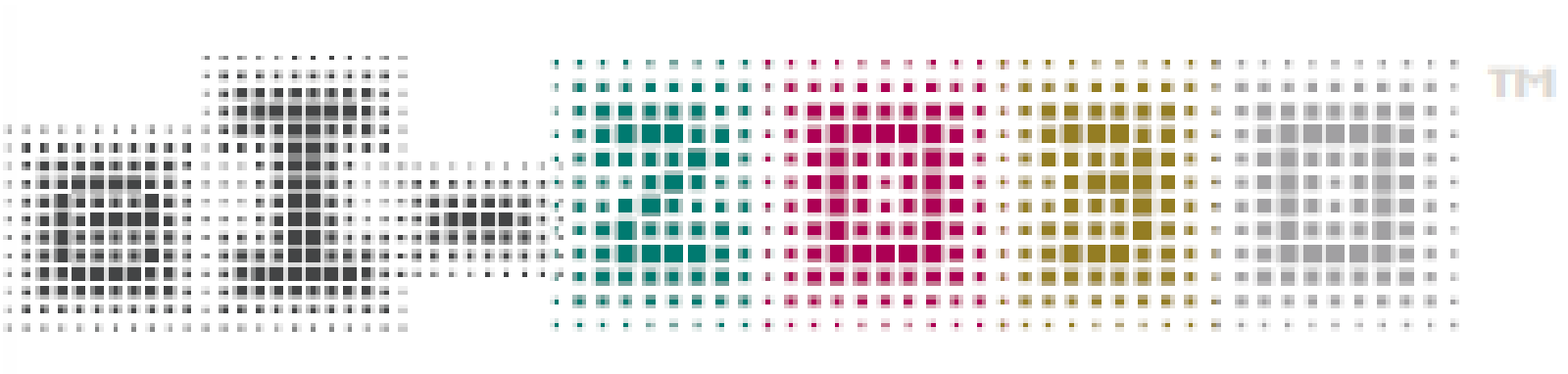


Community Built E-ink Laptop Project

Alexander Soto
Project Lead
Core Team

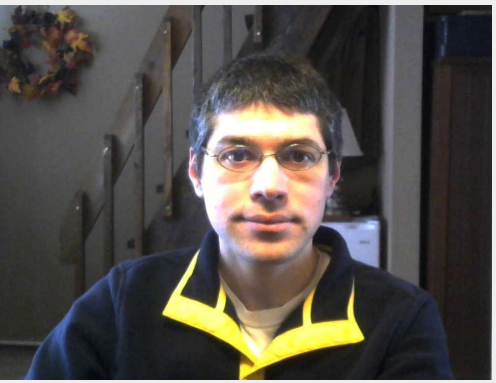
I’m a community organizer, educator, software engineer, hacktivist, and agent of social change.

My interests are in exploring community-building, social justice, education, and leveraging technology to address social problems.

In the past, I’ve worked as a labor rights organizer, a teacher, and I’m currently an Expert In Residence at Resilient Coders.

@asotodev alexsoto.dev

contact@alexsoto.dev



Giovanni Lostumbo
(aka ”scrunch”)
Core Team

I'm an independent contractor- I provide tech support services to IT companies.

My hobby interests are in building technology (e.g. FOSS hardware & software) and making it easier to use and more accessible.

In the past, I have worked in technical support roles for IT companies in wireless networking, help desk, and hardware repair.

