyright, and so they are fundamentally different. However, this is of no concern to the public inventor, who as a matter a principle is giving away the invention for the whole world to use freely. It would be nice of those who take a device and made improvements to it would contribute those improvements back to the project and the world as the GPL forces in software, but at present our legal structure for doing this is weak. We may, however, rely on the “honor system”, which can be astoundingly effective in practice.

- ▶ Practices pioneered by the Free Software Movement
- ▶ Internet community
- ▶ Open Source Software paved the way with certain teachings
- ▶ Projects need leaders
- ▶ Projects run on the coin of acknowledgement

“The Apache Way”<https://www.apache.org/theapacheway/> is a valuable starting point, as is “Homesteading the Noosphere”<http://catb.org/~esr/writings/homesteading/homesteading/> and my own work, “How to be a Programmer” <https://github.com/braydie/HowToBeAProgrammer>

Eric S. Raymond has explained this in his essay “How to Become a Hacker” in in the “Status in the Hacker Culture” section<http://www.catb.org/~esr/faqs/hacker-howto.html> [Raymond1999]

The work of the Richard Stallman and the Free Software Foundation in the creation of the GPL has inspired many other licenses practically created the field and practice now called “free culture”. This goes far beyond the GPL, but we can use the GPL as the originating event for these other licenses.

- ▶ Maintainers and documenters are highly valued (quote ESR)
- ▶ Licensing matters, but has been pioneered

Imagining what it will be like

5

- ▶ Infographic of the third pole
- ▶ Smooth flow into and out of for-profit business
- ▶ Profit becomes one of many tools
- ▶ Easy to find a project that resonates
- ▶ Easy to contribute something
- ▶ But invention will always be hard, or it is not invention.
- ▶ Replace vanity with gratitude
- ▶ Imagining an altruism driven project landscape
- ▶ Art and play in its place rising above infantilism
- ▶ How to Achieve a World of Public Invention
- ▶ An Ocean of Interesting, organized projects
- ▶ A community of sharing
- ▶ A means of getting of financial help
- ▶ A means of getting mentorship
- ▶ Judgement where it belongs

- ▶ Small is Beautiful
- ▶ The road to the stars runs through villages and slums
- ▶ None of us are free until all of us are free
- ▶ Anthropomorphised money does not love poor people
- ▶ Nor does it love rich people.
- ▶ It wants to accumulate.
- ▶ But people love people—we can motivate volunteers this way
- ▶ We cannot live together on spaceship earth while we have grinding poverty
- ▶ Cutting your own carbon footprint in isolation is of limited value compared to political action—yet we are “sold” such ideas.

The Christian Point of View

7

- ▶ Jesus never touched a soldering iron, but a soldier's iron touched him.
- ▶ Love your neighbor as yourself. (Matthew 22:35-40) – the second half of the great commandment
- ▶ The first part of the great commandment implies that all science is theology. By studying his works we study God; there can be no love without knowledge.
- ▶ The second commandment requires sharing and egalitarianism.
- ▶ If we are called to be little Christs, and God cares for every sparrow, then we must as well.
- ▶ Talents must not be buried, and surely those of us who can be inventors have a talent: Matthew 25:14–30 Pauline comments: Whatever your hand finds to do, do with all your heart. (Ecclesiastes 9:10) Each has separate gifts: (Ephesians 4:11-16)
- ▶ We are made in God's image; and is not God a Maker and Inventor and Mathematician?

Building a Public Invention Commons

8

- ▶ The value of a Commons
- ▶ The value of Commons of Problems
- ▶ The value of a Commons of Solutions
- ▶ Don't worry, be crappy.

8.1 Public Invention as an Organization

This book is an attempt to create a movement called public invention. I have also created a public charity of the same name. Public invention, the movement, has always been and will always be more important than Public Invention the organization. Organizations come and go. You are free to create a different organization to support public invention, and I hope you do. Why then have such an organization at all, when it is clearly not strictly necessary?

Hardware invention and non-theoretical science projects require more capital outlay for tools and consumable supplies than pure software and math projects. Once a project starts to spend a significant amount of money, it is useful to have a formal business organization. People who want to support a project want to know the money is not spent negligently. Being a non-profit registered by the IRS makes gifts tax-deductible for some givers in some circumstances, which may increase donations.

Maintaining a list problems or projects worthy of effort is extremely valuable. Plenty of very valuable organization of entire fields is done by diligent individuals. However, some work requires input from several individuals, and this work must be judged and evaluated in some way which is best served by an organization. In particular, the attention of any one individual is limited in time. Some projects and work demand to be sustained across periods of time longer than a human lifetime. Organizations can support such work better than individuals.

Newcomers benefit from an obvious starting point. An established organization provides such a starting point, even if the newcomers later develop their own interests which take them away from the organization.

Of course there is always a danger that an organization will attempt to control or monopolize a project or even a problem space, or worse, a group of people. In such cases, creating an alternative or competing organization may be required.

