

# The Democratization of Databases

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Democratic governments have a long history of success, with some setbacks. This talk explains how democratic principles underpin the success of the open source relational database Postgres.

*<https://momjian.us/presentations>*



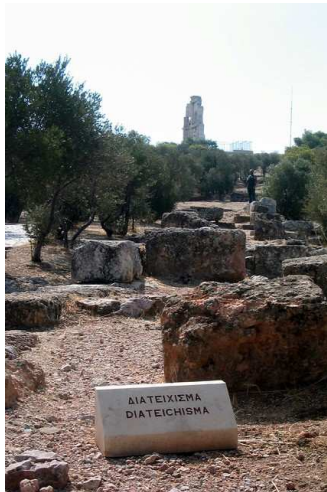
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*Last updated: February 2025*

# Outline

1. History of governance structures
2. Strengths of each structure
3. Efficiency and messiness of democracy
4. Ultimate success of democracy
5. Software governance history
6. Where does this leave Postgres?
7. Democracy in action

# 1. History of Governance Structures



Pnyx Hill, Athens

<https://www.flickr.com/photos/wallyg/>

# Autocracy

- Single person or small group in power
- Examples
  - dictatorship, e.g., Syria
  - absolute monarchy, e.g., Saudi Arabia
  - communist, e.g., North Korea
- First governing structure

# Representative Democracy

- First established in ancient Athens
- Historically only a small group of the population could vote
- Elect representatives to vote on issues

## 2. Strengths of Each Structure



Chepstow Castle, Wales

<https://www.flickr.com/photos/damiavos/>

# Autocracy Strengths

- Good for focusing a fixed amount of resources on a clear goal
- Examples
  - space exploration
  - military

# Democracy Strengths

- Allows rapid adjustment for unclear goals
- Emboldens talent to act near the problem
- Expands the pool of talent
- Examples
  - consumer goods
  - software



### 3. Efficiency and Messiness of Democracy



Madison, Wisconsin

<https://www.flickr.com/photos/dennisdeery/>

# Efficiency of Democracy

- Unleashes a flurry of activity based on agency, i.e., personal power
- Fluidity of solutions

# Messiness of Democracy

- Hard to predict behavior
- Problems can get stuck
- Difficulty with large projects that span multiple elections
- Direct democracy rarely tried, yielded mixed results

## 4. Ultimate Success of Democracy



Moscow

<https://www.flickr.com/photos/varfolomeev/>

# Democracy's Checkered History

- First democracy in Athens, suspended during wars
- Roman democracy ended in dictatorship
- Middle Ages, Magna Carta, Renaissance
- American Revolution, black and women's voting rights
- French Revolution leads to monarchy

# Democracy Today

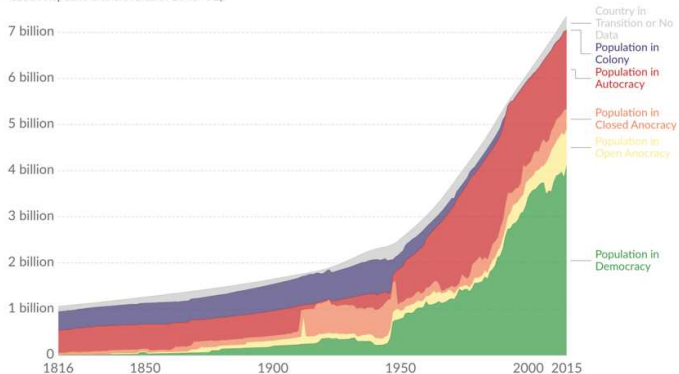
- Democracy continues to make steady progress
- There are still setbacks

# Democracy in the Past 200 Years

<https://www.flickr.com/photos/dennisdeery/>

## Number of world citizens living under different political regimes

The scale goes from -10 (full autocracy) to 10 (full democracy). Anocracies are those scoring between -5 and 5. "Colony" (coded as -20) includes not only colonies, but also countries that were not yet sovereign states (e.g. the Czech Republic and Slovakia in 1945–92).