@techrecount hackaday.io/initrd

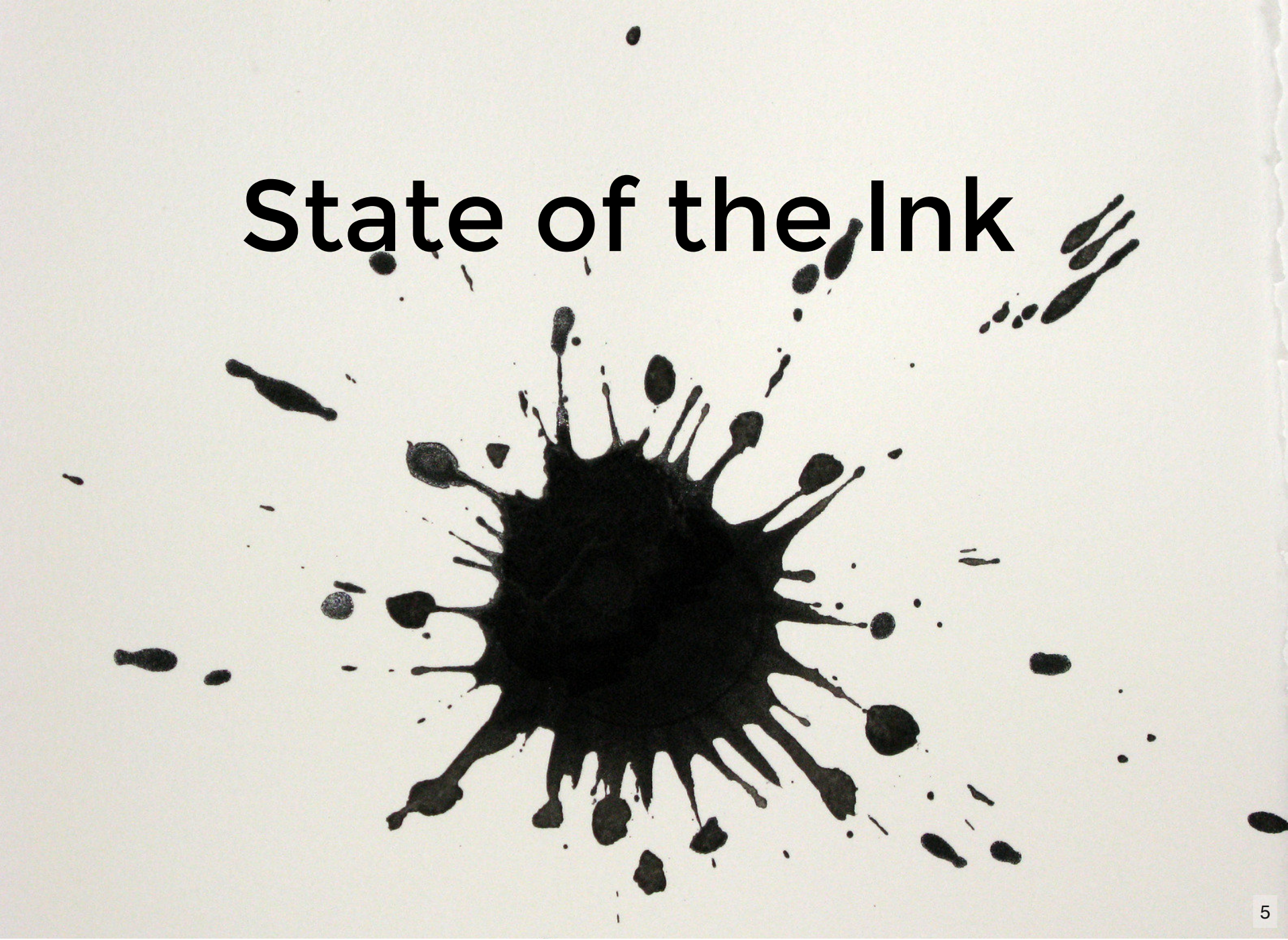
giovanni.lostumbo@gmail.com

Resilient Coders

Our students spend 20 weeks with us, learning object-oriented programming principles, through the vehicle of full stack javascript; that's vanilla JS, React, Express, Node, and PostgreSQL.

HIRE DONATE

State of the Ink



Speaker notes

Overview of e-ink based devices and difficulties faced.

E-ink based tablets, smartphones, e-readers and monitors.

Onyx Boox Max Lumi

Dasung HD-FT

Hisense A7CC

Kaliedo 2 Color e-Ink

Hisense Q5 RLCD

Kindle Paperwhite

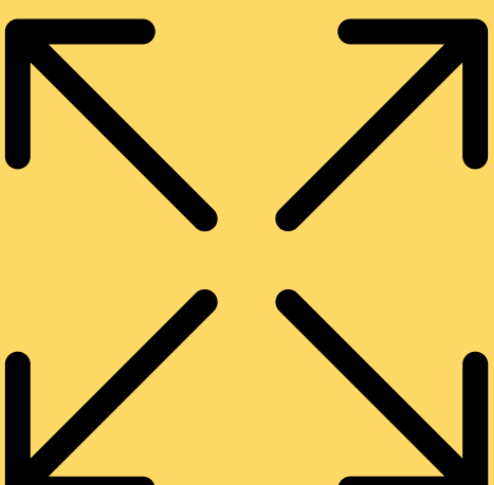
Pocketbook Inkpad Color E-reader

Speaker notes

It's 2021, and there are several e-ink based devices to choose from:
- Onyx Boox Max Lumi
- Dasung HD-FT
- Hisense A7CC 6.7" Kaliedo 2 Color e-Ink
- Hisense Q5 RLCD
- Kindle Paperwhite
- c

And...

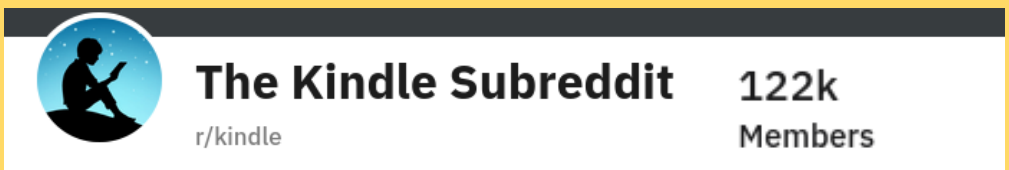
We are segmented...

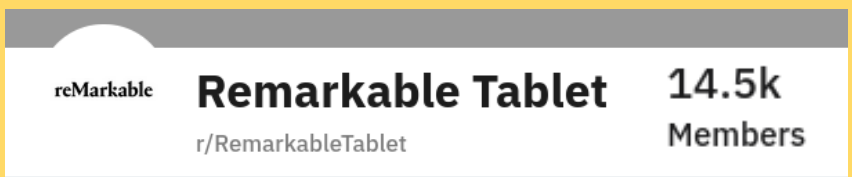


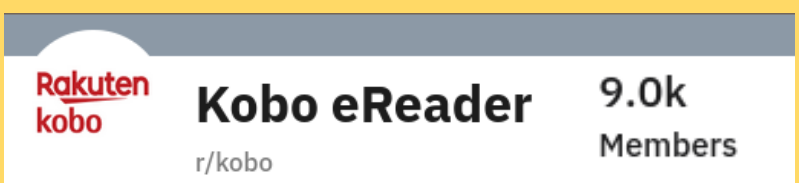
Speaker notes

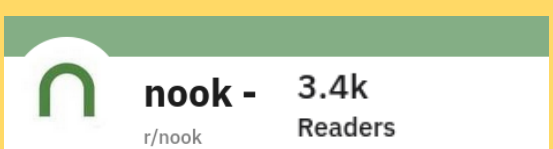
Community sizes

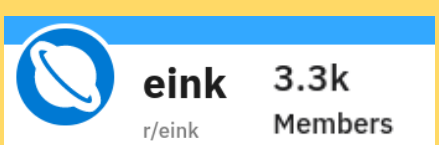
across devices and e-ink projects

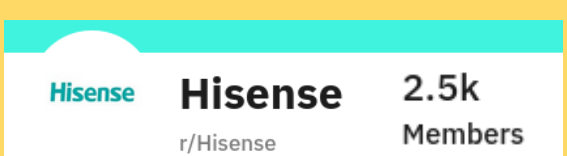








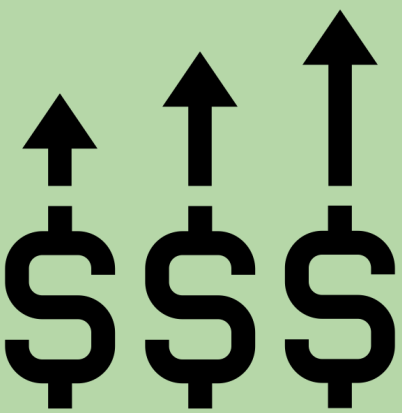




Speaker notes

I'm not passing a value judgment rather making an observation.

This segmentation makes it difficult to unite as a community and push manufacturers for open design, open hardware, and free open-source software.

