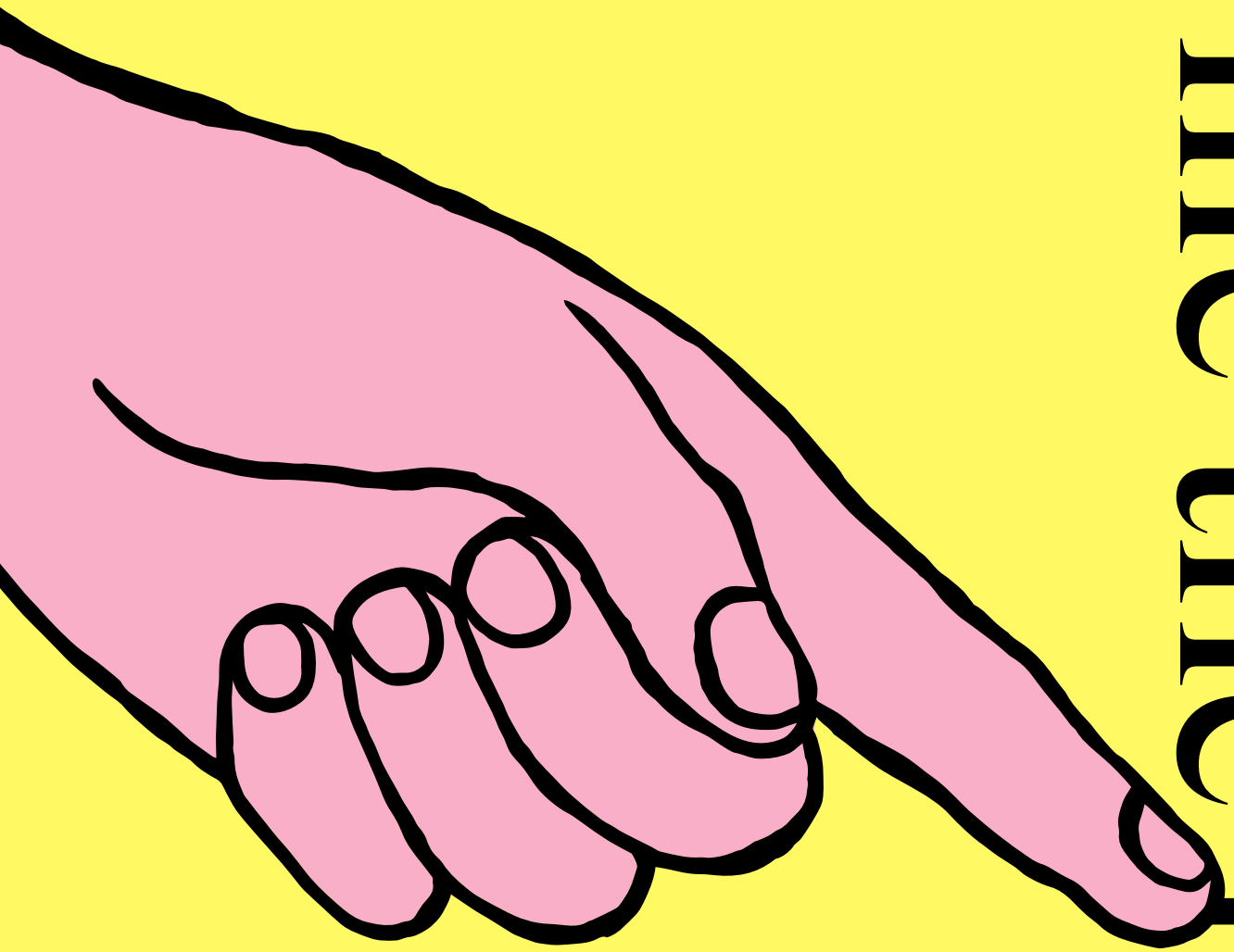
Show me the money



V 1.0

Revenue model catalogue
for open source hardware

Creating *open* businesses

This is a collection of case companies that have made profitable open source hardware products, including a blank case-template sheet for readers to be inspired and experiment with open business development.

The point is that other companies can learn directly from the cases, be inspired and get a better grasp of how they themselves can make open source hardware good business in their context.

Each case shows the company's customer groups over a timeline of three phases, including:

- Early innovators, early adopters and mainstream customers
- The key offering to each customer group
- The reason why these customers buy the product.

We then use color codes to show which revenue streams aka. Strategic Approaches, the company is mixing together to gain commercial success.

It is impossible to present all nuances of the intricacies of how an organization works in this short format. Readers should be aware that some complexity and nuance may have been left out to ease comprehension.

We hope that these open companies will inspire others to collaborate with the global creative community and reinvent how we create products and services.

Open regards,

The Open Next team
@ DDC - Danish Design Center

Strategic approaches model

As discovered through OPENNEXT's research, Open Source Hardware companies tend to combine six complementary strategic approaches to create a viable business model based on community growth.

Leverage through communities
Gain momentum from early customer groups, and later you will potentially have a natural way to address more mainstream customer groups.

Platforming
Allowing suppliers of goods and services to connect directly with customers in order to cut out middlemen and learn about their needs directly from the source. Moreover, the control and influence you gain from owning the platform often surmount being the entity that actually supplies the goods.

Crowd- & third party funding
From conventional efforts to attract angel investors and to go through seed rounds as defined by common norms to public funding such as grants and innovation support as well as private donations and crowd-funding, where customers and community alike pay upfront.