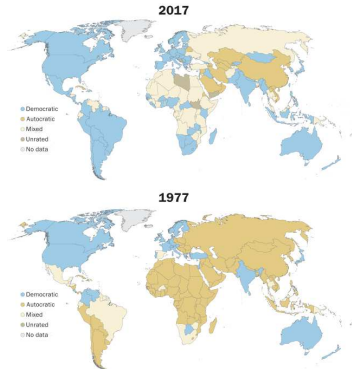
Source: World Population by Political Regime they live in (OWID (2016))  
[OurWorldInData.org/a-history-of-global-living-conditions-in-5-charts/](https://ourworldindata.org/a-history-of-global-living-conditions-in-5-charts/) • CC BY

<https://ourworldindata.org/democracy>

# Democracy in the Past 40 Years

## Democracy has grown across the world over the past four decades

Regime types in each country, 1977 and 2017



Note: Map depicts data for the 167 countries included in the Polity IV database. Countries labeled "mixed" have a blend of democratic and autocratic regime characteristics. "Unrated" countries are those whose central government has or had completely collapsed, which are or were subject to foreign intervention or occupation, or which are or were in the midst of a regime transition. "No data" refers to states or entities that either have fewer than 500,000 people or are not internationally recognized as fully sovereign.

Source: Center for Systemic Peace's Polity IV Project.

PEW RESEARCH CENTER

<https://www.pewresearch.org/fact-tank/2019/05/14/more-than-half-of-countries-are-democratic/>



## 5. Software Governance History



Redwood City, California

<https://www.flickr.com/photos/nzdave/>

# Proprietary Autocracy

- Executives make decisions
  - input from sales and marketing
  - indirectly from customers
- Decision matrix
  - “If we do this, what percentage of customers will we gain?”
  - “If we don’t, what percentage of customers will we lose?”
  - gains are more sensitive to the decision than losses
  - “Do gains or avoided losses justify the implementation costs?”

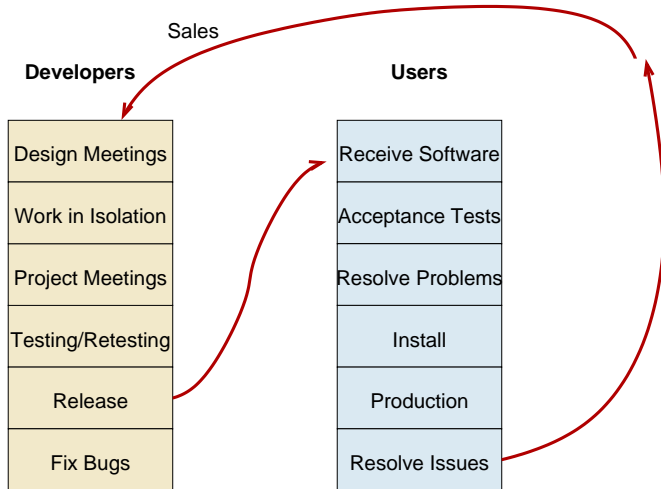
# Open Source Democracy

- Mix of direct democracy and meritocracy
- Voting can be problematic
- Sometimes too much feedback
  - bike shedding
- Bad decisions can be quickly corrected, i.e., easy to revert
- No reliable road map

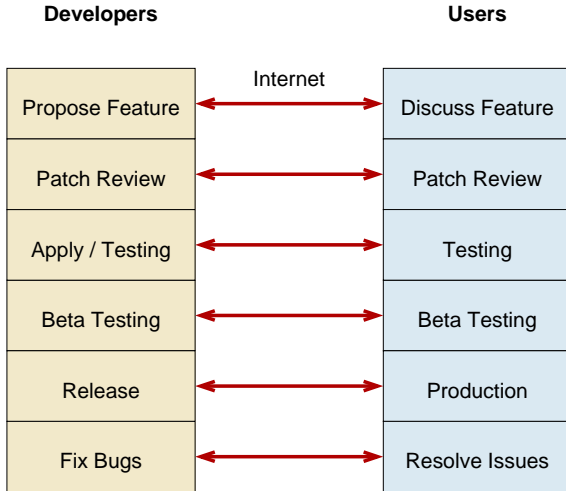
# Internet Makes Direct Democracy Possible

- Easy to share ideas and iterate new solutions
- Rapid global communication

# Autocratic Development Flow



# Democratic Development Flow



# Hybrid Development Models

- Single company controls development
- Open source distribution
- Uses autocratic decision matrix
- Lacks democratic feedback
- More comfortable for users transitioning from proprietary since there is a single company to contact
- Examples
  - MySQL, MariaDB
  - MongoDB