Cost... 

large panels are expensive

13.3"

$1,199

10.3"

$539

13.3"

$449

42"

$4,000

10.3"

$349

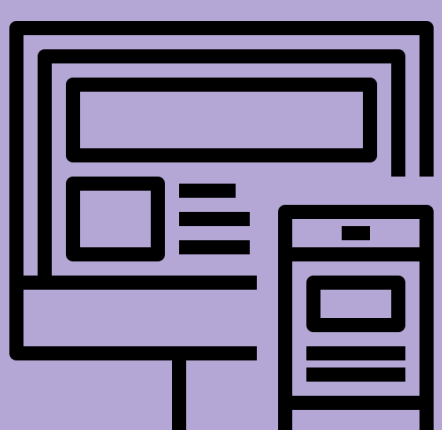
9.7"

$250

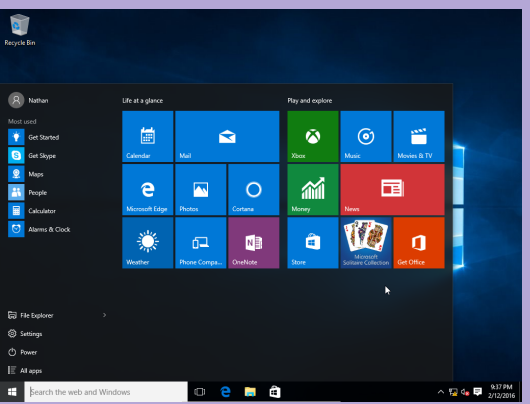
Speaker notes

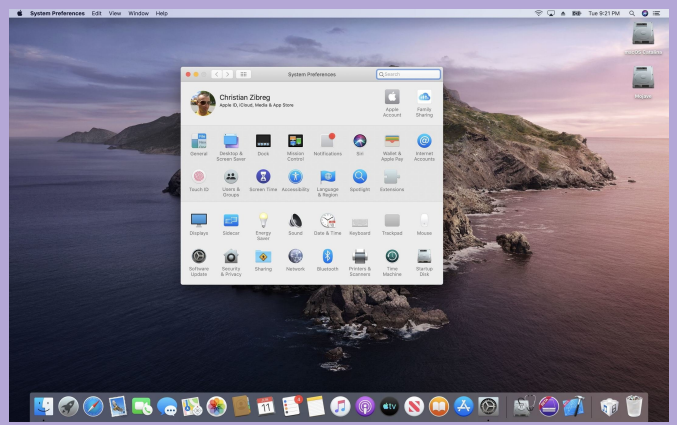
- For makers/tinkerers/DIY to iterate and hack on...
- Manufacturers intentionally hiding information, chemically peeling off components to prevent reverse engineering.

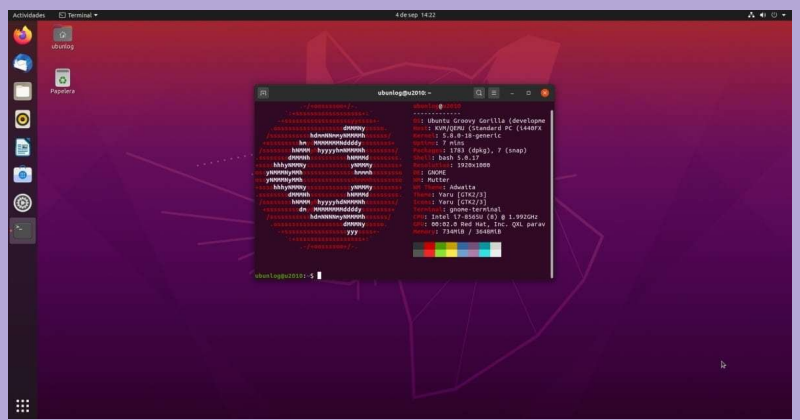
UX and UI for e-ink devices are...



designed for LCD's



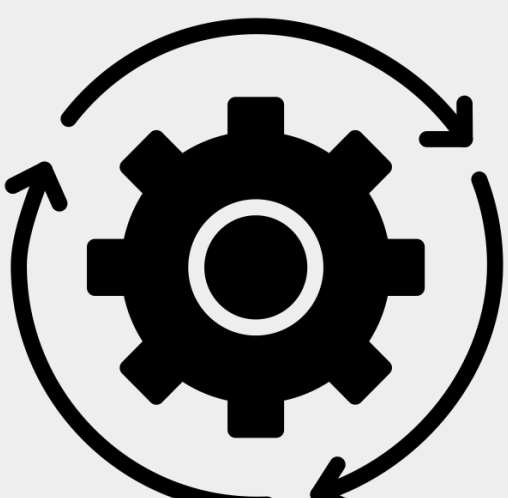




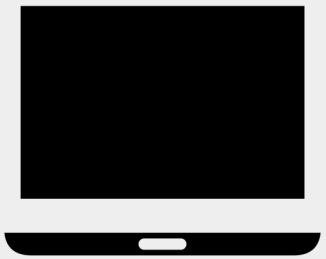
Speaker notes

- There doesn't exist an e-ink first UX/UI
- Interfaces are non-existent
- Proprietary and some violate GPLv3, Onyx
- Android-based devices stop receiving updates and support from manufacturers.

We can build an...



E-ink Laptop



Proposal: el-2030 - The Community Built E-Ink Laptop Project

Projects ■ Project Introduction

develop and produce the display. Something like https://en.wikipedia.org/wiki/Pledge_fund

Let's make it happen.

The talent and knowledge to make an e-ink laptop exists; it's here; we can do it right now if we wanted to.

I agree with all of your points.

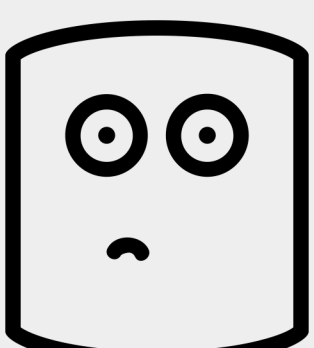
To reach that goal, I think some visibility and publicity would have to occur. I recently made a post titled "Building an E-Ink Laptop 6," where I'm documenting the steps I'm taking to build an e-ink laptop, which generated a lot of interest 2. The past few days, I've had the good fortune and privilege to talk to many people working on amazing projects related to e-ink, and I have learned a lot and have shared my thoughts and discoveries.

One of the barriers to entry when working with e-ink panels of larger sizes is the price. One idea I had around this was creating the: "**el-2030: The Community Built E-Ink Laptop Project**", where community members pool resources and knowledge to build an e-ink laptop.

Speaker notes

- We can open design, open hardware, and use free open-source software.
- The building and creation of this community are more important than any product that may come from it.