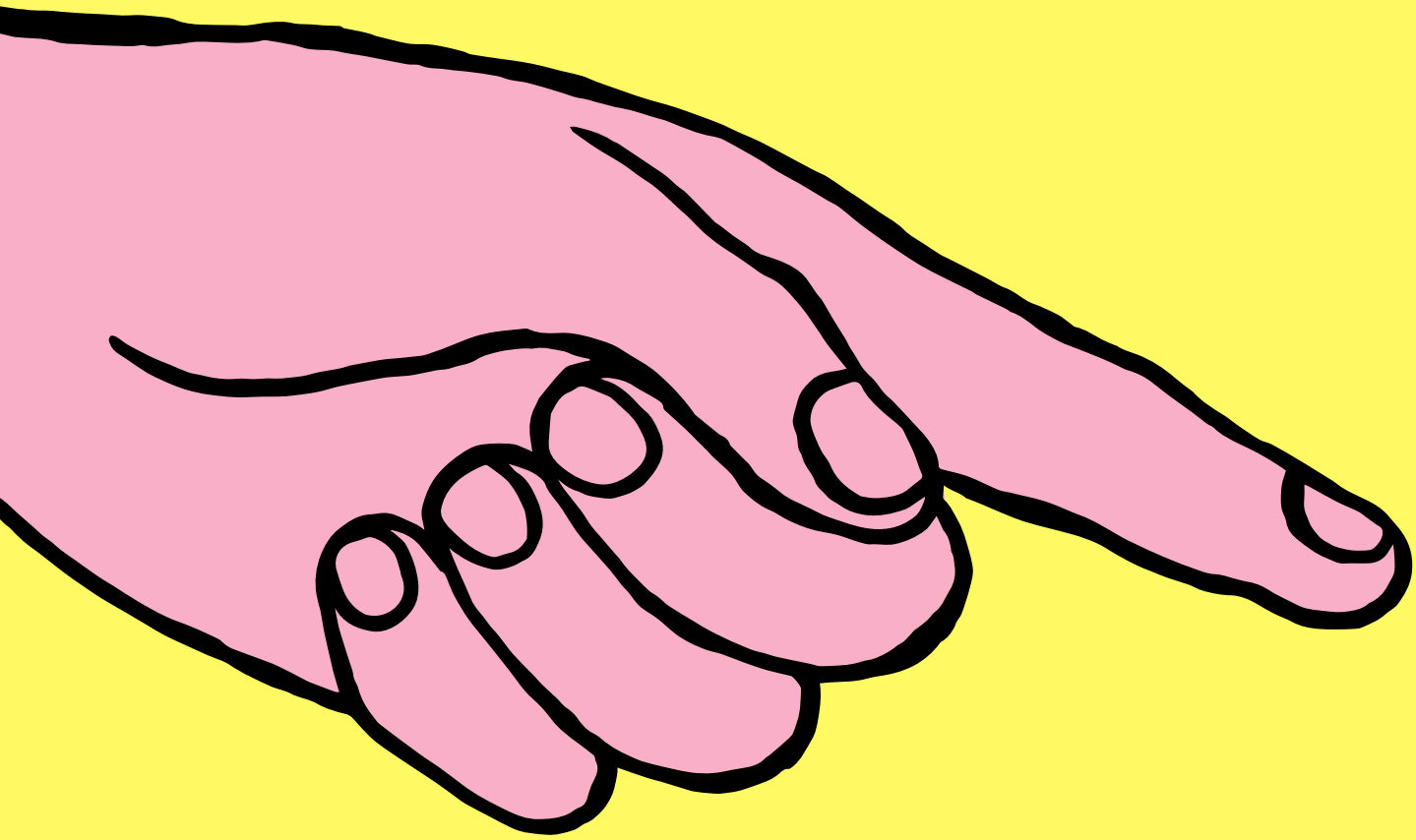
Ecosystem infrastructure
Digging one or several layers deeper than Platforming, Ecosystem infrastructure focuses on providing key enabling services or resources for customers in a relevant ecosystem or professional industry.

Selling hardware
Make a product that someone needs, and fulfill that need in exchange for money through sales either online or through retail.

Consulting services
Including; facilitating/hosting workshops, offering technical consulting either ad-hoc or on a subscription/retainer basis, co-development with customers, and, lastly, offering full enterprise solutions.

Case companies

Which companies have succeeded with Open Source Hardware?



Arduino

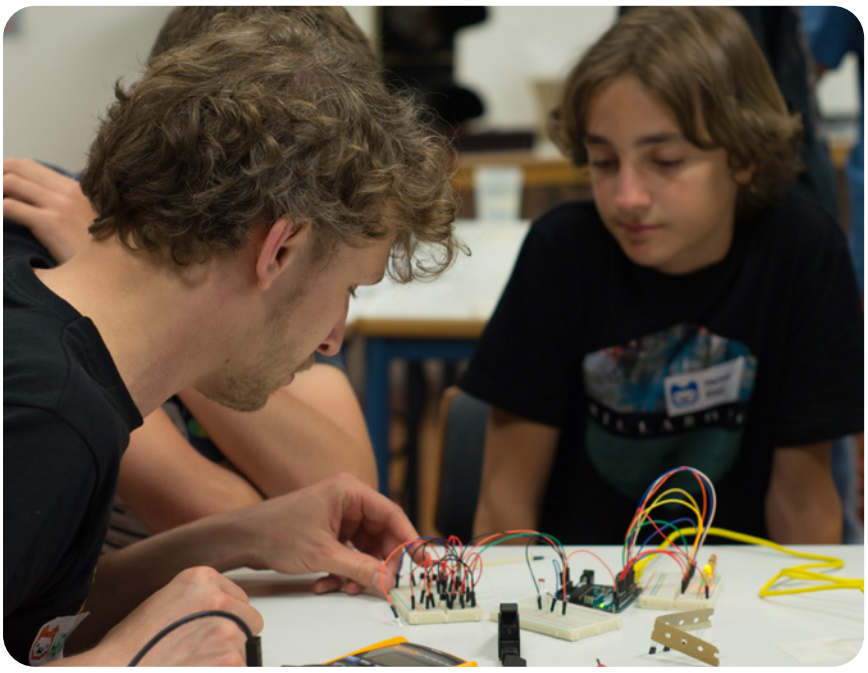
We certainly don't regret choosing an open source business model, as that is what allowed us to stand out and get ourselves established

Massimo Banzi, Arduino, 2015

Open, simplified electronic prototyping
Arduino created a unique, low-cost and open source series of hardware microprocessors, that allow non-technical users to build basic electronic circuits using an intuitive software suite.

