Guiding Principles of Great Web APIs

Mike Amundsen
@mamund


Mike Amundsen
@mamund

mamund.substack.com

Work

Signals from Our Futures Past

Dashboard

Home Notes Archive About

Robots, Before They Were Robots

Before Hollywood, before Boston Dynamics, robots were about labor, not lasers.

JUL 28 • MIKE AMUNDSEN

Most Popular

VIEW ALL

Structural Design for APIs

MAR 18, 2021 • MIKE AMUNDSEN

What is ALPS?

JAN 29, 2024 • MIKE AMUNDSEN

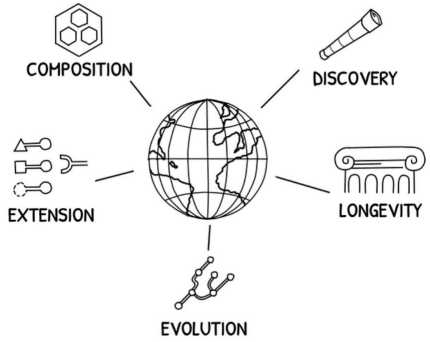
Toward a universal linked information system.

AUG 6, 2024 • MIKE AMUNDSEN

https://mamund.substack.com

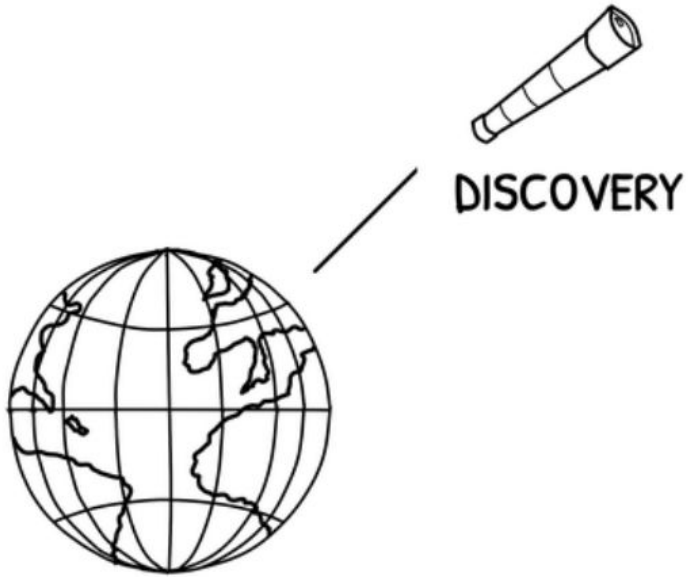
"The best APIs aren’t written for who you know, they’re written for who you don’t."