Sadly, it may be necessary to have organizations which conduct business in different human languages or in different geographic regions. In a sense, it will be a great validation for public invention (the movement) when someone feels it is necessary to create an alternative to Public Invention (the organization).

Public Invention, Inc., is a US 501c3 tax-deductible public charity.

For example, "Ten Semi-Grand Challenges for Quantum Computing Theory" by Scott Aaronson
[TenSemi-GrandChallengesforQuantumComputingTheory](#)

HOW TO BE A PUBLIC INVENTOR

How to be a Public Inventor

9

- ▶ Motivate yourself through love of humanity, life, and knowledge
- ▶ Publish early and often
- ▶ Don't seek patents
- ▶ Publish your failures
- ▶ Seek community
- ▶ Help other Public Inventors
- ▶ Ask for Help
- ▶ Learn by doing
- ▶ Failure in service to a big idea plants the seeds of success.

The Emotional Intelligence of the Public Inventor

10

- ▶ Getting to the Coal Face
- ▶ What to do when you are scooped
- ▶ Dealing with publication
 - Rejection
 - Timeliness
- ▶ Surviving being foolish
- ▶ Investing in learning without pedantry
- ▶ Feeling unappreciated and ignored
- ▶ Fuller's theory of technological maturity and ripeness
- ▶ The need for friendship and siblinghood
- ▶ Feeling ripped off
- ▶ The siren-song of closed intellectual property
- ▶ Patent envy and the patent mystique
- ▶ Dealing with disappointing teammates
- ▶ The insecurity of insignificance
- ▶ Competition is obsolete
- ▶ St. Exupery's comfort of mediocrity - 20 bad sculptors are needed
- ▶ "A walk-on part in a war or a lead role in a cage"
- ▶ Paul's call for each to do their part: Ephesians 4:11-16
- ▶ Small is beautiful
 - Giants are built from small accomplishments, as long as they are published.
 - Thinking small is often a useful constraint.
 - Nothing does big things as well as doing small things.

What if you cannot be a Public Inventor?

11

- ▶ Give moral support.
- ▶ Give money in a way which is spiritually meaningful to you.
 - A small amount given to a small project is incredibly impactful.
 - People aren't compensated, but paying for equipment has a multiplier effect
 - It is psychologically important.
- ▶ Try to put yourself in a position that you can
 - Educate yourself.
 - Become financially sound—remove the desire for luxury

11.1 How to Start a Public Invention and Humanitarian Engineering Club at your University

One of the most impactful things you can do is to start a Public Invention and Humanitarian Engineering (PIHE) club at your University. (We recommend that PIHE be pronounced "PIE-hee"). Although one could of course start a club devoted solely to public invention, by including humanitarian engineering the appeal is broadened.

Humanitarian Engineering

Humanitarian engineering was first offered as a minor by the Colorado School of Mines in 2003. Organizations like Engineers Without Borders (EWB-USA) have made it a nationwide activity with over 300 chapters (see map below, or [click here](#)). The blue dots are EWB chapters, many of which are student chapters associated with Universities, and the red dots are community projects within the USA. EWB-USA focuses heavily on civil engineering (e.g. clean drinking water projects) in low and middle income countries. The COVID-19 pandemic, however, has made both the need for and abilities of humanitarian engineering clearer. Helpful is one of several volunteer organizations created in response to COVID-19 dedicated to humanitarian engineering. Humanitarian engineering has leveraged advances in digital manufacturing and open source sharing of designs to aid the world by creating personal protective equipment (PPE) and even sophisticated medical devices like ventilators. There is a need for humanitarian engineers in every kind of engineering discipline.

Humanitarian Engineering, [is the] the application of engineering to improving the well-being of marginalized people and disadvantaged communities, usually in the developing world.[6]

Starting a PIHE Club

Public Invention and Humanitarian Engineering are both movements that seek to use human ingenuity to help society and the planet. There are always highly motivated students interested not only in learning and increasing their earning power, but also by a desire to help their fellow beings and move society towards a sustainable state. These students

deserve a place to congregate, socialize, learn and teach together. The project-based nature of Public Invention and Humanitarian Engineering movements are a great way for students to be mentored and gain practical experience to augment their studies. We think every University should have a Public Invention and Humanitarian Engineering club.

At most schools, the students have the power to start a club simply by asking to do so, sometimes by filling out some paperwork to assure the safety of the students and that the club accords with the principles of the school. The university usually lets the club meet in a classroom or other room, and sometimes provides a small amount of money for things like pizza.

A student-formed organization may require a faculty advisor, and sometimes a minimum number of students to serve as the initial officers of the club. Usually, a statement of the purpose of the club will be required. We recommend that you use some variant of this purpose:

The purpose of the [your university name] Public Invention and Helpful Engineering club is to explore and support the use of technology for the betterment of humanity and the planet, particularly how technology can address problems not being addressed by the private sector.