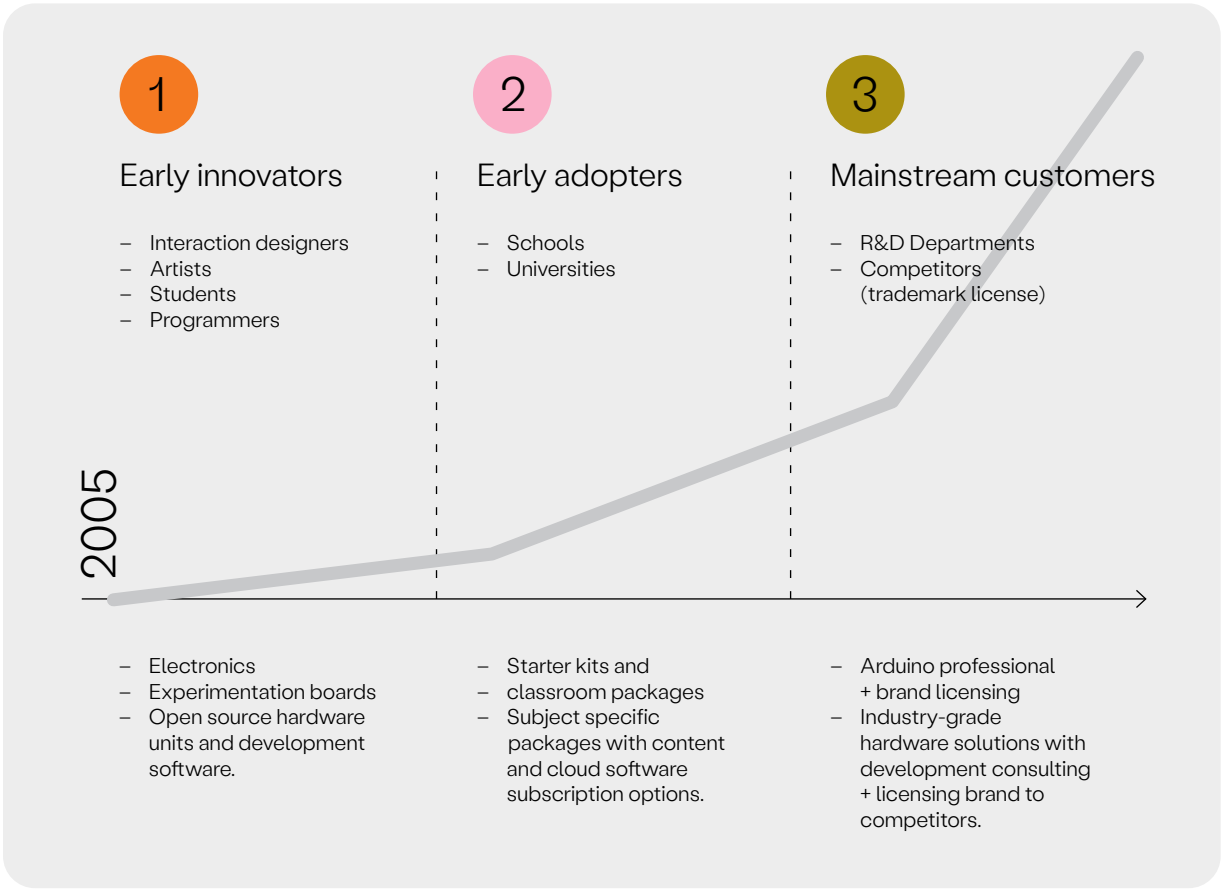
Deep customer participation
Arduino develops, manufactures and distributes the hardware together with full schematics and documentation to the public. This has allowed a large, global community to emerge around their products and added massive value for future users via user-generated libraries of useful code and guides etc.

Protecting trademark matters
Use of the Arduino brand name, led to inner conflicts when the product became successful and threatened the company. It could have been avoided by registering a trademark from the beginning.



An educator teaching Arduino to a student.
Open Knowledge Foundation Deutschland from Deutschland,
CC BY 2.0, via Wikimedia Commons

How have their offerings evolved over time?

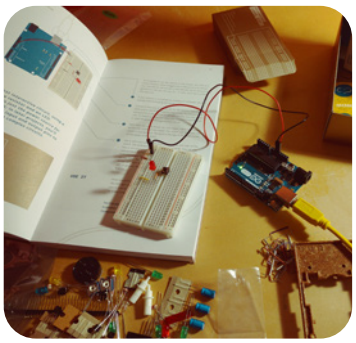


1

Early innovators

Standalone Arduino Uno board, Pete Prodoehl, CC BY 2.0, via Wikimedia Commons

2



Early adopters

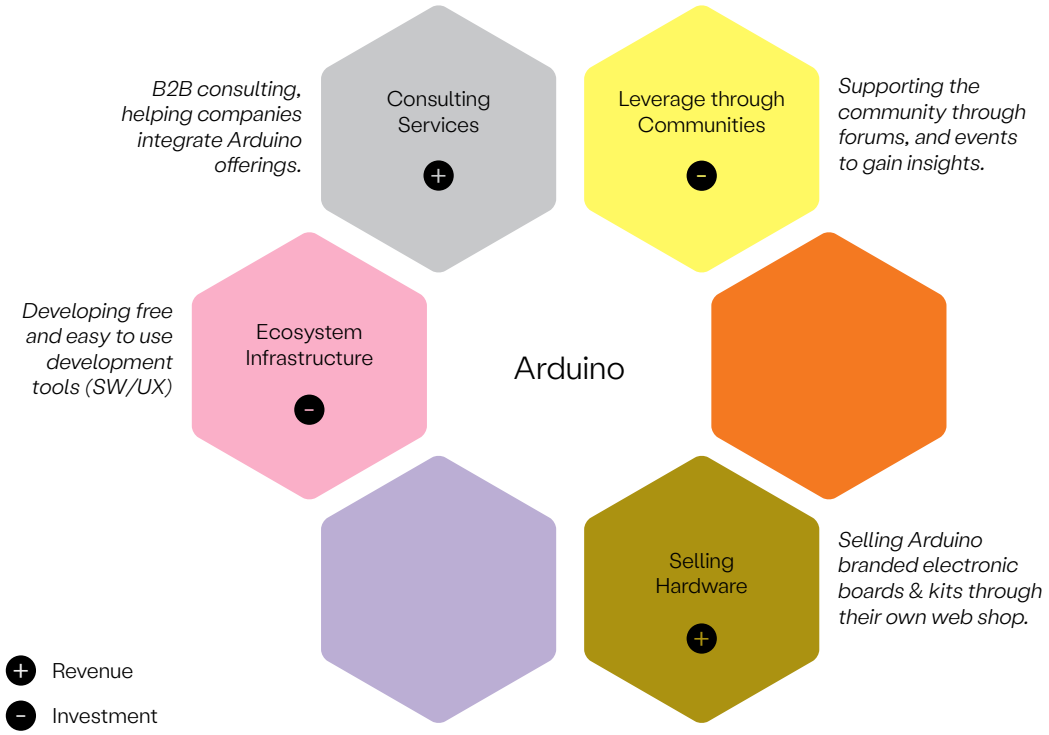
Starter kit being used, Photo by Spencer on Unsplash

3

Mainstream customers

SAS using Arduino based security system,Masakatsu Ukon, CC BY-SA 2.0, via Wikimedia Commons

What are their Strategic Approaches?



What motivates the customer?

1 Early Innovators

- User-driven support + use cases
- Affordable + easy to use
- Extensive documentation and guides

2 Early adopters

- Emerging as a standard among learners
- Convenient all-in-one offering
- Vast project library + improved cloud based software

3 Mainstream Customers

- Existing code libraries ready to use
- Trusted standard
- Leading open solution provider

Precious plastic

We share all information; code, drawings and source material. Online, for free.