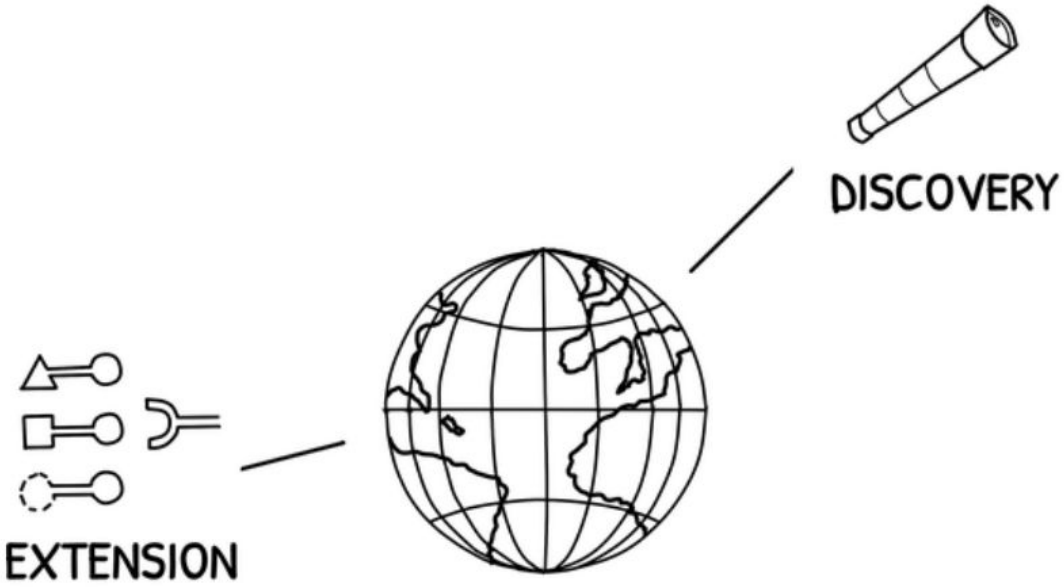
The Best APIs …

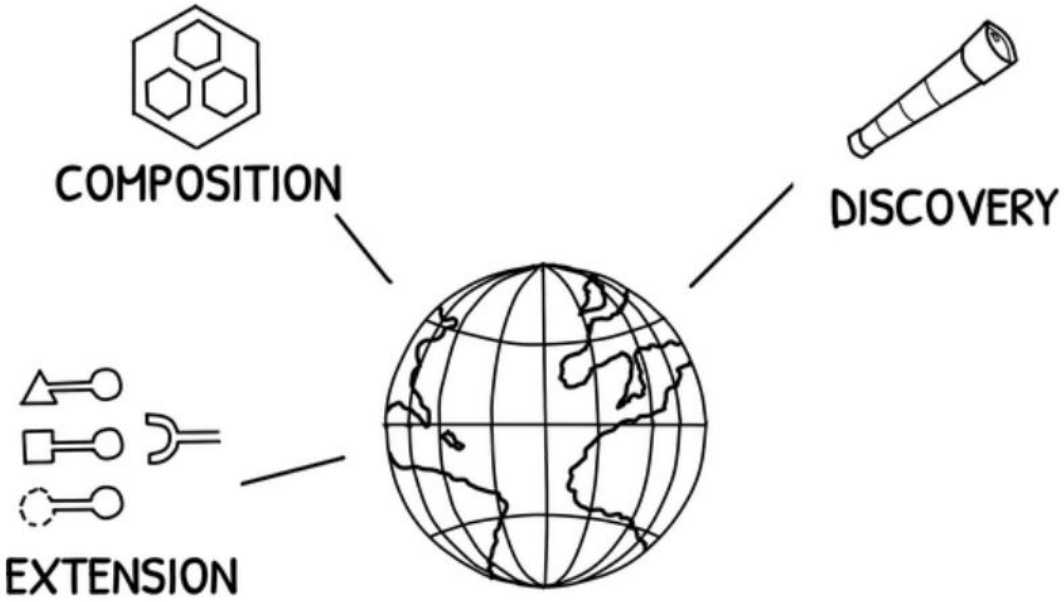


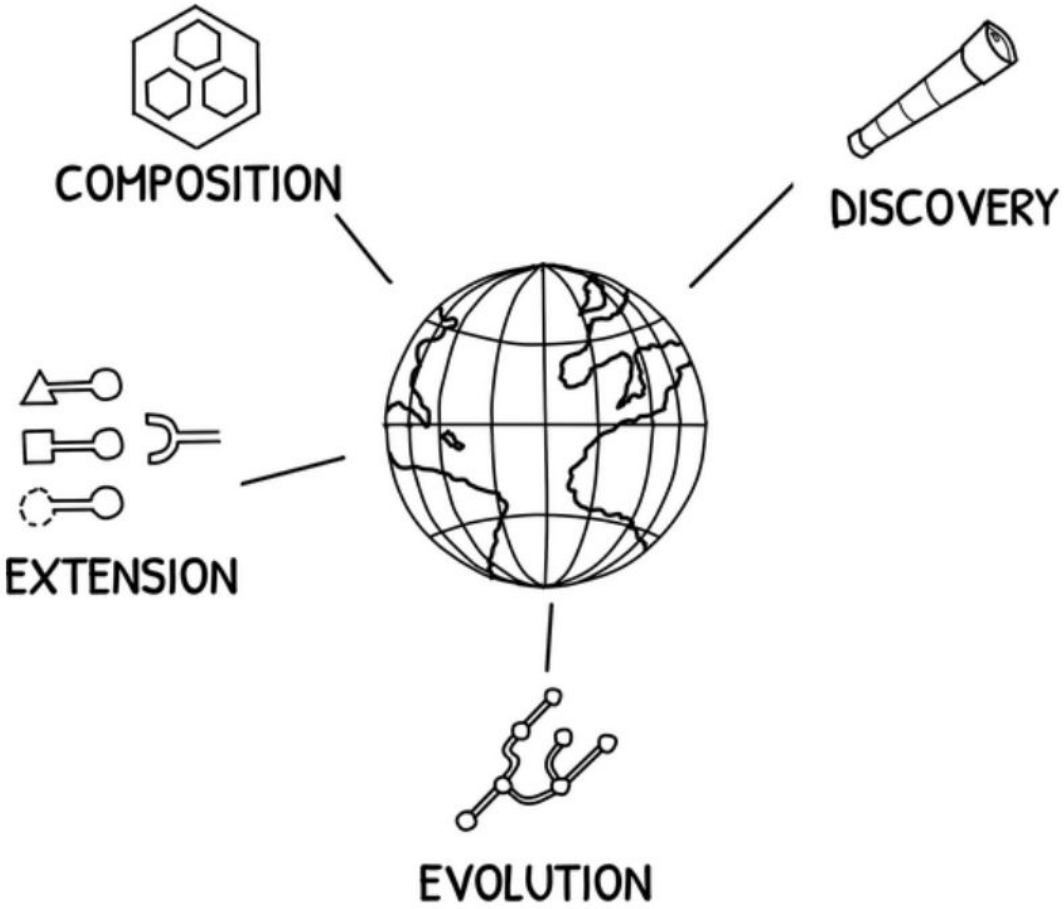
- Aim for
  - Global reach, adaptability, and long-term sustainability
- Build on