## 6. Where Does This Leave Postgres?



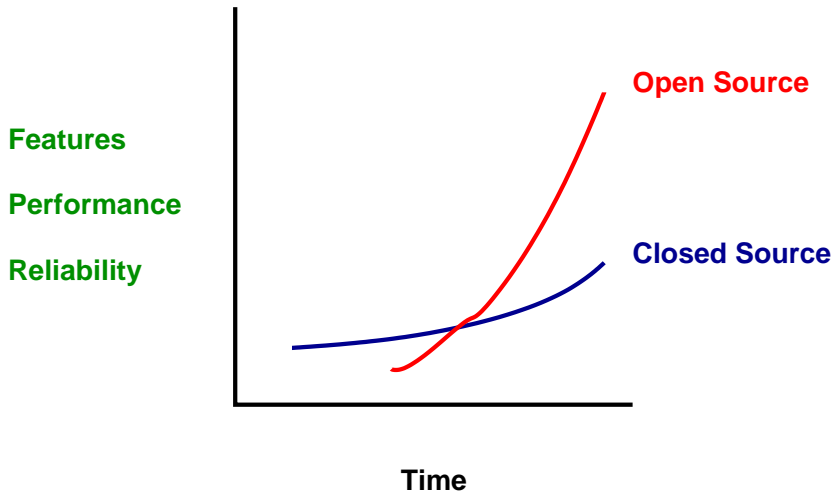
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# Postgres Wins Because Democracy Wins

- Uses democracy to attract talent
  - talent pool can easily compete with proprietary staff
- Superior feedback and decision matrix lead to success
- This is a challenge for niche software
- Setbacks still possible

# Rise of Open Source

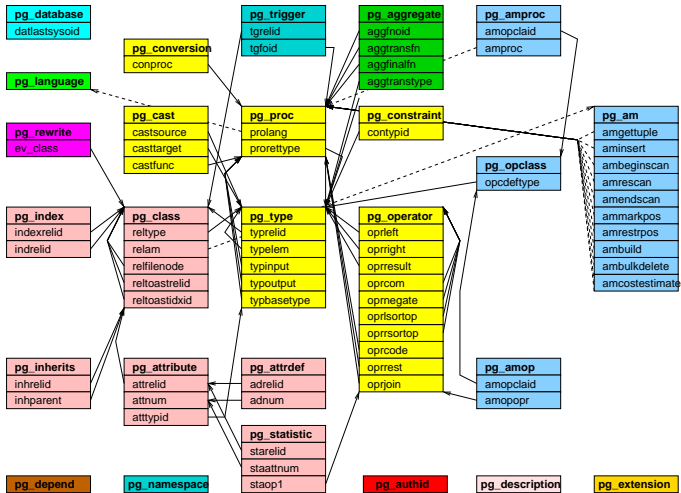


## 7. Democracy in Action

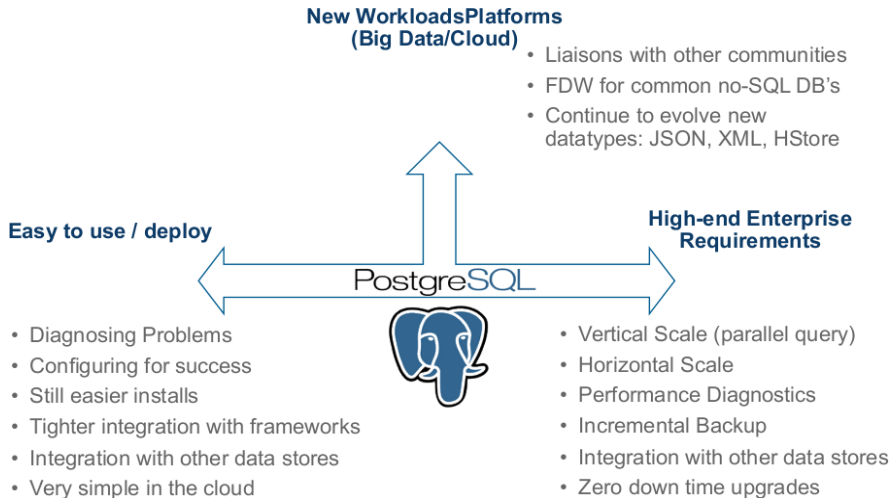


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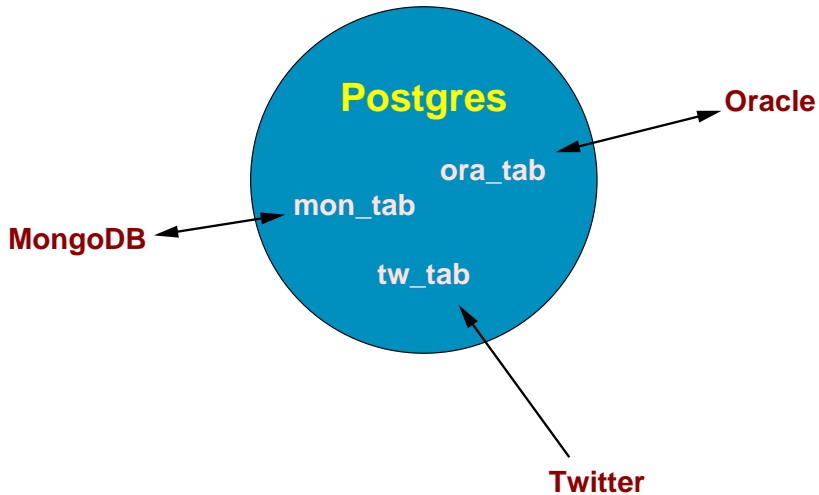
# Postgres Extensibility