Dave Hakkens, Precious Plastic founder, 2017

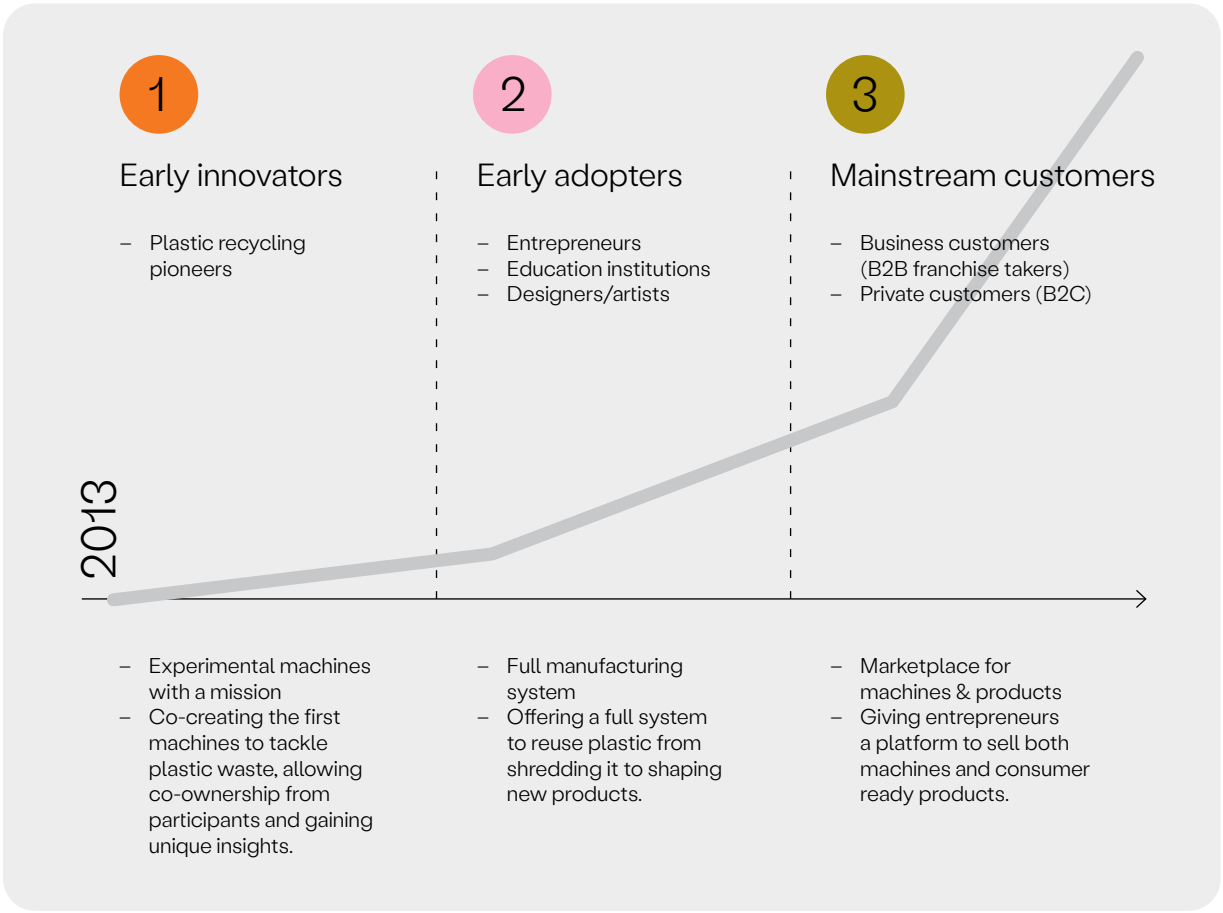
A manufacturing ecosystem for recycled plastic
Precious Plastic is an open hardware plastic recycling project: It relies on a series of machines and tools which grind, melt, and inject recycled plastic, allowing for the creation of new products (and new local businesses) out of recycled plastic on a small scale.

Mission to use plastic waste as a resource
They design and develop machines to recycle plastic. For every product they tell the world how to replicate them, for free. They do this to come closer to a solution to the plastic waste problem. Precious Plastic is itself a company, and helps others to build recycling businesses.

Using open source for global impact
Many new companies have independently emerged based on Precious Plastics' technology,concept and all-in-one guide to start a plastic recycling company. There is now a global network of businesses working together, like Precious Plastic Fiji, Plastplan (Iceland) and Precious Plastic Bangkok (Thailand) to name a few.

Woman removing recycled plastic from a mold. Precious Plastic. CC BY-SA 4.0

How have their offerings evolved over time?



1

Early Innovators

Plastic shredder prototype.
Precious Plastic, CC BY-SA 4.0

2

Early adopters

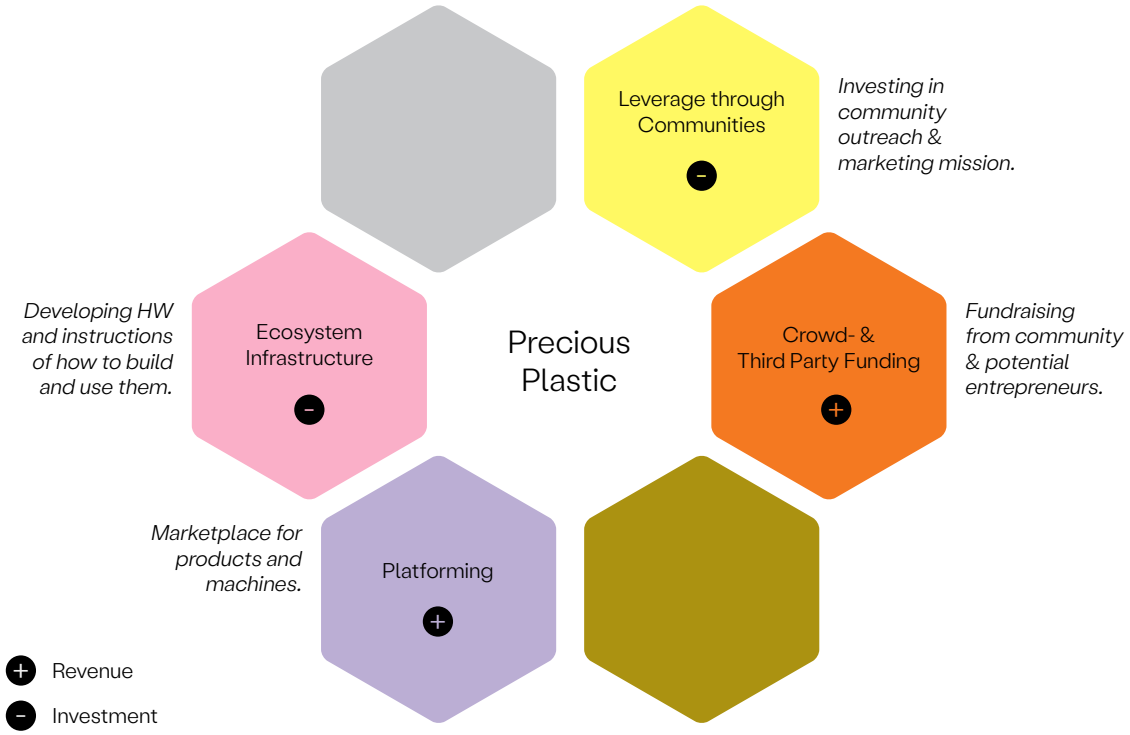
Plastic production machines.
Precious Plastic, CC BY-SA 4.0

3

Mainstream Customers

Earrings sold at the Bazaar (Marketplace)
Precious Plastic, CC BY-SA 4.0

What are their Strategic Approaches?