  - Decentralization, open-ended growth, and emergent complexity
- Move beyond
  - Rigid, brittle interfaces toward resilient, self-adapting ecosystems

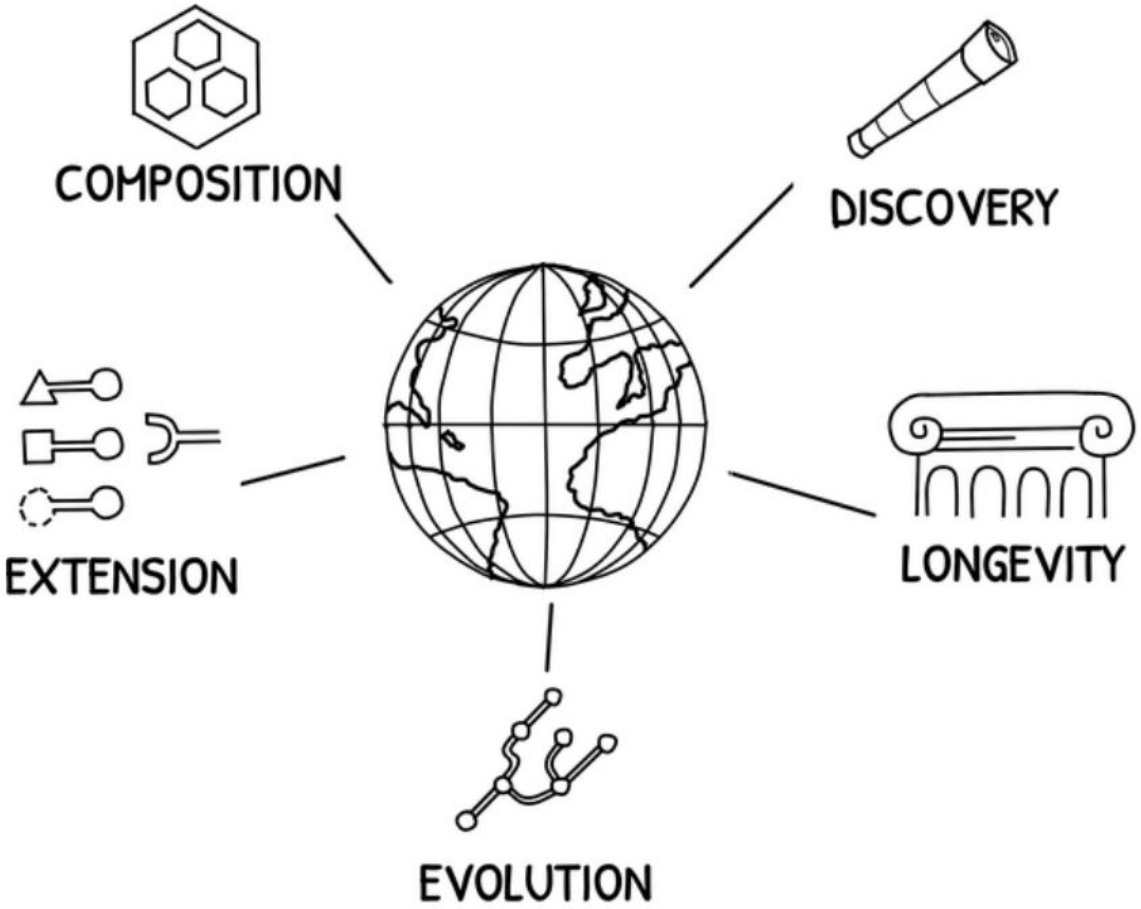
But how do we actually do that?