# Many Focuses



# Foreign Data Wrappers



# Foreign Data Wrappers

- 100+ interfaces to foreign data
- Read/write
- Sophisticated push down of joins, sorts, and aggregates



users tags recent

in Distributions PGXN Search

acl administration **aggregate**  
aggregate function analytics arithmetic array arrays audit  
auditing compatibility count custom background worker  
data type datatype dictionary distinct estimate  
example extension external data **fdw**  
**foreign data wrapper**  
function functions hash hint index  
json jsonb log logging maintenance  
math md5 mean median meta mongodb  
monitoring partitioning performance  
plan plpgsql postgresql replication search  
sql sql med statistics table template testing  
trigger types utilities

PGXN, the PostgreSQL Extension network, is a central distribution system for open-source PostgreSQL extension libraries.

### Recent Releases

#### pg\_task 2.1.16

PostgreSQL and Greenplum job scheduler pg\_task allows to execute any sql command at any specific time at background asynchronously

#### pg\_mustach 1.0.16

PostgreSQL mustach

#### uint128 1.0.1

Unsigned integer datatypes for PostgreSQL

#### pgsql\_tweaks 0.11.1

Contains PostgreSQL functions which I regularly needed.

#### jsonschema 0.1.6

JSON Schema validation functions for PostgreSQL



- PostGIS is a full-featured Geographical Information System (GIS)
- Implemented as a extension
- Independent development team and community



# PostgreSQL Tenth Anniversary in 2006



[https://www.postgresql.org/files/community/conference06/conference\\_group.html](https://www.postgresql.org/files/community/conference06/conference_group.html)

# My Postgres Activities



# Voting

- Committers nominate new committers
- Core team nominates new core members
- Development is open to all, even occasional visitors
  - “Let the best idea win!”
  - “Where did that guy come from?”
  - Focus talent like a lens on every task

# Roadmap

- Individuals and political parties have roadmaps
- Democratic governments don't
- Developers and companies have roadmaps
- Postgres doesn't

### Users

- General Re: Moving from Linux to Linux?
- Other Re: Query result differences between PostgreSQL 17 vs 16
- Announce Postgres Extensions Day 2025: Registration and Call for Speakers

### Developers

- Hackers Re: [BUG?] check\_exclusion\_or\_unique\_constraint false negative
- Commit Assert that a snapshot is active or registered before it's used
- Versions **Stable:** 17.4+, 16.8+, 15.12+, 14.17+, 13.20+ | **Development:** 18 devel, in commitfest

### External

- Blogs Hubert 'depesz' Lubaczewski: Waiting for PostgreSQL 18 – Allow parallel CREATE INDEX for GIN indexes
- News Postgres Extensions Day 2025: Registration and Call for Speakers
- Media pgEdge, Inc. Secures Strategic Investments from Akamai and QRT, Strengthening the Future of Distributed PostgreSQL for High Availability and Edge Computing - PR Newswire
- Events FOSSASIA PGDay 2025

### IRC (also Slack)

- wfpkhc:** **wfpkhc** wanders over and sits on the couch after waving hello to everyone in chat\*
- wfpkhc:** along time ago on a computer far far away - a young person sat at a keyboard with a "sams teach yourself X book" about different topics -
- wfpkhc:** and that young person that is now an old person, is wondering if there is any book like those that teach postgresql admin and implementation?
- wfpkhc:** **wfpkhc** takes a sip of hot chocolate from extra large mug\*
- wfpkhc:** <https://i.imgur.com/4nSgY3C.jpeg>
- wfpkhc:** **wfpkhc** sits quietly and sighs\*
- wfpkhc:** ill come back another time
- wfpkhc:** **wfpkhc** stands up and taps my comm badge and transporter beams out of chat\*

London 01:20 Berlin 02:20 Moscow 04:20 Mumbai 06:50 Beijing 09:20 Tokyo 10:20 Los Angeles 18:20 New York 21:20 São Paulo 22:20

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# Conclusion



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