What motivates the customer?

1 Early innovators

- Strong sustainability action agenda
- Cheaply available manufacturing system
- Giving opportunity for co-ownership and contributing to the cause

2 Early adopters

- First-movers gain access to plastic recycling experts
- More machine variants available through suppliers
- Possibility for minor-scale business to sell recycled plastic

3 Mainstream customers

- A local presence in a global community to create an environmental impact
- Molds and specialized machines available
- Marketplace for machines (B2B) and products (B2C)

XYZ Cargo

Empowering your local community to build or buy the bike they love and need, is not just sustainable and socially just, it is also a good self-sustainable business. Open source is a key component in our exploration of that.

Till Wolfer, co-founder XYZ Cargo, 2021

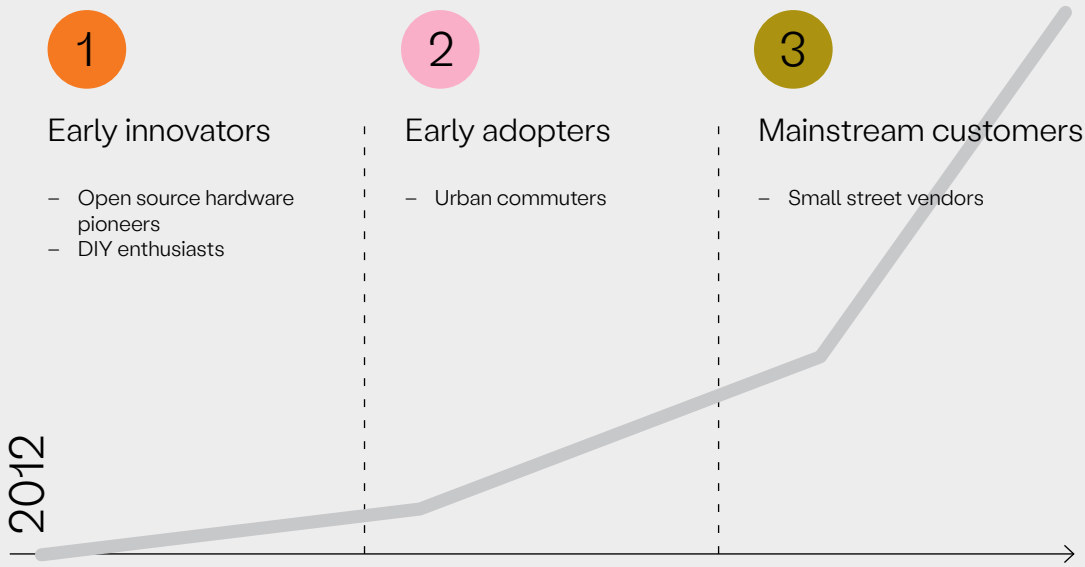
Cargo bikes for all needs
XYZ CARGOs use a completely new way of building functional cycles with a focus on local production in a socially just and environmentally sustainable way. They are based on an Open Source construction system called XYZ SPACEFRAME VEHICLES (CC BY-SA-NC 3.0).

Modular construction
XYZ CARGOs combine bolted, modular and simple rectangular construction methods with the use of advanced 3d design tools. XYZ CARGOs are easy to customize and to rebuild. It encourages DIY ingenuity and participation instead of rigid predefined solutions.

A physical Shareware approach
Operating under a non-commercial license which requires anyone that wants to resell copies to contact XYZ CARGO and get a sub-producer agreement. XYZ CARGO and other contributing designers receive a fair license fee from every sold bike, which affords them to offer free plans for the ONESEATER, CARGO ADD-ONS and other OSH products N55 & Till Wolfer keep developing.

XYZ CARGO by N55 & Till Wolfer
XYZ Cargo, CC BY-SA 4.0

How have their offerings evolved over time?



1

Early innovators

XYZ Cargo Oneseater.
XYZ Cargo, CC BY-SA 4.0

2

Early adopters

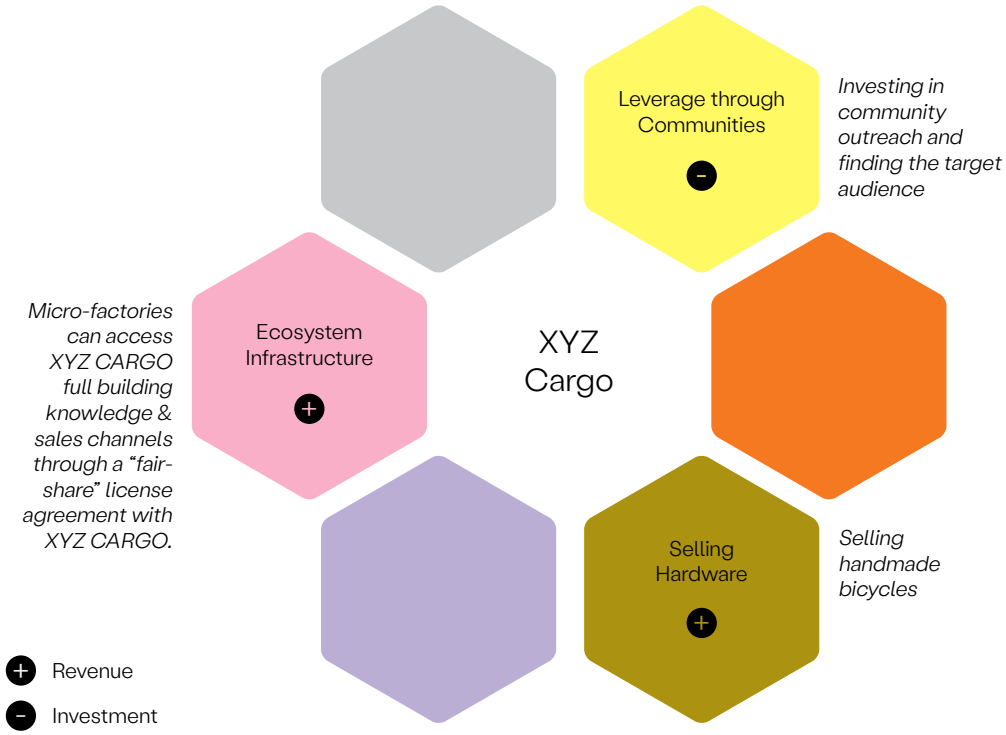
XYZ Cargo Fourwheeler with box. XYZ Cargo, CC BY-SA 4.0

3

Mainstream customers

Pizza bike made in OPENNEXT project.
XYZ Cargo, CC BY-SA 4.0

What are their Strategic Approaches?



What motivates the customer?

1 Early innovators

Becoming a first mover in a community of bicycle innovators.