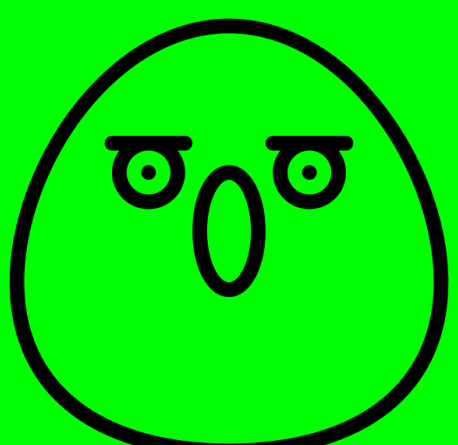
That sounds....



Amazing!

Difficult

Fantastic



Challenging

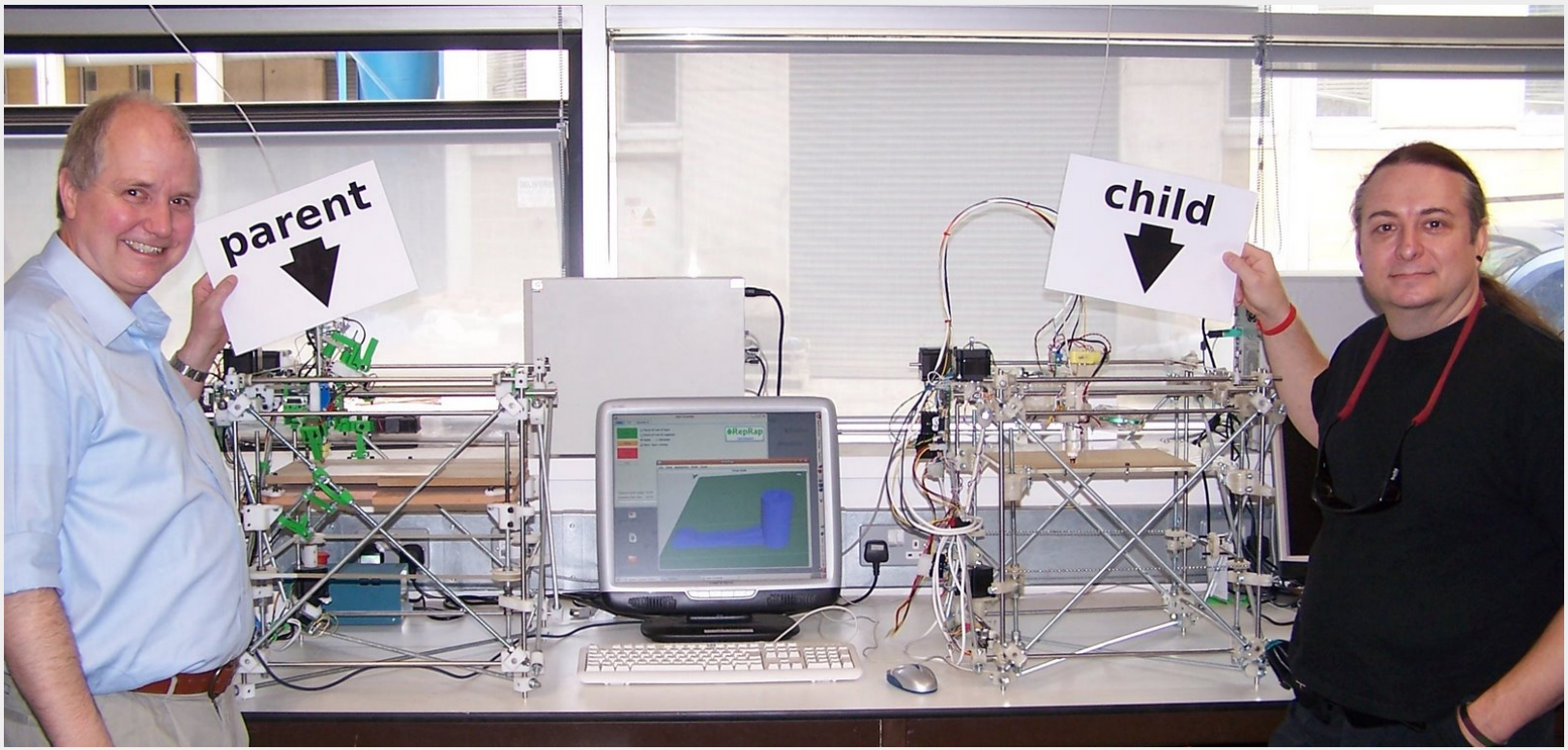
YES!

Impossible

We cannot do this because of X...

if not us, who, if not now, when?