DISCOVERY


DISCOVERY
EXTENSION


COMPOSITION
DISCOVERY
EXTENSION


COMPOSITION
DISCOVERY
EXTENSION
EVOLUTION


COMPOSITION
DISCOVERY
EXTENSION
LONGEVITY
EVOLUTION

Discovery -- *Findability and Reusability*

Discovery -- *Findability and Reusability*

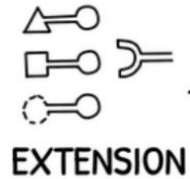
- APIs should be self-descriptive and discoverable
- Enable dynamic use without prior coordination
- Leverage hypermedia, affordances, and metadata

Good designs increase our global reach; the ability to share our solutions and to find and use the solutions of others.

Peter Morville: pioneer of information architecture and author of *Ambient Findability* & *Information Architecture*

Extension -- *Unanticipated Uses & Flexibility*

Extension -- *Unanticipated Uses & Flexibility*

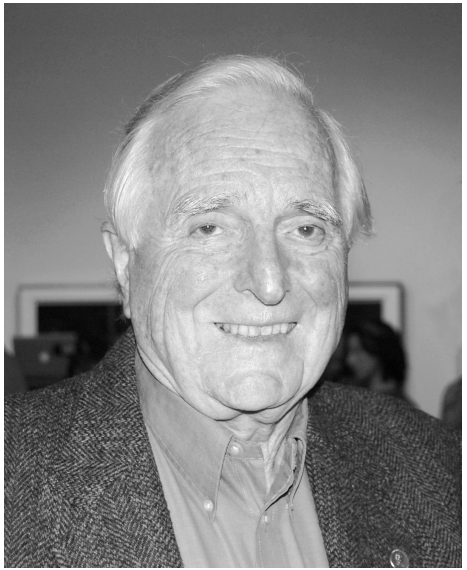


- Design for unexpected use
- APIs provide affordances, not just fixed endpoints
- Inspired by generativity of systems like the Web or Unix pipes

Good designs make well-designed services available for others to use in ways we haven't thought of yet.

Christopher Alexander: architect who created the idea of "pattern languages," inspiring design thinking in software and beyond. Author of *The Timeless Way of Building*

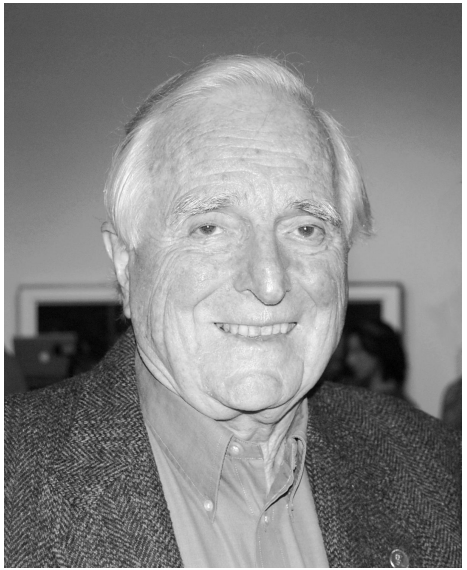
Composition -- *Interoperability & Loose Coupling*



Composition -- *Interoperability & Loose Coupling*

- Promote modularity & safe collaboration
- APIs should act like building blocks, tools
- Inspired by *stigmergy*: independent actors leaving signals for others

Good designs make it possible for "strangers" (services and/or people) to safely and successfully interact with each other to solve a problem.