Professional design and assembly guidance.

Design and assembly guide (BOM) freely available. (only XYZ CARGO ONESEATER)

2 Early adopters

Purchasing a bicycle that is made for their purpose.

Assortment of standard bikes easily customizable.

Trust via Local manufacturing sites in Copenhagen and Hamburg.

3 Mainstream customers

Uniquely flexible and easily customizable to any street vendor's purpose

Co-development support from XYZ Cargo themselves and the community

Extended local trust with manufacturing locations in Paris and Barcelona. Convenient, intuitive online configurator for easy customization

Prusa Research

We never had resellers so we were always in direct contact with the customers in the community and this proved very important for us because you have instant feedback from the people.

Josef Průša, founder Prusa Research, 2021

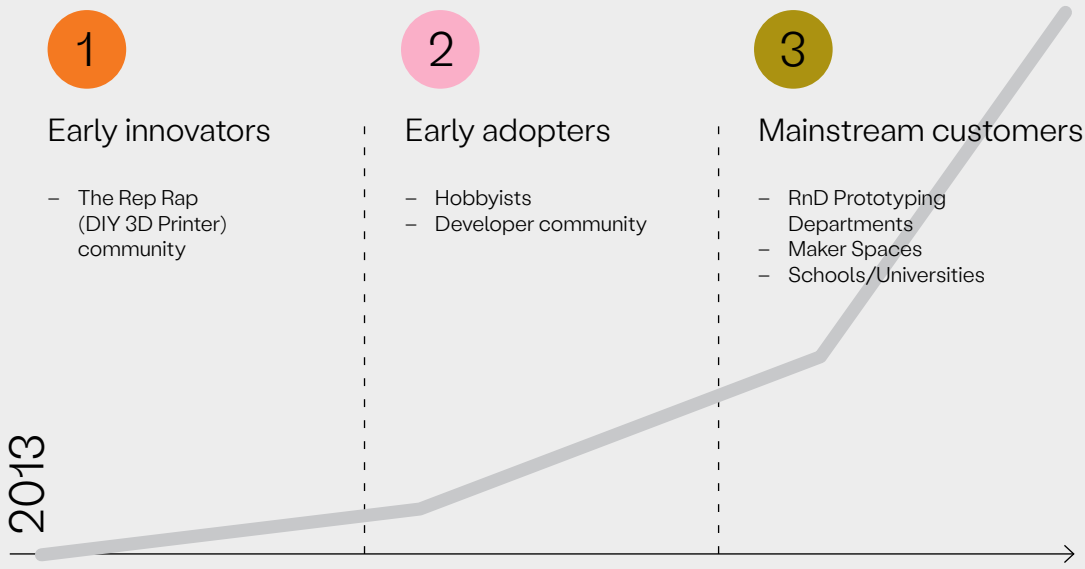
The most used 3D-printer in the world
The Prusa i3 series consists of open-source fused deposition modeling 3D printers, manufactured by Czech company Prusa Research under the trademarked name Original Prusa i3. A derivative of the infamous RepRap project, Prusa i3 printers were named the most used 3D printer in the world.

Developed and built all over the world
Since the i3 series is open source, there have been many variants produced by companies and individuals worldwide.

From humble beginnings to large-scale manufacturing
Prusa Research maintains a ”print farm” of 585 3D printers (as of January 2021) to manufacture plastic parts for Original Prusa branded products.

Josef Průša in Prusa Research offices inside MK2 printfarm
Josef Prusa, GFDL 1.2., via Wikimedia Commons

How have their offerings evolved over time?



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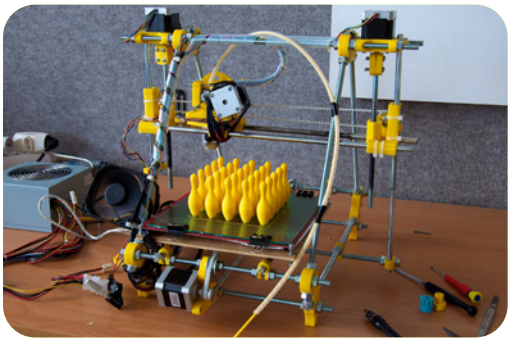

Early innovators

Fully assembled Prusa Mendel (iteration 2).
Marek Žehra, CC BY-SA 3.0, via Wikimedia Commons

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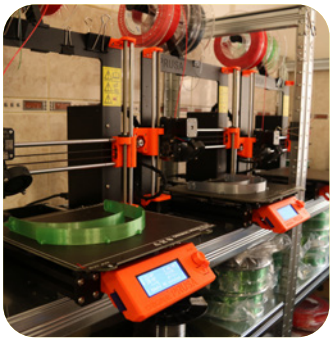


Early adopters

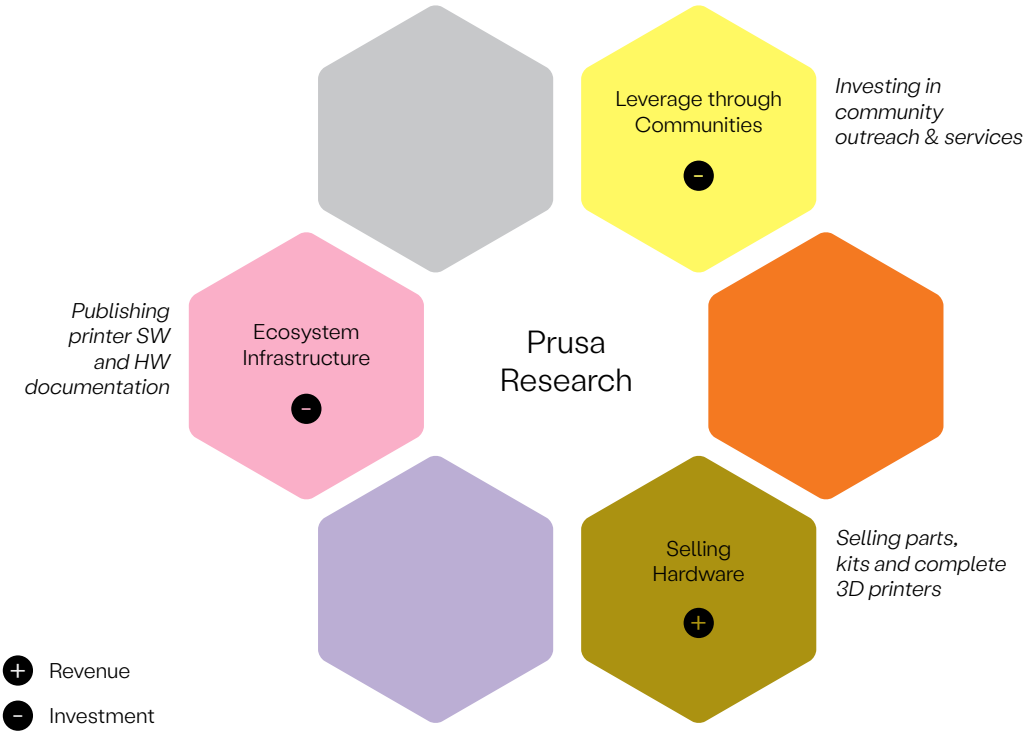
Prusa i3 printing face shields in Kadaň.
Jan Beránek, CC BY-SA 3.0, via Wikimedia Commons

3

Mainstream customers

Detail of print from a Prusa SL1S 3D printer.
©Prusa Research, prusa3D.com

What are their Strategic Approaches?