RepRap project

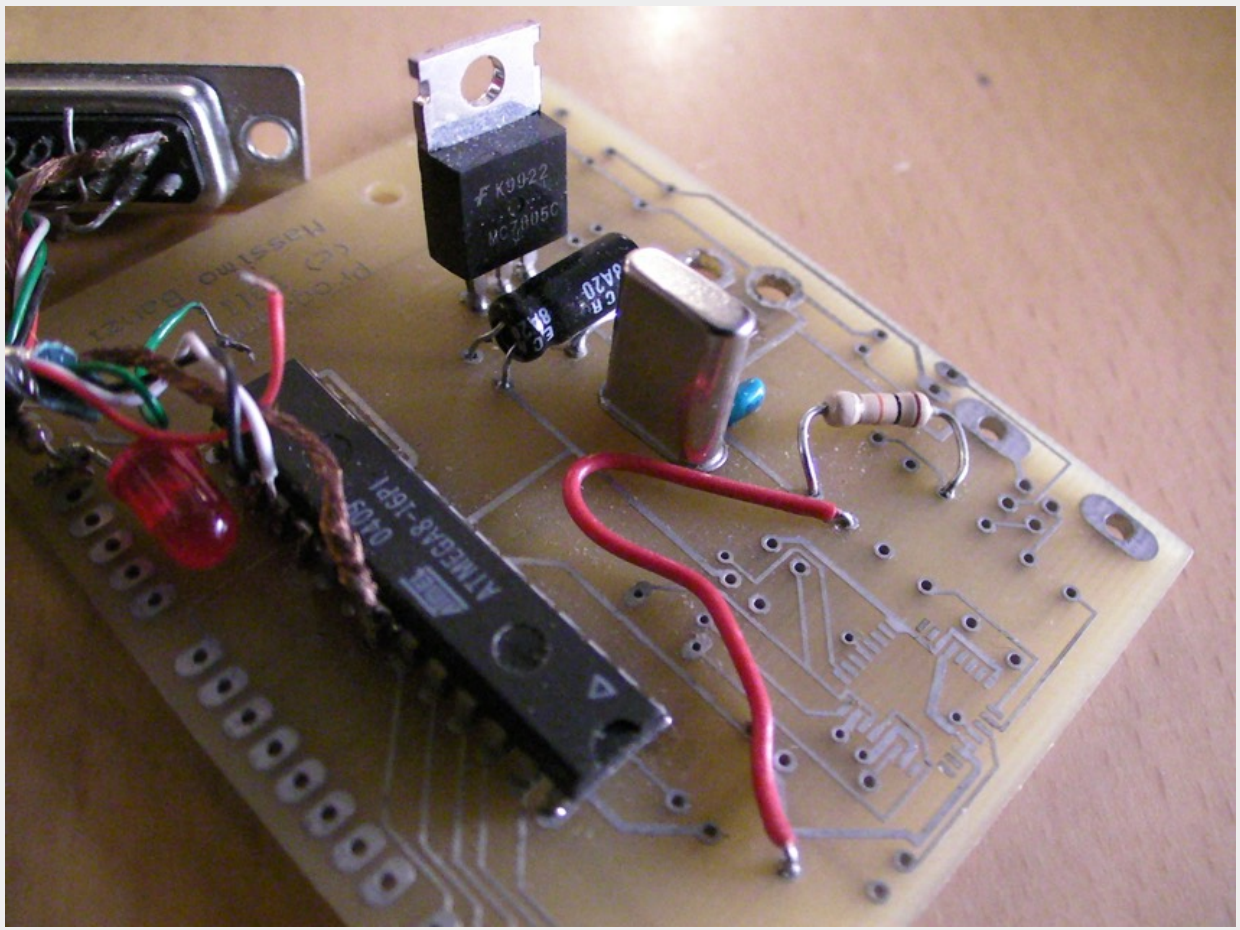


Speaker notes

The RepRap project started in England in 2005 as a University of Bath initiative to develop a low-cost 3D printer that can print most of its own components, but it is now made up of hundreds of collaborators worldwide. RepRap is short for replicating rapid prototype. As an open design, all of the designs produced by the project are released under a free software license, the GNU General Public License.

All of the plastic parts for the machine on the right were produced by the machine on the left. Adrian Bowyer (left) and Vik Olliver (right) are members of the RepRap project.

Arduino



Speaker notes

The Arduino project began in 2005 as a tool for students at the Interaction Design Institute Ivrea in Ivrea, Italy, aiming to provide a low-cost and easy way for novices and professionals to create devices that interact with their environment using sensors and actuators.

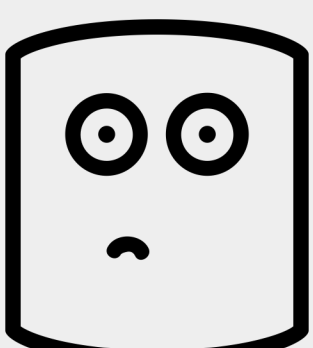
Common examples of such devices intended for beginner hobbyists include simple robots, thermostats and motion detectors.

I'm listening...

Objectives

- To generate interest in the idea of creating an e-ink laptop.
- To unite and increase our numbers.
- To iterate, test ideas, document, and show our work.
- Create a crowdsource campaign after the successful creation of a minimum viable product.
- Bring the MVP to a manufacturer and build at scale.

How?



Working Groups

Speaker notes

- People self-organize into working groups.
- Some categories for the working groups:
- low power, high power, sub $500, $500-800, SBC, microcontrollers, general purpose.

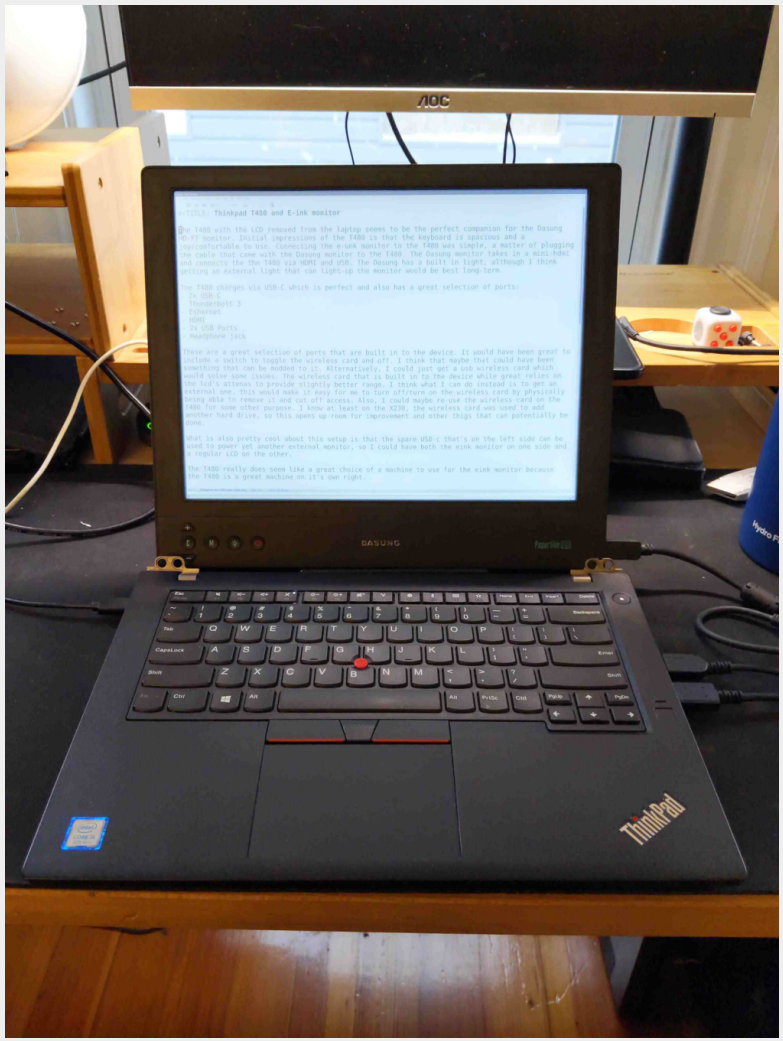
Working Groups

- Led by one or two people as leads.
- Defines a metric/cost for who the device is for.
- Working groups are time-boxed defined.
- A "template" provided for the working groups to start and self-organize.

