

# CS 4530: Fundamentals of Software Engineering

## Module 6, Lesson 4

### Organizing Humans to Build Software

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# Top-Down and Bottom-Up Organization

Eric S Raymond's 1997 essay compares software development methodologies as a “cathedral” or “bazaar”

- Many “free software” projects are designed top-down
- Prototypical “bazaar” example was Linux development, bottom-up and over the internet



# Top-Down and Bottom-Up Organization

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mongoose

## [python-committers] Transfer of power

Guido van Rossum | Thu, 12 Jul 2018 07:59:19 -0700

Now that PEP 572 is done, I don't ever want to have to fight so hard for a PEP and find that so many people despise my decisions.

I would like to remove myself entirely from the decision process. I'll still be there for a while as an ordinary core dev, and I'll still be available to mentor people -- possibly more available. But I'm basically giving myself a permanent vacation from being BDFL, and you all will be on your own.

After all that's eventually going to happen regardless -- there's still that bus lurking around the corner, and I'm not getting younger... (I'll spare you the list of medical issues.)

I am not going to appoint a successor.

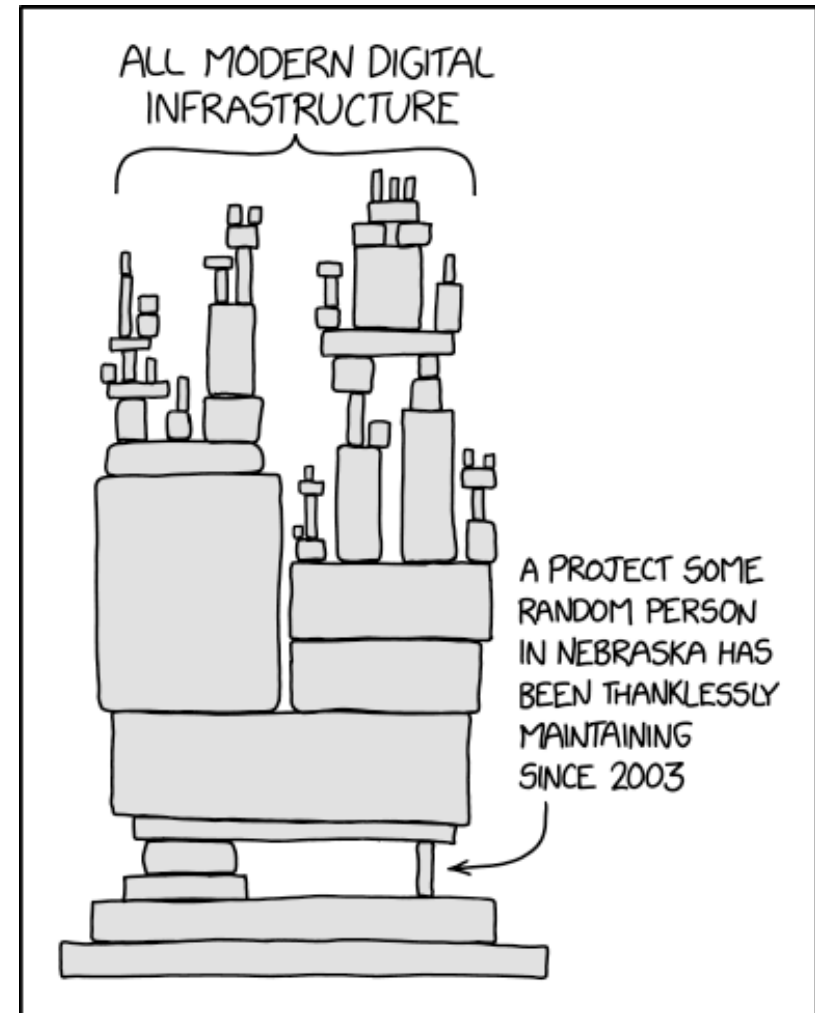
# Successful OSS have strong communities

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- OS projects thrive when community surrounding them contributes to push the project forward
- Communities form around collective ownership (even if it's only perceived)
- Contributors bring more than code: also documentation, support, and outreach
- Community/ownership models:
  - Corporate owner, community outreach/involvement (MySQL, MongoDB)
  - Foundation owner, corporate sponsors (GNU, Linux)

# Open Source Software Creates Value

- ...who gets to profit off of that value?
- ...how does everyone else live?