What motivates the customer?

1 Early Innovators

- Prusa credibility through community participation and design validated by several hobbyists
- Parts to make your own printer.
- Open designs to halve the print time for DIY RepRap printers, freely available

2 Early adopters

- Extensive community for support and help with print quality.
- Great attention to quality in their assembly kits available for purchase.

3 Mainstream customers

- Further interaction with the wider 3D printing community through Prusa funded MakerSpace and events.
- Complete filament and resin printers that offer best in class prints.
- Platform to share and download 3D models and assembly instructions

SparkFun Electronics

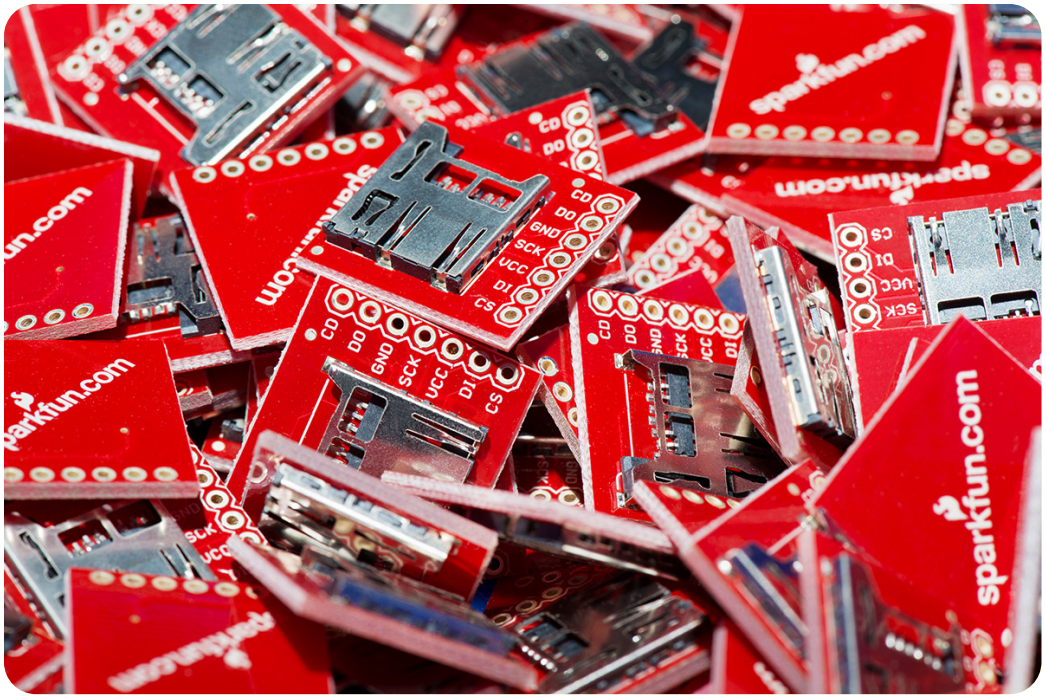
Pick one thing and nail it. SparkFun doesn't do consulting or contract manufacturing; we just design and manufacture cool products for people who are excited about building electronics projects.

Nathan Seidle, Founder SparkFun Electronics, 2018

Electronics for building community
SparkFun Electronics is an electronics retailer that manufactures and sells micro-controller development boards and breakout boards based on a set of values that embrace community building through transparency, accountability and mutual respect.

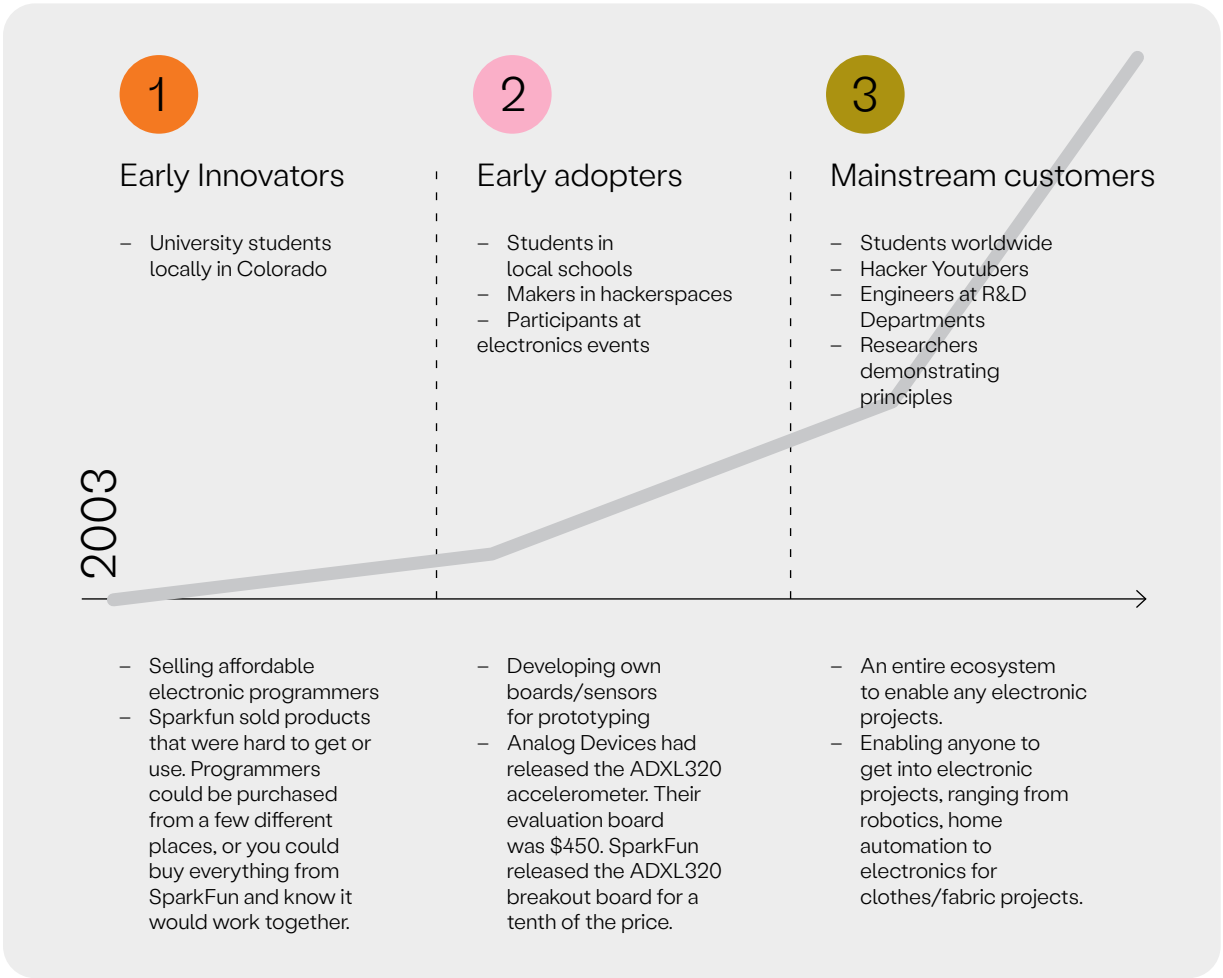
Helping people of all skill levels
Regardless of skill level, their open source components, resources, and online tutorials are designed to broaden access to innovative technology and make the road to a finished project shorter.