You do not need the permission of anyone outside your school to start a PIHE club, and your club doesn't have to follow any dictates that it does not itself choose. Every club can be independent. You are encouraged, however, to inform us at Public Invention (email: <read.robert@pubinv.org>) so we can give you a shout out as well as connect you to other club directors and presidents. We will help you find speakers and mentors as well.

Here is the preamble drafted at the University of Texas at Austin club:

The local Austin Public Invention and Helpful Engineering Chapter is intended to support student awareness and participation in humanitarian engineering projects and free, open-source inventions with the public interest in mind.

What a PIHE Club Should Do

Whenever two or three people are gathered together, a spirit arises which is greater than the individuals. A PIHE club doesn't have to do anything beyond talk about the ideas of Public Invention and Humanitarian Engineering. But a PIHE club could also:

- ▶ Invite speakers to talk specifically about PIHE concepts, practices, and projects. Public Invention will be happy to come speak at your club!
- ▶ Take on real projects that can really make a difference. The organization Public Invention has published a growing curated list of such projects analyzed for difficulty, joinability, and skills that you can use as a starting point.
- ▶ Interact with a local Engineers Without Borders professional or student chapter, or consider starting one!

- ▶ If not ready to do a real research project, take on a learning project to improve your PIHE skills, such as building an open-source device useful for humanitarian purposes.
- ▶ Brainstorm new public invention ideas, and contribute those ideas back to the public invention list of ideas.
- ▶ Invite discussion of the philosophical, religious and ethical aspects of PIHE.
- ▶ Seek out ways engineering and technology can help in your local community, such as:
 - Mapping invasive species,
 - Providing sanitation to the homeless,
 - Recycling plastic with recyclebots into 3-D printing filament,
 - Measuring and decreasing the local carbon footprint, etc.

Of course, you can probably think of a dozen other useful and fun things! EWB student chapters have a very well-defined way to make a big impact by working with local low-resource communities internationally, but a PIHE club does not have to be structured that way. Your PIHE club will not be a chapter of a larger organization, so you are free to focus wherever you like. Some clubs may wish to focus on real-world project-based learning. Other clubs may want to chat about how an engineering career can be part of PIHE. Some clubs may focus on the environment, others may focus on poverty and inequity. What they all share in common is that they share their inventions and development to the commons!

What the Students Should Get Out of a PIHE Club

Although every club may be different, the students of a PIHE club should obtain certain benefits:

- ▶ The joy of sharing a common interest with your fellow students.
- ▶ The satisfaction of helping others, even if that help is abstract and potential, existing in the future rather than today.
- ▶ Learning how technology can positively affect the real world.
- ▶ Understanding the open-source and free culture movements.
- ▶ An introduction to modern project management tools such as git<https://git-scm.com/>, GitHub<https://github.com/> and GitLab<https://gitlab.com/>, and Appropediahttps://www.appropedia.org/Welcome_to_Appropedia.

If a PIHE club is ambitious enough to undertake its own humanitarian invention project, perhaps with the help of a professor or Public Invention, then students can expect mentors, real-world experience, practical motivation of their studies, and a great project to talk about in a job interview or when applying to graduate school.

PUBLIC INVENTION IN THE 2020s

The Technological Landscape

13

I parts of this book will be read in the year 2100, but this chapter will be obsolete.

Selected Invention Ideas

14

“The world is full of interesting problems to solve.” – Eric S. Raymond

HOW PUBLIC INVENTION OPERATES

Why Public Invention is the best teacher, but is not an educational organization

18

- ▶ People learn best by doing.
- ▶ We don't do exercises, fakes, or toys
- ▶ Learning has an enormous social component
- ▶ Learning is a precessional outcome of Public Invention activity

You Can Help | 20

Acknowledgements

Joshua Pearce, Sabia Abidi, Avinash Baskaran and Megan Cadena co-authored an essay which was the basis of section 12.1.

Bibliography

Here are the references in citation order.

- [1] H. W. Brands. *The First American: The Life and Times of Benjamin Franklin*. Doubleday, 2000 (cited on page 2).
- [2] Nikola Tesla and Ben Johnston. *My Inventions: The Autobiography of Nikola Tesla*. Experimenter Publishing Company, Inc., and Hart Brothers, Williston, Vermont, 1982 (cited on page 2).
- [3] R. Buckminster Fuller. *Critical Path*. St. Martins Press, 1981 (cited on page 2).
- [4] Richard M. Stallman. *Free software, free society: Selected essays of Richard M. Stallman*. GNU Press, 2002 (cited on page 2).
- [5] Brenda Laurel. *Utopian Entrepreneur*. MIT Press, 2001.
- [6] Wikipedia contributors. *Humanitarian engineering* — *Wikipedia, The Free Encyclopedia*. https://en.wikipedia.org/w/index.php?title=Humanitarian_engineering&oldid=1026730841. [Online; accessed 6-August-2021]. 2021 (cited on page 18).