Douglas Engelbart: visionary behind the "Mother of All Demos," inventor of the mouse, champion of using tech to augment human intellect

Evolution -- *Resilience & Adaptation Over Time*

Evolution -- *Resilience & Adaptation Over Time*

- APIs should be designed for runtime adaptation, not just big version jumps
- Enable systems to adjust on the fly through configuration, negotiation, or hypermedia-driven workflows
- Build with feedback loops that let clients and services learn and respond dynamically

Good designs promote independent evolution on a scale of decades.

Donella Meadows: systems theorist and author of *Thinking in Systems* (a foundational text on how complex systems grow and adapt)

Longevity -- Sustainability & Adaptability

Longevity -- Sustainability & Adaptability

- APIs must survive beyond individual implementations
- REST's constraints allow for long-term stability
- Design for sustainable, evolving interactions (not fixed schemas)

Good designs recognize that nothing is permanent and things will always change over time.

Roy Fielding: author of the dissertation that defines REST, whose principles laid the foundation for today's web architecture

What ties these five principles together?

Leverage global reach

Leverage global reach
to help people you have never met

Leverage global reach
to help people you have never met
solve problems you have not thought of.

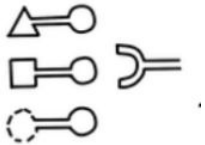
The Guiding Mantra

- Leverage global reach
  - Design with **Discovery** in mind so APIs can be found and used anywhere

The Guiding Mantra

- Leverage global reach
  - Design with **Discovery** in mind so APIs can be found and used anywhere
- Help people you have never met
  - Support **Extension**, letting others create uses you never planned

DISCOVERY

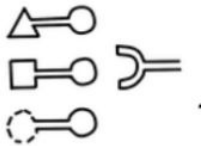


EXTENSION

The Guiding Mantra

- Leverage global reach
  - Design with **Discovery** in mind so APIs can be found and used anywhere
- Help people you have never met
  - Support **Extension**, letting others create uses you never planned
- Solve problems you have not thought of
  - Support **Composition** by enabling new combinations of building blocks