# “Open Source as a Utility” is a common model

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- The largest, most successful open source projects implement utility infrastructure:
  - Operating systems, web servers, logging libraries, programming languages
  - Business model: build and sell products and services using those utilities, contribute improvements back to the ecosystem
    - Linux, Kubernetes, React, etc.
  - Many companies provide specialized distributions of these open source infrastructure and specialized tools to improve them; support upstream project



**Red Hat**



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# Cloud services make this easier... and harder

- Many companies offer PaaS/SaaS hosted versions of their OS offerings to pay for continued development.
- But AWS can easily undersell those people... but long-term is reliant on them!

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# Monetize OSS by offering title insurance

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- SQLite is an extremely popular database library, in the public domain (copyright is waived)
- To have legal proof that the code is in the public domain (traceable links from code to waivers of copyright), you pay money





# Monetize OSS with “open core, closed plugins”

- Model: core component of product is open source; plugins for a fee
- Example: Apache Kafka, a distributed message broker (glue in event-based system)
  - Product is open source, maintained by Apache foundation, supported by a company
  - Confluent provides plugins to connect Kafka to different systems out-of-the-box



[Screenshot: “Apache Kafka vs Confluent”]

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## webpack

COLLECTIVE

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Fiscal Host: Open Source Collective

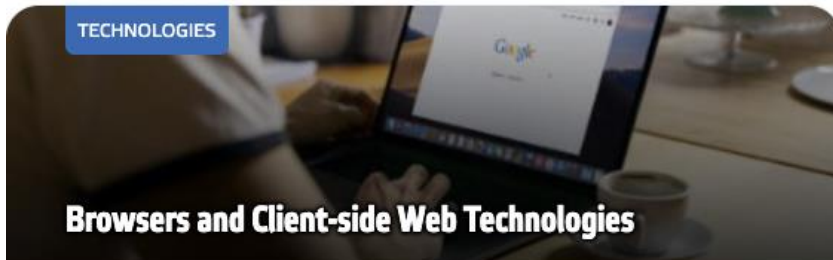
webpack is THE build solution for modern web applications.

# Open-source development for hire

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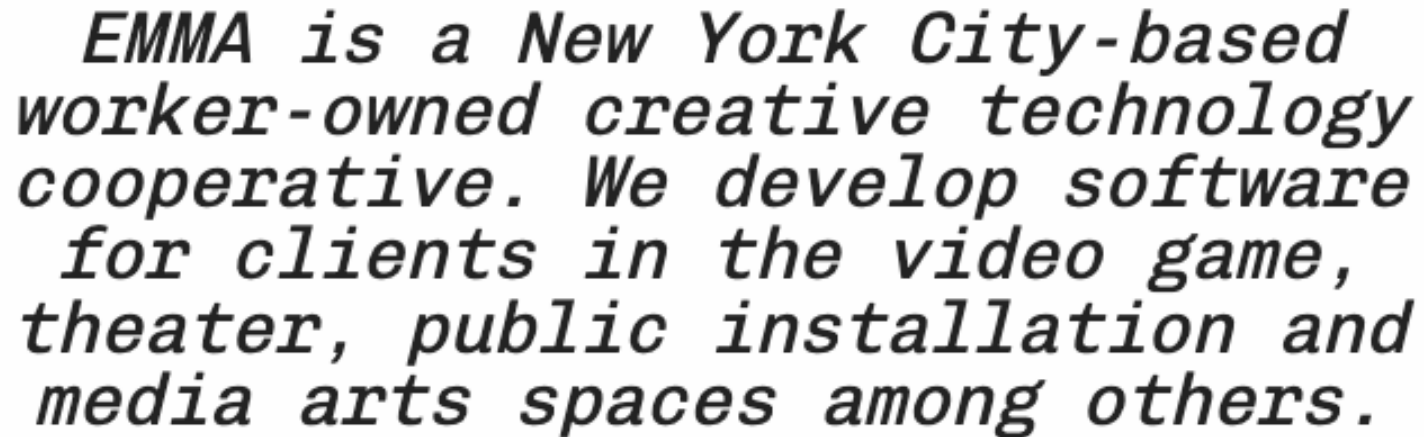
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# How do we pay people to build other kinds of software?

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