Working Groups Contd.

- The working group documents its process in a designated website, forum, Github, a build log.
- Share resources/knowledge/material/monetary.
- Generate interest, share our work with others.
- Iterate, iterate and iterate.

Concept #1:
Thinkpad T480 and Dasung HD-Ft



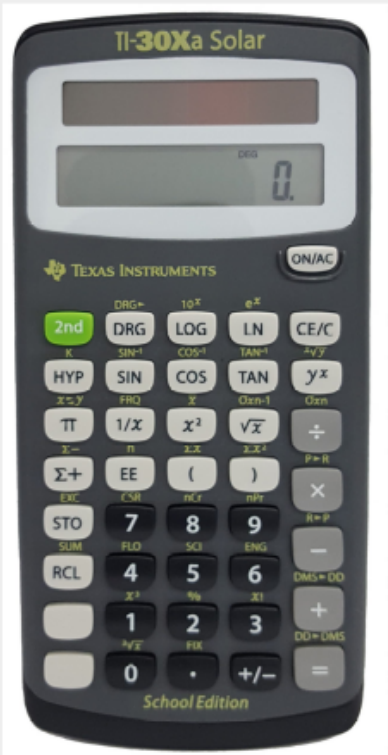
Speaker notes

- Created a blog post
- Received visibility and support on HN, Reddit, and featured in magazines in Germany and Spain.
- Work in progress

Concept #2:
E-ink, low-power CPU, and solar power:
3 Sides of the same lid

- A laptop able to stay online for 12hrs while being re-charged daily in ambient conditions- e.g near a window or a few ceiling lights.
- Doesn’t depend or emphasize staying online, but is capable of doing so (Encourages work/life balance)
- Uses E-ink or Low Power Display such as Memory-In-Pixel (MIPS)
- Converging High Tech & Low Tech (It sounds high tech today, but commonplace tomorrow)
- What would this look like?

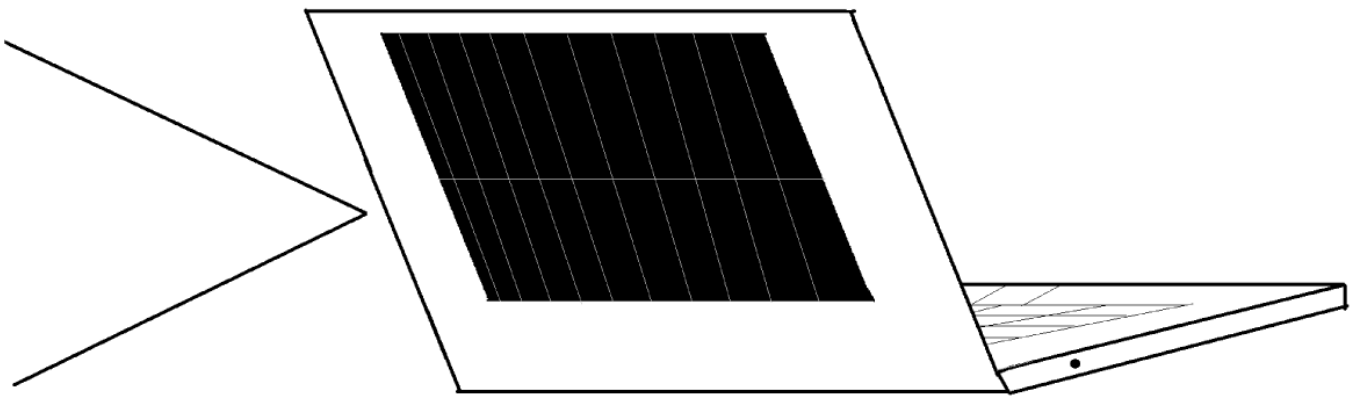
Ti-30Xa Solar (Self-Powered) +



Pomera DM30 Digital Memo+

What would this look like?

Old concept + New technology= An innovation



Existing Solar Powered Product (TI30Xa Solar-Old Tech)+ =Solar Powered Digital Typewriter
New Low Power GUI-based Typewriter (Pomera-New tech) =& Minimum goal of next gen tech

How could we get there?

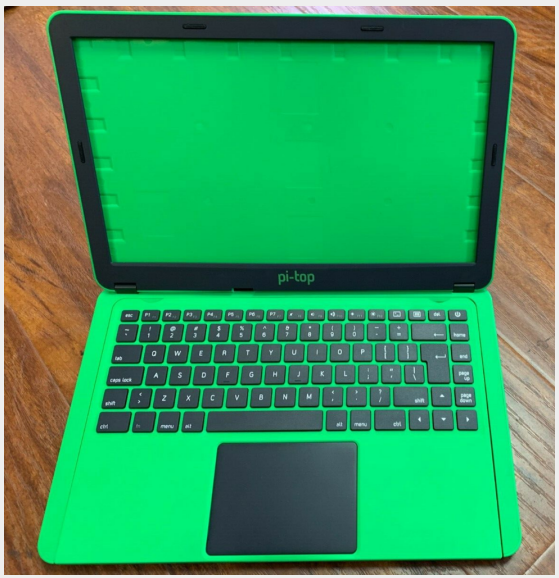
- Microcontrollers (MCUs) (e.g. Espressif ESP32 WROVER w/8MB RAM)
- Human Machine Interface (HMI) Products that utilize ESP32 MCUs include M5Stack, M5Paper , Inkplate 6 & 10” ($200k+ Crowdsupply funded)
- Ambiq Micro Apollo3/4 MCUS are in IoT & Wearables such as in watches & sensorsthat use ultra-low power- 6uA/mhz-
- RTOS & Linux Development- Genode microkernel (sel4-based) -compact Linux in a MCU

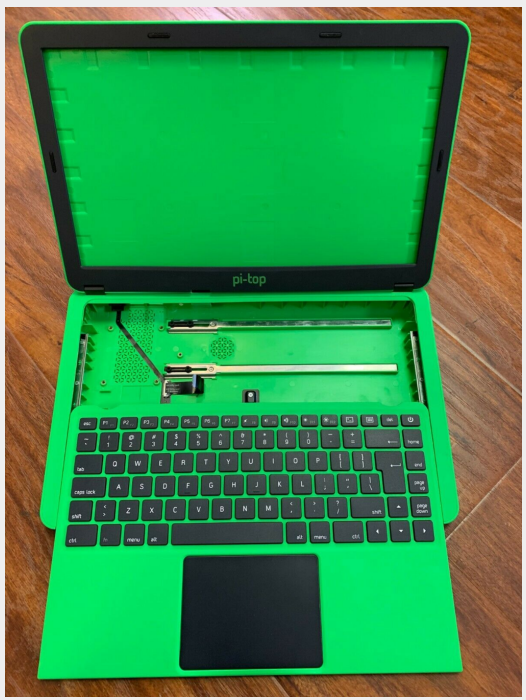
- Why develop Linux on MCU?