Scaling from humble beginnings
SparkFun has scaled dramatically, yet in an organic way. It went from one guy mailing boxes out of a basement to 140 employees in an 80,000-square-foot building.



SparkFun microSD / TransFlash breakout, SparkFun Electronics, CC BY 2.0, via Wikimedia Commons

How have their offerings evolved over time?



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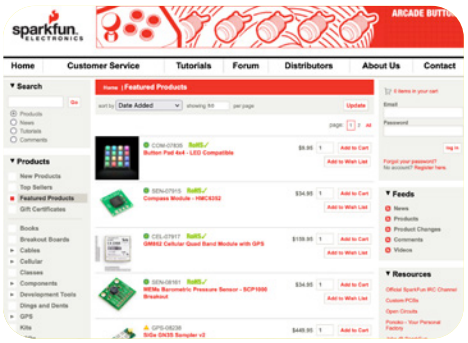

Early Innovators

SparkFun webshop for electronics (2011). ©SparkFun, web.archive.org

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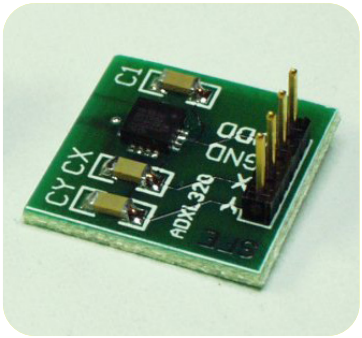

Early adopters

SparkFun ADXL320 breakout board (2004), SparkFun Electronics, CC BY 2.0, via sparkfun.com

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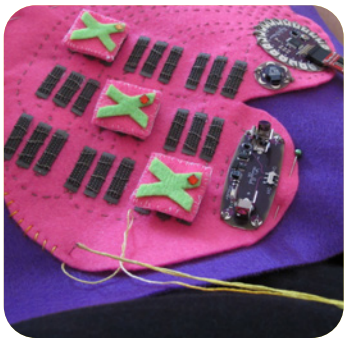
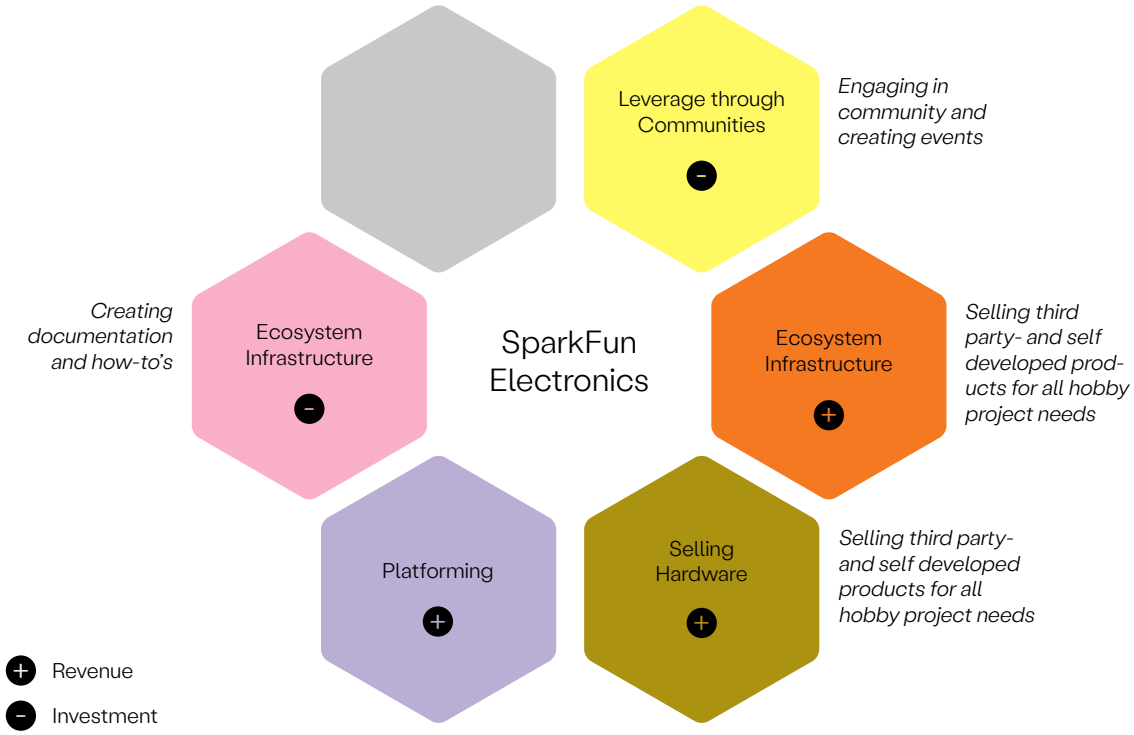


Mainstream customers

0s & Xs game for LilyPad Arduino using conductive velcro Rain Rabbit, CC BY-NC 2.0, via Flickr

What are their Strategic Approaches?



What motivates the customer?

1 Early Innovators

Online one-stop-shop platform/webstore for hard to come by parts.

Detailed documentation of how to use the products.

2 Early adopters

Convenient online one-stop-shop platform/ webstore for everything you need to prototype.

Breakout boards developed by SparkFun at a fraction of the cost of most alternatives.

Open license + crowdfund-ing empowers customers to have a say in new product development and launches.

3 Mainstream customers

Extensive online one-stop-shop platform/ webstore.

Complete product kits and specific categories to create any project.

Massive community forum board for peer-to-peer support, intriguing events and competitions that engage.

Now it's your turn!

If you haven't already, download the template from the ddc.dk to begin your own open-source hardware journey.

Learn more
www.opennext.eu

This project is funded by the European Union's Horizon 2020 programme for research and innovation under grant agreement no. 869984