DISCOVERY

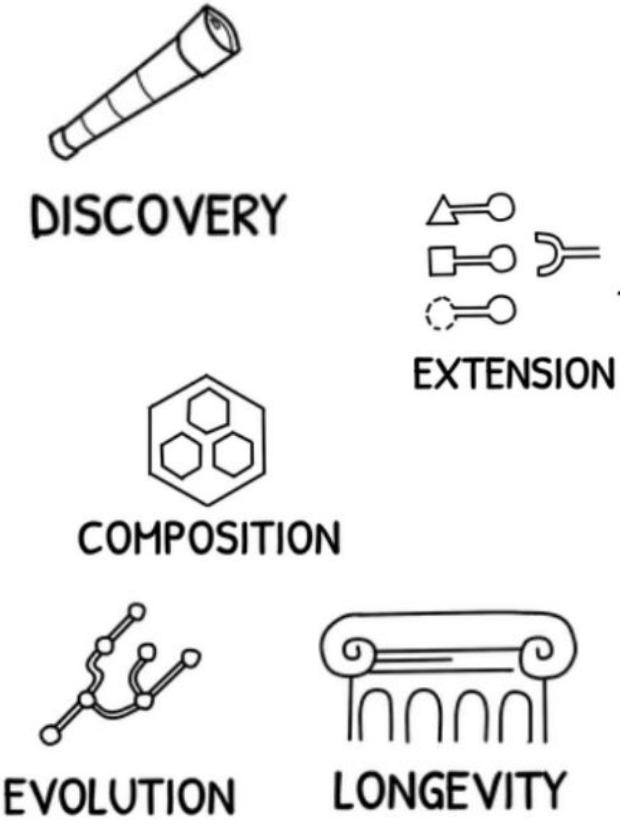


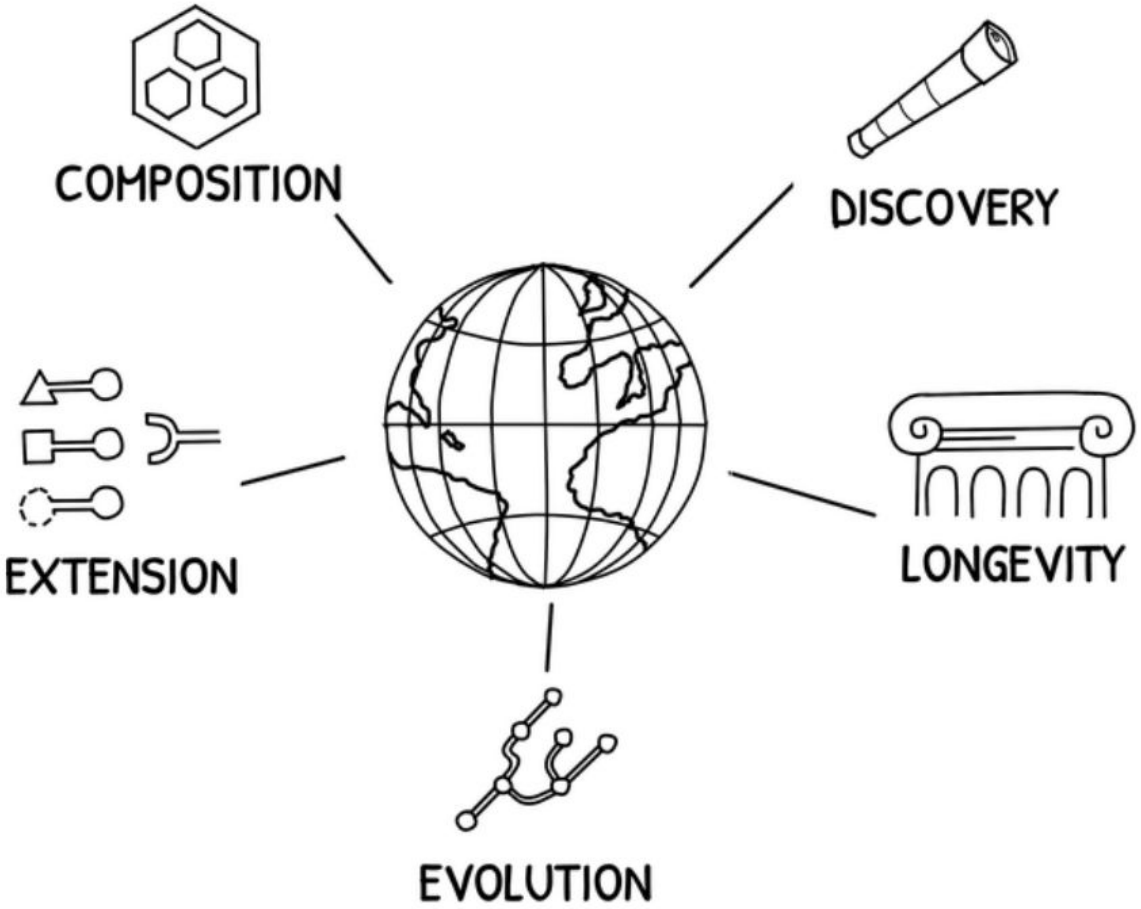
EXTENSION

COMPOSITION

The Guiding Mantra

- Leverage global reach
  - Design with **Discovery** in mind so APIs can be found and used anywhere
- Help people you have never met
  - Support **Extension**, letting others create uses you never planned
- Solve problems you have not thought of
  - Support **Composition** by enabling new combinations of building blocks
- Over time
  - Enable **Evolution** and **Longevity**: your API grows and adapts along with those new uses




COMPOSITION
DISCOVERY
EXTENSION
LONGEVITY
EVOLUTION

One more thing …

Alan Kay: computer scientist, pioneer of object-oriented programming and the personal computer.

"The best way to predict the future is to create it."

-- Alan Kay

Alan Kay: computer scientist, pioneer of object-oriented programming and the personal computer.

Guiding Principles of Great Web APIs

Mike Amundsen
@mamund

Guiding Principles of Great Web APIs

Mike Amundsen
@mamund