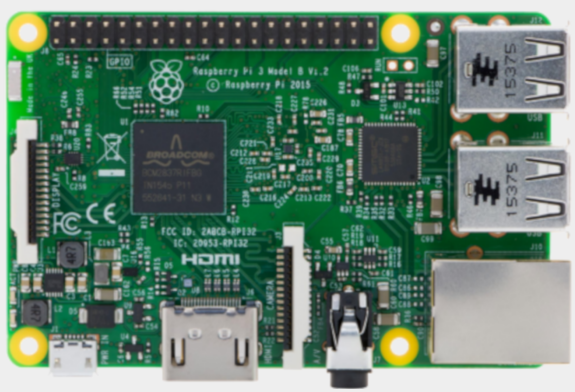
- Setting limits on power consumption makes it easier to achieve solar goal
- Cheaper

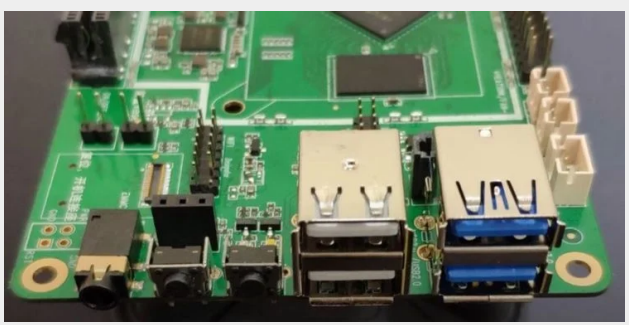
Concept #3:

Pi-top and E-ink Panel









Speaker notes

- Using a pi-top, a laptop chasis intended for a raspberry pi and retrofit it with a Dasung panel or possibly a waveshare.
- V1 of the pi-top released as open source.
- in the future could be used with other SBC's and Pine64

What have we done so far...

Pi-Top

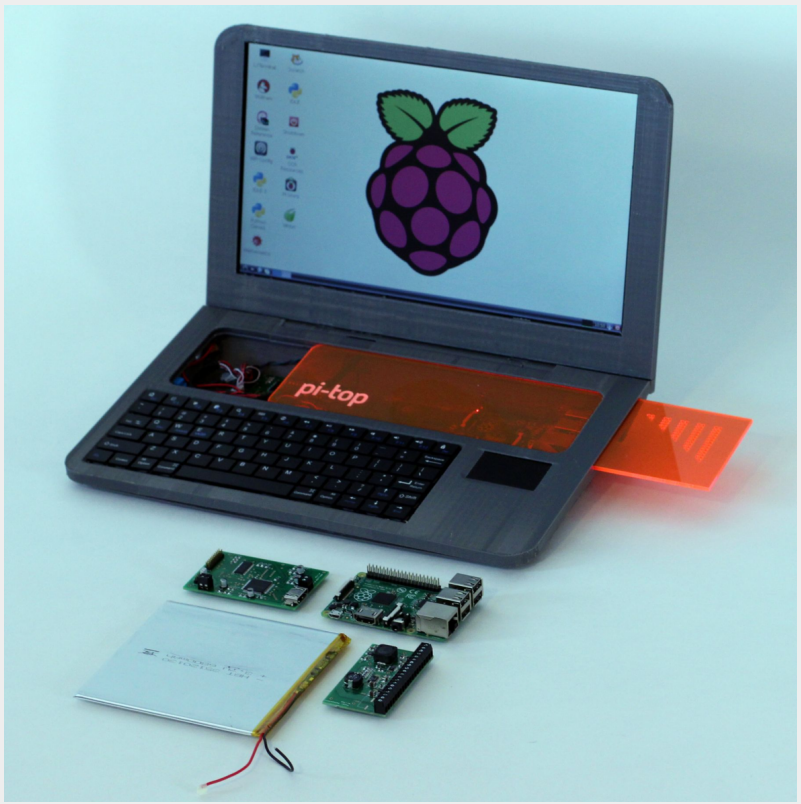
pi-top

PRODUCTS SOFTWARE EDUCATION BLOG SUPPORT

MEET PI-TOP [3].

pi-top [3], the Makers' Laptop, is a great introduction into physical computing. Learning moves from being just screen-based to being hands-on, so you're learning by making. It's the perfect tool to help you learn to code, create awesome devices and systems, and take your knowledge to the next level.

Buy pi-top [3]



Speaker notes

Sent an email to pi-top about collaborating/gaining access to CAD files for their pi-top v1/v3

VIA OpenBook

README.md

via-openbook

This is modified version, scaled to 15 inch from a mirror of the Creative Commons licensed VIA OpenBook CAD models, taken from http://brlcad.org/~starseeker/CAD_MODELS/VIA_OpenBook/ on 2015-05-04.

The VIA OpenBook was a "laptop reference design", with an open source case, released in 2008 and subsequently discontinued. More information is available on Wikipedia.

Speaker notes

Researched and learned about the VIA OpenBook a laptop reference design from VIA Technologies, announced in 2008. The laptop case design was released as open source, and was modifed to work for 15inches.

Slimbook

SAT
19
OCT
2019

Slimbook collaborates with the PowerPC laptop

We are pleased to announce our collaboration with Power Progress Community (PPC), the association behind the creation of a PowerPC processor laptop, in this case the NXP T2080. The PowerPC instruction set has been recently released by IBM as open source and given to the Linux Foundation.

The PPC project aims to create and promote open source hardware and software. The project was born in Italy in 2016.

In the software part, PPC adapts and compiles a well known version of GNU / Linuxl, Debian. You can find some applications in its repository.

In the hardware part, its efforts are focused on collaborating with Acube Systems to manufacture the motherboard, which will be powered by the aforementioned processor.

Slimbook joined the project at the beginning of 2019, providing the entire body of the laptop. The body of the laptop is actually the entire case, the cooling system, the screen, the keyboard, the backlight, the webcam, the speakers and the battery.

After several months of work, sharing with them electronic schemes of all the components we contribute, it's time to be prepared to manufacture the motherboard and that is why the PPC association has initiated the fundraising campaign. (Do not hesitate to make your contribution to the project)

Externally, the design of the computer is our Eclipse model, because having its large cabin, adapts to the needs of the notebook, which among other features will have MXM removable graphics card.

Below you can see a picture of it and then the electronic schematics.

Speaker notes

Reached out to Slimbook. A manafacturer in Spain provided the entire body of the laptop: the entire case, the cooling system, the screen, the keyboard, the backlight, the webcam, the speakers and the battery.

https://slimbook.es/en/noticias-notas-de-prensa-y-reviews/435-slimbook-collaborates-with-the-powerpc-laptop

Open Book Project

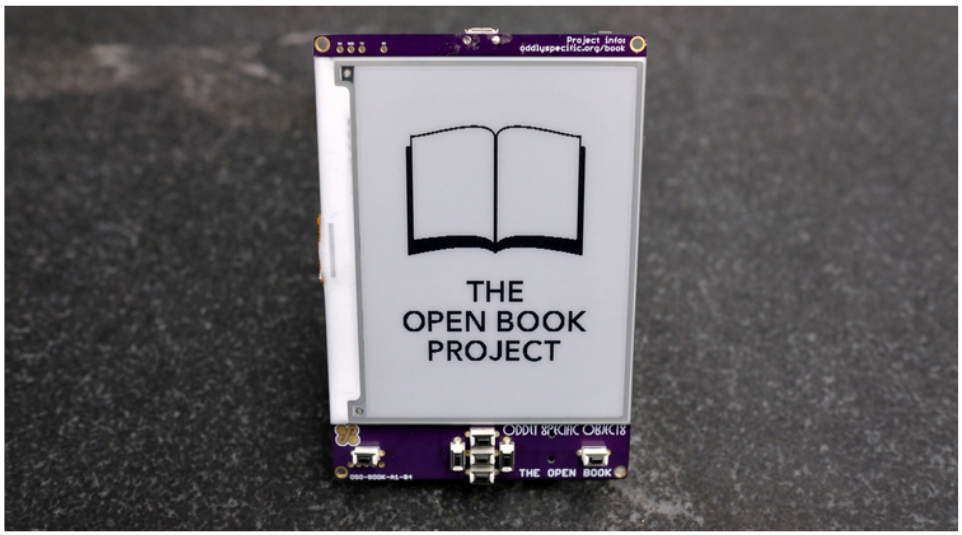
The Open Book Project

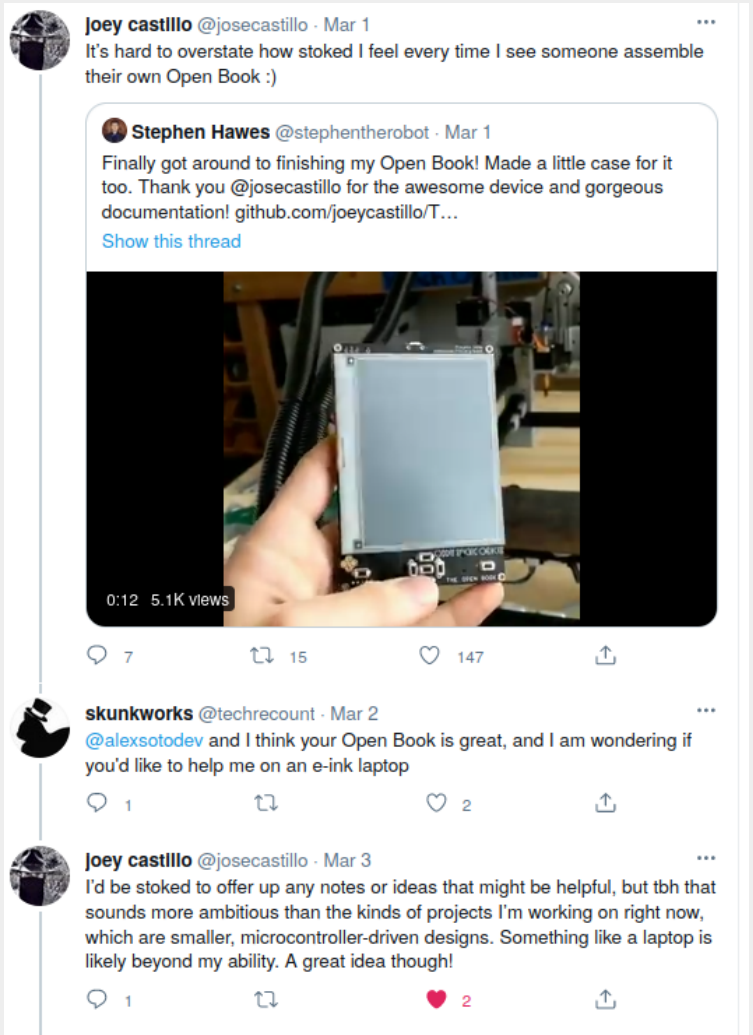
Quick Links

- Purchase the E-Book FeatherWing PCB on Tindie
- Purchase the Open Book PCB on Tindie
- Setup guide for the E-Book Wing (and Assembly Video)
- Setup guide and documentation for the Open Book
- Project page on Hackaday.io
- Mailing list signup; I haven't sent anything yet, but when I have something big to share, you'll get it there.

With that out of the way, on with the readme!

As a society, we need an open source device for reading. Books are among the most important documents of our culture, yet the most popular and widespread devices we have for reading — the Kobo, the Nook, the Kindle and even the iPad — are closed devices, operating as small moving parts in a set of giant closed platforms whose owners' interests are not always aligned with readers'.





Speaker notes

Reached out to the open book project creator, Joey for support. Agreed to help by providing suggestions/input.

Next Steps ↘️↗️↘️

- Continue spreading the word and bringing more folks on board.
- Further defining and bringing clarity to the project.
- Ramp-up state: setting up tools, forum, templates
- Writing an article that summarizes the information shared here and share
- Building community, building relationships, building openly

alexsoto.dev/slides

Thank you!